United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Louisiana Agricultural
Experiment Station and
Louisiana Soil and Water
Conservation Committee

Soil Survey of Union Parish, Louisiana

How To Use This Soil Survey

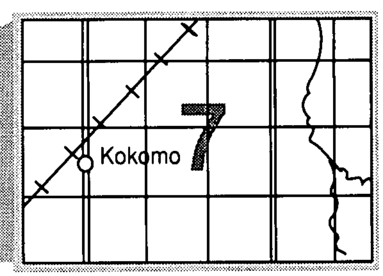
General Soil Map

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

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

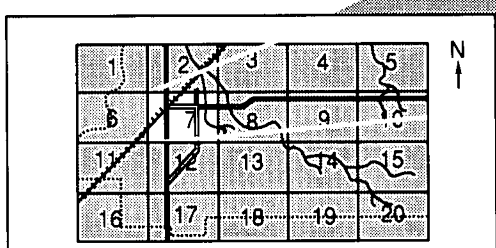
Detailed Soil Maps

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



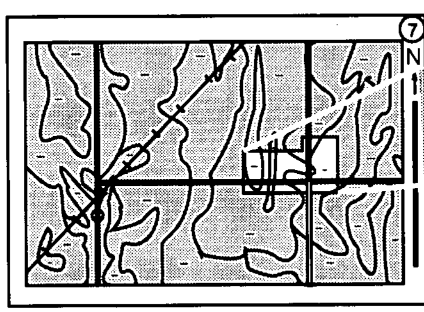
MAP SHEET

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

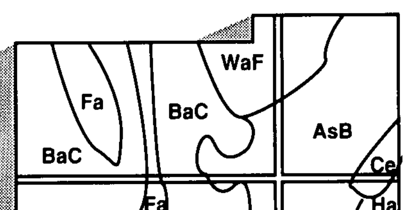


INDEX TO MAP SHEETS

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



MAP SHEET



AREA OF INTEREST

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

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

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1991. Soil names and descriptions were approved in 1992. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1991. This soil survey was made cooperatively by the Natural Resources Conservation Service, the Louisiana Agricultural Experiment Station, and the Louisiana Soil and Water Conservation Committee. It is part of the technical assistance furnished to the D'Arbonne 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.

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

Cover: A pasture and small pond in an area of Kirvin fine sandy loam, 1 to 5 percent slopes.

Contents

Issued November 1997

Summary of Tables

Foreword

This soil survey contains information that can be used in land-planning programs in Union Parish. 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 ensure 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 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 Natural Resources Conservation Service or the Cooperative Extension Service.

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Soil Survey of
Union Parish, Louisiana

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United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the Louisiana Agricultural Experiment Station and the Louisiana Soil and Water Conservation Committee

Union Parish is in north-central Louisiana (fig. 1). The total area is 578,900 acres, of which 562,700 acres is land and 16,200 acres is water in the form of lakes, reservoirs, streams, and other waterways. Union Parish is bordered on the north by Arkansas. The Ouachita River and Morehouse Parish form the eastern boundary of the parish. Union Parish is bordered on the south by Ouachita and Lincoln Parishes. Claiborne Parish borders Union Parish on the west.

The parish is mainly rural and had a population of 20,690 in 1990. Farmerville is the largest city and the parish seat. It has a population of 3,334.

The three major physiographic areas that make up the parish are the level to gently undulating alluvial plains, the level to moderately steep uplands, and the level to strongly sloping low and high terraces. Elevation ranges from about 285 feet above sea level in the uplands west of Oakland, to about 50 feet on the flood plains of the Ouachita River in the northeastern part of the parish.

The alluvial plains make up about 23 percent of the parish. They consist of loamy or clayey soils that range from well drained to poorly drained. These soils are low or medium in fertility. Most of the acreage is woodland. A small acreage is used as cropland, homesites, or pastureland. The soils on the natural levees are mostly loamy. The soils between the natural levees are clayey or loamy.

The uplands make up about 59 percent of the parish. They consist of loamy and sandy soils. These soils are generally low in natural fertility. Most of the acreage is woodland. A small acreage is used as pastureland, homesites, or cropland.

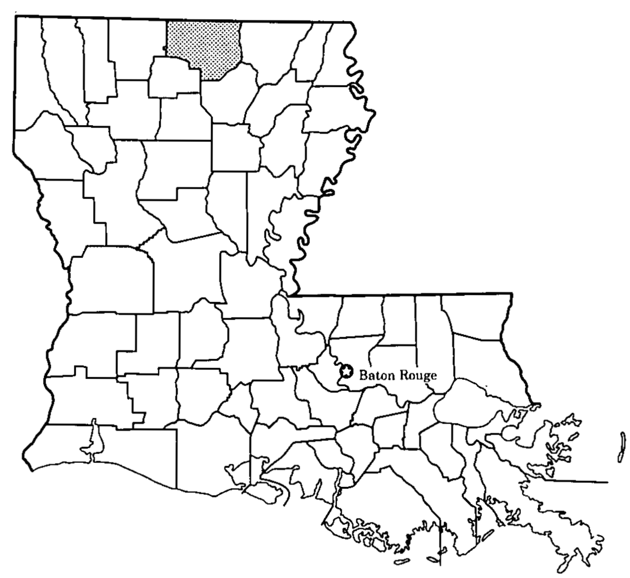

Figure 1.—Location of Union Parish in Louisiana.

The low and high terraces make up the remaining 18 percent of the parish. The soils on these terraces are mainly loamy or sandy. They are low in natural fertility. Most of the acreage is woodland. A small acreage is used as cropland, pastureland, or homesites.

General Nature of the Parish

This section gives general information concerning the climate, history and development, agriculture, transportation, industry, and water resources of the parish.

Climate

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

Table 1 gives data on temperature and precipitation for the survey area as recorded at Bastrop in the period 1949 to 1987. 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 48 degrees F and the average daily minimum temperature is 38 degrees. The lowest temperature on record, which occurred at Bastrop on January 12, 1962, is 4 degrees. In summer, the average temperature is 82 degrees and the average daily maximum temperature is 93 degrees. The highest recorded temperature, which occurred at Bastrop on September 5, 1951, is 110 degrees.

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

The total annual precipitation is 53 inches. Of this, 24.92 inches, or 47 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 2.7 inches. The heaviest 1-day rainfall during the period of record was 6 inches at Bastrop on May 1, 1954. Thunderstorms occur on about 60 days each year, and most occur in summer.

Snowfall is rare. In 60 percent of the winters, there is no measurable snowfall. In 15 percent, the snowfall, usually of short duration, is more than 2 inches. The heaviest 1-day snowfall on record was more than 5 inches.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 10 miles per hour, in spring.

History and Development

Union Parish was established as a political unit in 1839, when it and 19 other parishes were formed from the Territory of Orleans. The first recorded settlement was Loch Lomond, which was along the west bank of the Ouachita River, about 3.5 miles southwest of Sterlington, Louisiana.

The early settlers in the area were mainly farmers who were poor and devoutly religious. Farms were small and the soils were generally poor. In 1844, settlers built the Male and Female Academy, the first school in the parish. Later, the name of the school was changed to Farmerville High School.

Farmerville, the parish seat, was named after a prominent resident of Union Parish, W. W. Farmer, who was an early lieutenant governor of Louisiana. Other incorporated towns in the parish are Bernice, Marion, Junction City, and Spearsville.

Agriculture

Agriculture is important to Union Parish. Before about 1950, cotton was the main cash crop. Much of the cropland has since been converted to pine tree plantations and to pastureland.

In 1987, there were 457 farms in the parish. The average farm was about 143 acres and had a value of 1,174 dollars per acre. Total cropland and pastureland in Union Parish was 26,381 acres in 1987. The remaining acreage was mainly woodland. A small acreage was used as homesites, urban areas, or industrial sites.

In 1989, the main cultivated crops in the parish were cotton, corn, and hay. Small acreages were used to grow vegetables, fruit trees, and Christmas trees.

Raising livestock, poultry, alligators, and catfish also are important in Union Parish, but they are not major enterprises.

Land use in Union Parish is essentially stable. No major land use changes are foreseen.

Transportation

Union Parish has a large network of highways and roads. It is served by one major U.S. Highway and 11 state highways. The parish maintains the remaining hard surfaced and gravelled roads that provide access to rural areas. The parish also is served by one major railroad system that connects to every major railroad system in the United States. An airport serves small private and commercial aircraft. Commercial passenger and freight air service is also available in Monroe, Louisiana.

Industry

Union Parish has several diversified agricultural-related industries. The forestry and forest products industries are the mainstays of the economy. Forestry-related industries include chip mills, sawmills, and a specialty sawmill for hardwood timber only.

The poultry and cattle industries are also important in Union Parish. A poultry processing plant is planned near Farmerville.

Since oil and gas were first discovered near Monroe in the early 1900's, this industry has been important to the economy of Union Parish. About 5,600 active oil and gas wells are scattered throughout the parish.

Tourism is gaining importance in Union Parish. The parish has several excellent fishing lakes, streams, and rivers. Lake D'Arbonne covers about 15,250 acres and attracts avid fishermen and water enthusiasts. Finch Lake and the Ouachita River also are popular recreational areas. Several of the incorporated towns host annual festivals. Also, both Federal and State wildlife refuges in the parish attract hunters and other outdoorsmen.

Water Resources

Surface Water

The principal sources of surface water in Union Parish are the Ouachita River, Little Corney Bayou, Bayou D'Arbonne, and Bayou de Loutre.

Lake D'Arbonne has a surface area of 15,250 acres or 23.8 square miles. At full capacity, it contains 130,000 acre feet of water. The average flow rate for Little Corney Bayou is 194 cubic feet per second and 171 cubic feet per second for Bayou de Loutre. In contrast, the average flow rate of the Ouachita River is 17,600 cubic feet per second.

Generally, the quality of water in the lakes and streams of the parish is good. Although the Ouachita River, Bayou De Arbonne, and Bayou de Lourtre were previously polluted by oil field and industrial waste, pollution abatement programs have significantly improved the quality of these waters.

The surface water in Union Parish is mainly used for recreation. That part of the Ouachita River below Sterlington is also used for industrial purposes and transportation of cargo.

Ground Water

Union Parish has an abundant supply of ground water. The major ground water aquifers in the parish are the Ouachita River Alluvium Aquifer of Holocene age, the Upland and Terrace Deposits of Pleistocene age, and the Cockfield, Cook Mountain, and Sparta Sand Formations of Eocene age.

The Ouachita River Alluvium Aquifer underlies the valleys of the Ouachita River and its larger tributaries in the parish. The aquifer is less than 75 feet thick. Few wells are developed in the Ouachita River Alluvium Aquifer mainly because the Ouachita River Valley is frequently flooded.

The Upland and Terrace Deposits lie between Eocene and Holocene sediments in the eastern part of the parish. These deposits consist of silty clay, fine to very coarse sand, and gravel. These deposits are less than 70 feet thick. The water level in these deposits probably fluctuates seasonally. The aquifer in the Upland Terrace Deposits is a source of water for some rural wells.

In places, the Cockfield Formation is at or near the land surface. It is a source of water for shallow domestic wells. The Cockfield Formation is absent in the southern part of the parish where the Cook Mountain Formation outcrops. In the northeastern part of the parish the Cockfield Formation may be over 200 feet thick, however, the average thickness is about 80 feet. Most of the rural wells in the parish are in the Cockfield Formation and furnish an adequate amount of water for domestic and stock supplies.

The Cook Mountain Formation is immediately below the Cockfield Formation. This formation is predominantly glauconitic or lignitic silty clay with very fine sand and green silt. Thin layers of ferruginous siltstone and other hardened material occur throughout the formation. The thickness of the Cook Mountain Formation ranges from about 175 feet along the western edge of the parish to over 200 feet near the northeastern corner. This formation is a source of water for some domestic wells in the parish. The water is of the sodium bicarbonate type.

The Sparta Sand Formation occurs throughout the parish. It is the most significant water-bearing formation in the parish; however, because of the depth to this aquifer, usage is limited. The Sparta Sand Formation is a sequence of alternating clay and sand beds which lie between the massive clay beds of the underlying Cane River Formation and the overlying Cook Mountain Formation. The thickness ranges from about 500 feet in the northwestern part of the parish to about 650 feet in the southeastern part of the parish. The Sparta Sand Formation provides water to a few rural domestic wells; however, the pumpage is small. The Sparta Sand Formation is not utilized as a water source for irrigation or industrial uses in the parish. The water in the Sparta Sand Formation is generally of good quality and can be used for most purposes without treatment.

How This Survey Was Made

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

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

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

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

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

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

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

Map Unit Composition

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

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

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

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it 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 another but in a different pattern.

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

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

The soils in the survey area vary widely in their suitability for major land uses.

Each map unit is rated for *cultivated crops, pastureland, woodland, and urban uses.* Cultivated crops are those grown extensively in the survey area. Pastureland refers to pasture of native and improved grasses for livestock. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments.

The boundaries of the general soil map units in Union Parish were matched where possible with those of the previously published surveys of Claiborne, Morehouse, and Ouachita Parishes. In a few places, however, the names of the map units differ. These differences resulted mainly because of changes in soil series concepts, differences in map unit design, and changes in soil patterns near the survey area boundaries.

The general soil map units in this survey have been grouped into three general landscapes. Descriptions of each of the broad groups and the map units in each group follow.

Soils on Alluvial Plains

This group of map units consists of poorly drained to well drained, level and nearly level, clayey and loamy soils. The map units in this group make up about 23 percent of the parish. Most of the acreage is used as woodland. Wetness and the hazard of flooding are the main limitations for most uses.

1. Litro-Perry-Portland

This map unit consists of level and nearly level, poorly drained and somewhat poorly drained soils that are subject to occasional to frequent flooding. They are mainly on the flood plains of D'Arbonne Bayou and the Ouachita River. Flooding occurs mainly in winter and spring but it can occur during any season. Slopes range from 0 to 2 percent.

This map unit makes up about 5 percent of the parish. It is about 60 percent Litro soils, 18 percent Perry soils, 11 percent Portland soils, and 11 percent soils of minor extent.

The Litro soils are nearly level and poorly drained. They are subject to frequent flooding. These soils have a dark gray, mottled clay surface layer. The subsoil is dark gray and gray, mottled clay and silty clay.

The Perry soils are level and poorly drained. They are subject to frequent flooding. These soils have a dark gray, mottled clay surface layer. The subsoil is gray, mottled clay in the upper part and dark reddish brown clay in the lower part. The substratum is mottled gray and reddish brown clay in the upper part and dark reddish brown, mottled clay in the lower part.

The Portland soils are level and somewhat poorly drained. They are subject to occasional to frequent flooding. These soils have a dark grayish brown, mottled silty clay loam or grayish brown, mottled clay surface layer. The next layer is dark grayish brown, mottled silty clay. The subsoil is reddish brown clay. It is mottled in the upper and middle parts. The substratum is gray, mottled clay.

The minor soils in this map unit are Groom and Haggerty soils on low terraces and former beaches of relict lakes on the flood plain of the Ouachita River.

The soils in this map unit are used mainly as woodland. Small acreages are used as cropland or pastureland.

These soils are moderately well suited to produce hardwoods. Wetness from a seasonal high water table and flooding, however, severely limit the use of equipment during some seasons of the year and cause seedling mortality. Competition from unwanted understory plants is an additional concern.

The soils in this map unit that are subject to frequent flooding are not suited to cultivated crops. The soils that are subject to occasional flooding are poorly suited to cultivated crops. The main limitations are wetness, the hazard of flooding, and poor tilth.

The soils in this map unit that are subject to frequent flooding are poorly suited to use as pastureland. The soils that are subject to occasional flooding are moderately well suited to use as pastureland. Wetness and the hazard of flooding are the main management concerns.

These soils are poorly suited to urban and intensive recreational uses. The main limitations are wetness, the hazard of flooding, very slow permeability, and high shrink-swell potential.

2. Guyton-Iuka-Ochlockonee

This map unit consists of level and nearly level, poorly drained and moderately well drained soils on the narrow flood plains along streams that drain the uplands. Flooding is frequent and occurs mainly in winter and spring, but it can occur during any season. Slopes range from 0 to 2 percent.

This map unit makes up about 18 percent of the parish. It is about 49 percent Guyton soils, 28 percent Iuka soils, 19 percent Ochlockonee soils, and 4 percent soils of minor extent.

The Guyton soils are level and poorly drained. They are in low positions on flood plains. These soils have a dark grayish brown and dark brown silt loam surface layer. The subsurface layer is brown and light brownish gray, mottled silt loam. The next layer is light brownish gray, mottled silt loam and tongues of light gray silt loam. The subsoil is light brownish gray and light gray, mottled silty clay loam and silt loam.

The Iuka soils are level and moderately well drained. They are on flats and in low positions on natural levees. The surface layer is dark brown fine sandy loam. From top to bottom the layers of the underlying material are brown, mottled fine sandy loam; yellowish brown, mottled loam; mottled yellowish brown and light brownish gray fine sandy loam; light brownish gray, mottled loamy fine sand; and light gray, mottled loamy fine sand.

The Ochlockonee soils are nearly level and moderately well drained. They are on low ridges or natural levees. These soils have a dark brown fine sandy loam surface layer. The next layer is also dark brown fine sandy loam. The underlying material is pale brown loamy fine sand in the upper part and yellowish brown loamy fine sand in the lower part. Below this is a buried subsoil of mottled strong brown and light gray sandy clay loam.

The minor soils in this map unit are the Cahaba and Harleston soils on low stream terraces and the Ouachita soils in landscape positions similar to those of the Ochlockonee soils.

The soils in this map unit are used mainly as woodland. Small acreages are used as pastureland or cropland.

These soils are moderately well suited to use as woodland. They have high potential to produce southern pine and hardwoods. The use of equipment can be somewhat difficult, and seedling mortality is moderate because of flooding and seasonal wetness. Competition from unwanted understory plants is an additional concern.

These soils are poorly suited or not suited to cultivated crops and moderately well suited to pasture because of flooding and seasonal wetness.

The soils in this map unit are poorly suited to urban and intensive recreational uses because of frequent flooding and seasonal wetness. These soils are generally not suited to homesites.

3. Hebert-Sterlington

This map unit consists of level to very gently sloping, somewhat poorly drained and well drained soils. They are on alluvial plains and flood plains. These soils are subject to rare to frequent flooding. Slopes range from 0 to 3 percent.

This map unit makes up about 1 percent of the parish. It is about 55 percent Hebert soils, 42 percent Sterlington soils, and 3 percent soils of minor extent.

The Hebert soils are somewhat poorly drained and are subject to occasional to frequent flooding. They are on broad flats, narrow ridges, and on natural levees. These soils have a dark brown or dark grayish brown silt loam surface layer. The subsurface layer is brown, mottled silt loam. The subsoil is brown, grayish brown, and reddish brown, mottled silty clay loam. The substratum is reddish brown, mottled silty clay loam.

The Sterlington soils are well drained and are subject to rare flooding. They are on natural levees. These soils have a brown very fine sandy loam surface layer and subsurface layer. The subsoil is yellowish red and light brown silt loam. The substratum is brown very fine sandy loam.

The minor soils in this map unit are the Perry and Portland soils on broad flats and in swales and other low positions.

The somewhat poorly drained Hebert soils are used mainly as woodland or pastureland. The well drained Sterlington soils are used mainly as cropland.

The Hebert soils are moderately well suited to use as woodland, mainly to produce hardwoods. The Sterlington soils are well suited to use as woodland. Flooding and wetness restrict the use of equipment and reduce the rate of seedling survival. Competition from unwanted understory plants is also a concern.

These soils are moderately well suited to cultivated crops, except for the areas that are subject to frequent flooding which are not suited to crops. The limitations are wetness, the hazard of flooding, and medium fertility.

The soils in this map unit that are subject to rare to occasional flooding are moderately well suited or well suited to use as pastureland. The soils that are subject to frequent flooding are poorly suited to use as pastureland. The limitations are wetness and the hazard of flooding.

The soils in this map unit are poorly suited to urban development. The soils that are subject to rare to occasional flooding are moderately well suited to intensive recreational uses. However, the soils subject to frequent flooding are poorly suited to intensive recreational uses. The limitations are wetness, the hazard of flooding, moderate shrink-swell potential, moderately slow and moderate permeability, and low strength on sites for roads and streets.

Soils on Low Stream Terraces and on High Terraces

This group of map units consists of level to strongly sloping, somewhat excessively drained, moderately well drained, somewhat poorly drained, and poorly drained sandy and loamy soils. The soils are on low stream terraces and on high terraces. The map units in this group make up about 10 percent of the parish. Most of the acreage is used as woodland or pastureland. Low fertility, seasonal wetness, the hazard of flooding, and the hazard of erosion are the main limitations for most uses.

4. Groom-Haggerty

This map unit consists of level, poorly drained and somewhat poorly drained soils. They are on broad flats and on low terraces that are former beaches of relict lakes. These soils are subject to occasional to frequent flooding. Slopes range from 0 to 2 percent.

This map unit makes up about 4 percent of the parish. It is about 85 percent Groom soils, 10 percent Haggerty soils, and 5 percent soils of minor extent.

The Groom soils are poorly drained. These soils have a grayish brown silt loam or silty clay loam surface layer. The next layer is grayish brown, mottled silt loam. The subsoil is gray, mottled silty clay loam in the upper part and grayish brown, mottled silty clay loam in the lower part.

The Haggerty soils are level and somewhat poorly drained. These soils have a dark grayish brown, mottled silty clay loam or fine sandy loam surface layer. From top to bottom, the layers of the subsoil are light brownish gray, mottled fine sandy loam; pale brown, mottled fine sandy loam; light brownish gray, mottled fine sandy loam; and light gray, mottled loamy fine sand. The substratum is light gray, mottled loamy fine sand.

The minor soils in this map unit are Litro, Perry, and Portland soils on flood plains.

The soils in this map unit are used mainly as woodland. Small acreages are used as pastureland or cropland.

These soils are moderately well suited to use as woodland. Flooding and wetness limit the use of equipment and reduce the rate of seedling survival. Competition from unwanted understory plants is also a concern.

The soils in this map unit that are subject to frequent flooding are not suited to cultivated crops. The soils that are subject to occasional flooding are poorly suited to cultivated crops. These soils are poorly suited or moderately well suited to pasture. The limitations are wetness, the hazard of flooding, and low fertility.

These soils are poorly suited to urban and intensive recreational uses. The limitations are wetness, the hazard of flooding, moderately slow permeability, and low strength on sites for roads and streets.

5. Frizzell-Guyton-Wrightsville

This map unit consists of nearly level and level, somewhat poorly drained and poorly drained soils. They are on low stream terraces and on high terraces. Some of the soils are subject to flooding. Slopes range from 0 to 2 percent.

This map unit makes up about 3 percent of the parish. It is about 67 percent Frizzell soils, 21 percent Guyton soils, 6 percent Wrightsville soils, and 6 percent soils of minor extent.

The Frizzell soils are nearly level and somewhat poorly drained. These soils are on broad flats. They have a dark brown silt loam surface layer. The next layer is yellowish brown, mottled silt loam and interfingers of light brownish gray silt loam. The subsoil is yellowish brown and mottled. It is silt loam in the upper part, silty clay loam in the middle part, and silt loam in the lower part.

The Guyton soils are level and poorly drained. They are subject to rare flooding. These soils are on broad flats and in depressions. They have a light brownish gray, mottled silt loam surface layer. The subsurface layer is light gray, mottled silt loam. The next layer is mottled grayish brown silty clay loam and tongues of light gray silt loam. The subsoil is grayish brown silty clay loam in the upper part, light brownish gray silt loam in the middle part, and grayish brown silt loam in the lower part.

The Wrightsville soils are level and poorly drained.

They are subject to occasional flooding. These soils have a grayish brown silt loam surface layer. The subsurface layer is gray, mottled silt loam in the upper part and light gray silt loam in the lower part. The next layer is grayish brown, mottled silty clay and tongues of light gray silt loam. The subsoil is light brownish gray, mottled silty clay.

The minor soils in this map unit are Groom soils on broad flats and Libuse and Savannah soils on high terraces.

The soils in this map unit are used mainly as woodland. In a few areas, they are used as cropland or homesites.

These soils are moderately well suited to use as woodland. The use of equipment is restricted by the hazard of flooding and wetness. Seedling mortality and plant competition are also problems.

The soils in this map unit that are subject to rare flooding are moderately well suited to cultivated crops. The soils that are subject to occasional to frequent flooding are not suited or poorly suited to cultivated crops. The main limitations are wetness and low fertility.

The Frizzell soils are well suited to use as pastureland. The Guyton and Wrightsville soils are poorly suited or moderately well suited to use as pastureland. The main limitations are wetness and low natural fertility.

The Frizzell soils are moderately well suited to urban and recreational uses. The Guyton and Wrightsville soils are poorly suited to urban and recreational uses. The main limitations are wetness, the hazard of flooding, slow or very slow permeability, and low strength on sites for roads and streets.

6. Libuse-Savannah-Ora

This map unit consists of moderately well drained soils on gently sloping ridgetops and moderately sloping or strongly sloping side slopes on high terraces. Slopes range from 1 to 5 percent on the ridgetops and from 5 to 12 percent on the side slopes.

This map unit makes up about 8 percent of the parish. It is about 41 percent Libuse soils, 33 percent Savannah soils, 19 percent Ora soils, and 7 percent soils of minor extent.

The Libuse soils are gently sloping and moderately sloping. They have a dark grayish brown silt loam surface layer. The next layer is yellowish brown, mottled silt loam. The subsoil is yellowish brown, mottled silty clay loam in the upper part. A fragipan of yellowish brown, mottled silt loam is in the lower part.

The Savannah soils are gently sloping and strongly sloping. These soils have a dark grayish brown or brown fine sandy loam surface layer. The subsurface layer is pale brown, mottled fine sandy loam. The subsoil is yellowish brown loam in the upper part. A fragipan of yellowish brown loam and sandy loam is in the lower part.

The Ora soils are gently sloping and strongly sloping. These soils have a dark grayish brown fine sandy loam surface layer. The subsurface layer is brown fine sandy loam. The next layer is yellowish red and dark brown loam. The subsoil is yellowish red clay loam. Below this is a fragipan of yellowish red sandy clay loam and strong brown sandy loam. The substratum is strong brown sandy loam.

The minor soils of this map unit are Frizzell, Malbis, and Ruston soils. The Frizzell soils are on low terraces, and the Malbis and Ruston soils are on uplands.

The soils in this map unit are used mainly as woodland. In a few areas, they are used as cropland, pastureland, or homesites.

The Libuse and Ora soils are well suited to use as woodland. The Savannah soils are moderately well suited to use as woodland. Plant competition is the main management concern. Wetness limits the use of equipment somewhat in areas of the Savannah soils.

The gently sloping soils in this map unit are moderately well suited to cultivated crops. The moderately sloping and strongly sloping soils are poorly suited to cultivated crops. The main limitations are steepness of slope, low fertility, and soil droughtiness.

The gently sloping soils in this map unit are well suited to use as pastureland. The moderately sloping and strongly sloping soils are moderately well suited to use as pastureland. The main limitations are steepness of slope, the hazard of erosion, and low fertility.

These soils are moderately well suited to urban and recreational uses. The main limitations are steepness of slope; seasonal wetness; moderate, moderately slow, and slow permeability; and low strength on sites for roads and streets.

7. Bienville-Smithton-Harleston

This map unit consists of somewhat excessively drained, poorly drained, and moderately well drained soils on very gently sloping and nearly level low stream terraces. These soils are subject to rare flooding. Slopes range from 0 to 3 percent.

This map unit makes up about 3 percent of the parish. It is about 40 percent Bienville soils, 30 percent Smithton soils, 27 percent Harleston soils, and 3 percent soils of minor extent.

The Bienville soils are very gently sloping and somewhat excessively drained. These soils have a dark brown loamy fine sand surface layer. The subsurface layer is yellowish brown loamy fine sand. The next layer is brown and pale brown loamy fine sand. The subsoil is reddish yellow loamy fine sand in the upper part and light yellowish brown, mottled loamy fine sand in the lower part.

The Smithton soils are nearly level and poorly drained. They have a grayish brown fine sandy loam surface layer. The subsurface layer is light brownish gray, mottled fine sandy loam. From top to bottom, the layers of the subsoil are light brownish gray sandy loam; light brownish gray, mottled fine sandy loam; gray, mottled sandy loam; and light brownish gray, mottled loam.

The Harleston soils are very gently sloping and moderately well drained. They have a grayish brown fine sandy loam surface layer. The subsurface layer is pale brown, mottled fine sandy loam. The next layer is yellowish brown fine sandy loam. From top to bottom, the layers of the subsoil are yellowish brown, mottled sandy loam; yellowish brown, mottled sandy clay loam; mottled yellowish brown, strong brown, and light brownish gray sandy clay loam; and yellowish brown, mottled loam.

The minor soils of this map unit are Cahaba and Guyton soils. The Cahaba soils are slightly lower on the landscape than the Bienville soils. The Guyton soils are on broad flats and in depressions.

The soils in this map unit are used mainly as woodland. In a few areas, they are used as cropland, pastureland, or homesites.

The Bienville and Smithton soils are moderately well suited to use as woodland. The Harleston soils are well suited to use as woodland. The main management concerns are an equipment use limitation and the seedling mortality caused by the sandy surface layer, soil droughtiness, or seasonal wetness. Plant competition is an additional concern.

These soils are moderately well suited or well suited to cultivated crops and pasture. The main limitations are low fertility, soil droughtiness, seasonal wetness, and the hazard of erosion.

The Bienville and Smithton soils are moderately well suited to urban and recreational uses because of wetness and the hazard of flooding and erosion. The Smithton soils are poorly suited to urban and recreational uses because of seasonal wetness and the hazard of flooding.

Soils on Uplands

The map units in this group consist of moderately well drained and well drained, gently sloping to moderately steep soils on ridgetops and side slopes in the uplands. The map units in this group make up about 67 percent of Union Parish. Most of the area is woodland or pastureland. Areas used as cropland generally are small and scattered. Steepness of slope is the main limitation for most uses.

8. Ruston-Smithdale-Malbis

This map unit consists of well drained and moderately well drained soils on gently sloping ridgetops and moderately sloping or strongly sloping side slopes in the uplands. The ridgetops are narrow or broad, and the side slopes are short to long. Slopes range from 1 to 5 percent on ridgetops and from 5 to 12 percent on the side slopes.

This map unit makes up about 13 percent of the parish. It is about 38 percent Ruston soils, 28 percent Smithdale soils, 28 percent Malbis soils, and 6 percent soils of minor extent.

The Ruston soils are well drained and gently sloping. They are on ridgetops. These soils have a brown, fine sandy loam surface layer. The subsurface layer is pale brown fine sandy loam. From top to bottom, the layers of the subsoil are yellowish red sandy clay loam; yellowish red fine sandy loam; yellowish red and light yellowish brown fine sandy loam; mottled yellowish red, yellowish brown, red, and light gray sandy clay loam; and mottled red, yellowish brown, and strong brown fine sandy loam.

The Smithdale soils are well drained and strongly sloping. They are on side slopes. These soils have a dark grayish brown fine sandy loam surface layer. The subsurface layer is pale brown fine sandy loam. The next layer is brown sandy loam. The subsoil is red and yellowish red sandy clay loam in the upper part and yellowish red sandy loam in the lower part.

The Malbis soils are moderately well drained or well drained and are gently sloping. They are on ridgetops. The surface layer is dark grayish brown fine sandy loam. The subsurface layer is light yellowish brown fine sandy loam. The subsoil is strong brown sandy clay loam in the upper part and yellowish brown, mottled sandy clay loam in the middle and lower parts.

The minor soils in this map unit are the Cahaba soils on low stream terraces and the Ora and Savannah soils on high terraces.

The soils in this map unit are used mainly as woodland. In a few areas, they are used as cropland, pastureland, or homesites.

These soils are well suited to use as woodland. They have few limitations to use as woodland.

The Ruston and Malbis soils are moderately well suited to use as cropland and well suited to use as pastureland. The main limitations are steepness of slope and low natural fertility. The strongly sloping Smithdale soils are not suited to use as cropland and moderately well suited to use as pastureland because of the hazard of erosion.

The soils in this map unit are moderately well suited to urban uses. The Ruston and Malbis soils are well suited to intensive recreational uses, and the Smithdale soils are moderately well suited to intensive recreational uses. The main limitations are steepness of slope, seasonal wetness, moderate and moderately slow permeability, and low strength on sites for roads and streets.

9. Sacul-Kirvin-Sawyer

This map unit consists of moderately well drained and well drained soils on gently sloping ridgetops and moderately sloping or strongly sloping side slopes in the uplands. Slopes range from 1 to 5 percent on the ridgetops and from 5 to 12 percent on the side slopes.

This map unit make up about 9 percent of the parish. It is about 42 percent Sacul soils, 29 percent Kirvin soils, 24 percent Sawyer soils, and 5 percent soils of minor extent.

The Sacul soils are moderately well drained. They are on gently sloping ridgetops and strongly sloping side slopes. These soils have a dark brown or dark grayish brown very fine sandy loam surface layer. The subsurface layer is light yellowish brown, mottled very fine sandy loam. From top to bottom, the layers of the subsoil are red clay; red, mottled clay; mottled grayish brown and red clay; pale brown, mottled clay; and light brownish gray, mottled silty clay loam.

The Kirvin soils are well drained. They are on gently sloping ridgetops and on strongly sloping side slopes. These soils have a brown fine sandy loam surface layer. From top to bottom, the layers of the subsoil are dark red clay; red sandy clay; and red, mottled sandy clay loam. The substratum is red, mottled sandy clay loam.

The Sawyer soils are moderately well drained. They are on gently sloping ridgetops and moderately sloping side slopes. These soils have a brown or dark grayish brown silt loam surface layer. The subsoil is a strong brown, mottled loam in the upper part; yellowish brown, mottled silty clay loam in the middle part; and gray and light brownish gray, mottled silty clay in the lower part.

The minor soils in this map unit are the Darley, Mahan, and Ruston soils on ridgetops and side slopes.

The soils in this map unit are used mainly as woodland. Small acreages are used as pastureland, cropland, or homesites.

These soils are moderately well suited or well suited to use as woodland. They have few limitations to use as woodland. However, wetness can limit the use of equipment in areas of the Sacul soils.

The gently sloping and moderately sloping soils in this map unit are poorly suited or moderately well suited to cultivated crops and well suited to pasture. The strongly sloping soils are not suited to cultivated crops and moderately well suited to pasture. The main limitations are the erosion hazard and low soil fertility.

The Kirvin and Sawyer soils are moderately well suited to urban and intensive recreational uses. The main limitations are moderately slow or slow permeability, steepness of slope, moderate or high shrink-swell potential, and low strength on sites for roads and streets. The Sacul soils are poorly suited to urban and recreational uses, mainly because of wetness.

10. Darley-Sacul-Mahan

This map unit consists of well drained and moderately well drained soils on gently sloping ridgetops and strongly sloping and moderately steep side slopes. The ridgetops are mostly narrow and convex, and the side slopes are short to long. Slopes range from 1 to 5 percent on the ridgetops and from 5 to 30 percent on the side slopes.

This map unit makes up about 12 percent of the parish. It is about 41 percent Darley soils, 32 percent Sacul soils, 20 percent Mahan soils, and 7 percent soils of minor extent.

The Darley soils are well drained. They are on gently sloping ridgetops and on strongly sloping and moderately steep side slopes. These soils have a dark brown gravelly fine sandy loam surface layer. The subsurface layer is yellowish red gravelly fine sandy loam. The subsoil is red clay in the upper part and alternating layers of red and strong brown sandy clay and fractured ironstone in the lower part.

The Sacul soils are moderately well drained. They are on gently sloping ridgetops and strongly sloping side slopes. These soils have a dark brown or dark grayish brown very fine sandy loam surface layer. The subsurface layer is light yellowish brown, mottled very fine sandy loam. From top to bottom, the layers of the subsoil are red clay; red, mottled clay; mottled grayish brown and red clay; pale brown, mottled clay; and light brownish gray, mottled silty clay loam.

The Mahan soils are well drained. They are on gently sloping ridgetops and strongly sloping side slopes. These soils have a brown or dark brown fine sandy loam surface layer. The next layer is reddish brown fine sandy loam. From top to bottom, the layers of the subsoil are dark red, mottled clay loam; dark red, mottled sandy clay loam; red sandy clay loam; and red sandy loam. Fragments of ironstone are throughout the subsoil.

The minor soils in this map unit are the Bowie, Kirvin, and Ruston soils. The Bowie and Ruston soils are on ridgetops, and the Kirvin soils are on both ridgetops and side slopes.

The soils in this map unit are used mainly as woodland. Small acreages are used as cropland, pastureland, or homesites.

The Darley and Mahan soils are well suited to use as woodland. They have few limitations to use as woodland. However, the moderately steeply sloping areas of Darley soils are only moderately well suited because of an erosion hazard. The Sacul soils are moderately well suited because wetness limits the use of equipment during wet periods.

The gently sloping soils in this map unit are poorly suited to moderately well suited to cultivated crops and well suited to pasture. The strongly sloping and moderately steep soils are not suited to crops and are poorly suited to moderately well suited to pasture. The main limitations are steepness of slope and medium or low fertility.

The gently sloping and strongly sloping Darley soils are moderately well suited to urban development and poorly suited to intensive recreational uses. The main limitations are steepness of slope; fragments of ironstone on the surface and in the subsoil; moderate, moderately slow, and slow permeability; and low strength on sites for roads and streets. Also, the hazard of erosion is severe. The moderately steep areas of the Darley soils are poorly suited to urban and recreational uses. The Sacul soils are poorly suited to urban development and moderately well suited to intensive recreational uses, mainly because of wetness and a high shrink-swell potential. The Mahan soils are moderately well suited to urban development because of steepness of slope and low strength on sites for roads and streets. Gently sloping areas of Mahan soils are well suited to intensive recreational uses, and strongly sloping areas of Mahan soils are moderately well suited to intensive recreational uses.

11. Ruston-Darley-McLaurin

This map unit consists of well drained soils on uplands. The soils are on gently sloping ridgetops and on strongly sloping and moderately steep side slopes. Slopes range from 1 to 5 percent on ridgetops and from 5 to 30 percent on side slopes.

This map unit makes up about 11 percent of the parish. It is about 43 percent Ruston soils, 38 percent Darley soils, 6 percent McLaurin soils, and 13 percent soils of minor extent.

The Ruston soils are gently sloping. They are on ridgetops. These soils have a brown fine sandy loam surface layer. The subsurface layer is pale brown fine sandy loam. From top to bottom, the layers of the subsoil are yellowish red sandy clay loam; yellowish red fine sandy loam; yellowish red and light yellowish brown fine sandy loam; mottled yellowish red, yellowish brown, red, and light gray sandy clay loam; and mottled red, yellowish brown, and strong brown fine sandy loam.

The Darley soils are on gently sloping ridgetops and strongly sloping and moderately steep side slopes. These soils have a dark brown gravelly fine sandy loam surface layer. The subsurface layer is yellowish red gravelly fine sandy loam. The subsoil is red clay in the upper part and alternating layers of red and strong brown sandy clay and fractured ironstone in the lower part.

The McLaurin soils are on gently sloping ridgetops. These soils have a brown fine sandy loam surface layer and a light yellowish brown fine sandy loam subsurface layer. The next layer is strong brown fine sandy loam. The subsoil is red sandy loam and red, mottled fine sandy loam in the upper part; yellowish red and reddish yellow sandy loam in the middle part; and red sandy clay loam in the lower part.

The minor soils in this map unit are Malbis, Sacul, and Smithdale soils. The Malbis soils are on nearly level ridgetops and the Smithdale soils are on side slopes. The Sacul soils are on both ridgetops and side slopes.

The soils in this map unit are used mainly as woodland. Small acreages are used as pastureland, cropland, or homesites.

These soils are well suited to use as woodland. They have few limitations to use as woodland. However, moderately steep areas of the Darley soils are moderately well suited to use as woodland, mainly because of the erosion hazard.

The Ruston soils are moderately well suited to use as cropland and well suited to use as pastureland. The main limitation is low fertility. The strongly sloping Darley soils are not suited to use as cropland and are moderately well suited to use as pastureland. The main limitation is the erosion hazard. The moderately steep Darley soils are not suited to use as cropland and poorly suited to use as pastureland. The main limitation is the erosion hazard.

The Ruston soils are moderately well suited to urban development and well suited to intensive recreational uses, mainly because of steepness of slope. The Darley soils are moderately well suited to urban development and poorly suited to intensive recreational uses. However, the moderately steeply sloping Darley soils are poorly suited to urban development. The main limitations are steepness of slope, moderately slow permeability, and small stones on the surface. The McLaurin soils are well suited to urban and intensive recreational uses. The hazard of erosion is the main management concern.

12. Darley-Angie-Bowie

This map unit consists of well drained and moderately well drained soils. They are on gently sloping ridgetops and strongly sloping and moderately steep side slopes. The ridgetops are narrow or broad, and the side slopes are short to long. Slopes range from 1 to 5 percent on the ridgetops and from 5 to 30 percent on the side slopes.

This map unit makes up about 5 percent of the parish. It is 57 percent Darley soils, 18 percent Angie soils, 5 percent Bowie soils, and 20 percent soils of minor extent.

The Darley soils are well drained and gently sloping, strongly sloping, and moderately steep. They are on ridgetops and side slopes. These soils have a dark brown gravelly fine sandy loam surface layer. The subsurface layer is yellowish red gravelly fine sandy loam. The subsoil is red clay in the upper part and alternating layers of red and strong brown sandy clay and fractured ironstone in the lower part.

The Angie soils are moderately well drained and gently sloping. They are on broad ridgetops. These soils have a very dark grayish brown very fine sandy loam surface layer. The subsurface layer is light yellowish brown, mottled very fine sandy loam. From top to bottom, the layers of the subsoil are strong brown silty clay loam; yellowish brown, mottled silty clay loam; strong brown, mottled silty clay; yellowish brown, mottled silty clay; and gray, mottled clay.

The Bowie soils are moderately well drained and gently sloping. They are on broad, slightly convex ridgetops. These soils have a yellowish brown fine sandy loam surface layer. The subsurface layer is light yellowish brown fine sandy loam. The subsoil is strong brown sandy clay loam in the upper and middle parts and yellowish brown sandy clay loam in the lower part. The subsoil is mottled in the middle and lower parts.

The minor soils in this map unit are Eastwood, Kirvin, and Sacul soils on ridgetops and on side slopes.

The soils in this map unit are used mainly as pastureland or woodland. Small acreages are used as cropland or homesites.

The Bowie and gently sloping and strongly sloping areas of Darley soils are well suited to use as woodland. The Angie and moderately steep areas of Darley soils are moderately well suited to use as woodland because wetness can limit the use of equipment. Also, erosion is a hazard on the moderately steep areas of Darley soils.

The Angie, Bowie, and gently sloping areas of Darley soils are well suited to cultivated crops and are well suited to pasture. The strongly sloping and moderately steep areas of Darley soils are not suited to cultivated crops. The main limitation is the hazard of erosion. The strongly sloping areas of Darley soils are moderately well suited to pasture, and the moderately steep areas of Darley soils are poorly suited to pasture, mainly because of steepness of slope and the hazard of erosion.

The gently sloping and strongly sloping areas of Darley soils are moderately well suited to urban development and poorly suited to intensive recreational uses. The main limitations are moderately slow or slow permeability, small stones on the surface, and layers of ironstone in the subsoil. The Angie soils are poorly suited to urban development and moderately well suited to recreational uses, mainly because of wetness and a high shrink-swell potential. The Bowie soils are moderately well suited to urban development and well suited to intensive recreational uses. The limitations are wetness, moderately slow permeability, and low strength on sites for roads and streets. The moderately steep areas of Darley soils are poorly suited to urban development and intensive recreational uses because of steepness of slope, moderately slow permeability, and layers of ironstone in the subsoil.

13. Darley-Kirvin-Warnock

This map unit consists of well drained and moderately well drained soils. These soils are on gently sloping ridgetops and strongly sloping and moderately steep side slopes. The ridgetops are mainly narrow and convex, and the side slopes are short to long. Slopes range from 1 to 5 percent on the ridgetops and from 5 to 30 percent on the side slopes.

This map unit makes up about 9 percent of the parish. It is about 52 percent Darley soils, 29 percent Kirvin soils, 12 percent Warnock soils, and 7 percent soils of minor extent.

The Darley soils are well drained. They are on gently sloping ridgetops and strongly sloping and moderately steep side slopes. These soils have a dark brown gravelly fine sandy loam surface layer. The subsurface layer is yellowish red gravelly fine sandy loam. The subsoil is red clay in the upper part and alternating layers of red and strong brown sandy clay loam and fractured ironstone in the lower part.

The Kirvin soils are well drained. They are on gently sloping ridgetops and on strongly sloping side slopes. These soils have a brown fine sandy loam surface layer. From top to bottom, the layers of the subsoil are dark red clay; red sandy clay; and red, mottled sandy clay loam. The substratum is red, mottled sandy clay loam.

The Warnock soils are moderately well drained. They are on gently sloping ridgetops. These soils have a dark grayish brown fine sandy loam surface layer. The next layer is brown fine sandy loam. The subsurface layer is light yellowish brown fine sandy loam. From top to bottom, the layers of the subsoil are strong brown loam; strong brown, mottled sandy clay loam; mottled yellowish brown and red clay loam; and strong brown, mottled sandy clay loam.

The minor soils in this map unit are Mahan, Sacul, and Trep soils. The Mahan and Sacul soils are on ridgetops and side slopes. The Trep soils are on ridgetops.

The soils in this map unit are used mainly as woodland. Small acreages are used as pastureland, cropland, or homesites.

These soils are well suited to use as woodland.

Competition from understory plants is the main management concern. However, the moderately steep areas of Darley soils are moderately well suited to use as woodland because of the hazard of erosion.

The Warnock and gently sloping areas of Darley and Kirvin soils are moderately well suited to cultivated crops and well suited to pasture. The main limitations are the hazard of erosion and low to medium fertility. The strongly sloping areas of Darley and Kirvin soils are not suited to cultivated crops and moderately well suited to pasture, mainly because of the hazard of erosion. The moderately steep areas of Darley soils are not suited to cultivated crops and poorly suited to pasture because of steepness of slope and the hazard of erosion.

The gently sloping and strongly sloping areas of Darley soils are moderately well suited to urban development and poorly suited to intensive recreational uses. The main limitations are moderate and moderately slow permeability and layers of ironstone and small stones on the surface. The moderately steep areas of Darley soils are poorly suited to urban development and intensive recreational uses, mainly because of steepness of slope. The Kirvin soils are moderately well suited to urban development and intensive recreational uses, mainly because of moderately slow permeability, moderate shrink-swell potential, and low strength on sites for roads and streets. The Warnock soils are moderately well suited to urban development and well suited to intensive recreational uses, mainly because of wetness, moderate permeability, and low strength on sites for roads and streets.

Detailed Soil Map Units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Darley gravelly fine sand loam, 1 to 5 percent slopes is one of three phases of the Darley series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Iuka-Ochlockonee complex, frequently flooded, is an example.

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

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

An=Angie very fine sandy loam, 1 to 5 percent slopes

This soil is very gently sloping and is moderately well drained. It is on broad ridgetops on uplands. The areas of this soil are irregular in shape and range from 100 to several hundred acres.

Typically, the surface layer is very dark grayish brown very fine sandy loam about 4 inches thick. The subsurface layer to a depth of about 11 inches is light yellowish brown, mottled very fine sandy loam. The subsoil extends to a depth of about 60 inches. From top to bottom, the layers of the subsoil are strong brown silty clay loam; yellowish brown, mottled silty clay loam; strong brown, mottled silty clay; yellowish brown, mottled silty clay; and gray, mottled clay.

This soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Water runs off the surface at a medium rate. A seasonal high water table is 3 to 5 feet below the surface from December to April. The shrink-swell potential is high. The available water capacity is high to very high.

Included with this soil in mapping are a few small areas of Bowie, Eastwood, and Sacul soils. Bowie soils are at a slightly higher elevation than the Angie soil and are loamy throughout the profile. Eastwood and Sacul soils are on strongly sloping side slopes. Sacul soils are also in landscape positions similar to those of the Angie soil. In these soils, the upper part of the subsoil is redder than that of the Angie soil. The included soils make up about 10 percent of the map unit.

This Angie soil is used mainly as woodland or pastureland. A small acreage is used as cropland.

This soil is moderately well suited to the production of loblolly pine. The main concern in producing and harvesting timber is an equipment use limitation because of wetness. Competition from undesirable understory plants is an additional concern. Conventional methods of harvesting timber cannot be used during rainy periods, generally from December to April. To prevent rutting and soil compaction, mechanical site preparation and harvesting activities can be scheduled for the drier periods. Competing vegetation can be controlled by proper site preparation. Spraying, cutting, or girdling eliminates unwanted weeds, brush, or trees.

This soil is moderately well suited to cultivated crops. The main crops grown are cotton and corn. This soil is limited mainly by wetness and the hazard of erosion. Potentially toxic levels of aluminum are in the root zone. Proper row arrangement, field ditches, and vegetated outlets help to remove excess surface water. Conservation tillage, terraces, diversions, and grassed waterways help to control erosion. Crop residue left on or near the surface helps to maintain tilth and organic matter content. Crops respond well to fertilizer and lime, which help to overcome the low soil fertility and reduce the high levels of exchangeable aluminum.

This Angie soil is well suited to pasture; however, wetness during December through April is a limitation. The main suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, ball clover, crimson clover, and arrowleaf clover. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant community. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is poorly suited to urban development because of wetness, slow permeability, the clayey subsoil, high shrink-swell potential, and low strength for roads. Excess water can be removed by using shallow ditches and providing the proper grade. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. Increasing the size of septic tank absorption fields helps to compensate for the slow permeability of the subsoil. Buildings and roads can be designed to offset the effects of shrinking and swelling and to compensate for the limited ability of the soil to support a load.

This soil is moderately well suited to most recreational uses. It is limited mainly by slow permeability. Steepness of slope is a limitation for playgrounds. Drainage can improve this soil for intensively used areas, such as playgrounds and camp areas. A good plant cover on playgrounds helps to control erosion.

This soil has good potential as habitat for woodland and openland wildlife and poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Angie soil is in capability subclass IIIe. The woodland ordination symbol is 9W.

Ba=Betis loamy fine sand, 1 to 5 percent slopes

This soil is gently sloping and somewhat excessively drained. It is on ridgetops on uplands. The areas of this soil are irregular in shape and range from about 10 to 150 acres.

Typically, this Betis soil has a dark brown loamy fine sand surface layer about 7 inches thick. The next layer to a depth of about 25 inches is yellowish brown loamy fine sand. The subsoil is strong brown, mottled loamy fine sand to a depth of about 45 inches. To a depth of about 60 inches, it is strong brown fine sandy loam. The lower part of the subsoil to a depth of about 75 inches is strong brown loamy fine sand and pink fine sand.

This soil has low fertility. Water and air move through this soil at a rapid rate. Water runs off the surface at a very slow rate. This soil has low available water capacity. In most years, most plants are damaged by a shortage of water during summer and fall. The shrink-swell potential is low. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of the Briley, McLaurin, and Trep soils. These soils are in landscape positions similar to those of the Betis soil. They are well drained and have a loamy subsoil. The included soils make up about 10 percent of the map unit.

This Betis soil is used mainly as woodland. A small acreage is used as pastureland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is moderately high. The surface layer provides poor traction if it is dry, and seedling mortality is severe because of soil droughtiness. Seedling survival rates can be increased if seedlings are planted in spring when the content of soil moisture is the highest.

This soil is moderately well suited to crops and pasture. Low fertility, limited choice of plants, and soil droughtiness are unfavorable features for these uses. This soil is well suited to specialty crops, such as watermelons and peanuts. Suitable pasture plants include improved bermudagrass, bahiagrass, weeping lovegrass, and crimson clover. This soil is friable and easy to keep in good tilth. It is easy to work when moist, but traction is poor when the surface layer is dry. Proper management of crop residue helps to maintain organic matter content, improve tilth, and conserve moisture. The response to fertilizer is fair, and lime is generally needed.

This soil is moderately well suited to urban development. Cutbanks are subject to caving if shallow excavations are made. Seepage is too excessive for most sanitary facilities. If the density of housing is moderate to high, community sewage systems are needed to prevent contamination of water supplies as a result of seepage. Mulching, fertilizing, and irrigating can help to establish lawn grasses and small-seeded plants.

This soil is moderately well suited to recreational uses. The sandy surface layer becomes loose when dry and provides poor traction. Irrigation generally is needed for golf course fairways and in other areas where landscape plants and lawn grasses are planted. The slope is an additional limitation for playgrounds.

This soil has fair potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Betis soil is in capability subclass IIIs. The woodland ordination symbol is 7S.

Be=Bienville loamy fine sand, 1 to 3 percent slopes

This soil is very gently sloping and somewhat excessively drained. It is on low stream terraces. The areas of this soil are narrow or irregular in shape and range from 20 to 300 acres.

Typically, this Bienville soil has a dark brown loamy fine sand surface layer about 12 inches thick. The subsurface layer to a depth of about 19 inches is yellowish brown loamy fine sand. The next layer to a depth of about 28 inches is brown and pale brown loamy fine sand. The subsoil to a depth of about 60 inches is reddish yellow loamy fine sand in the upper part; and light yellowish brown, mottled loamy fine sand in the lower part.

This soil has low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderately rapid rate. Water runs off the surface at a slow rate. A seasonal high water table is 4 to 6 feet below the surface from December to April. This soil dries quickly after rains. The shrink-swell potential is low. Flooding is rare, but it can occur during unusually wet periods. The available water capacity is low to moderate.

Included with this soil in mapping are a few small areas of Cahaba, Guyton, and Harleston soils. Cahaba soils are slightly higher on the landscape than those of the Bienville soil. They are well drained and have a reddish, loamy subsoil. Guyton soils are in broad depressional areas and in shallow drainageways. They are poorly drained and are grayish throughout the profile. Harleston soils are in slightly lower positions and are moderately well drained and loamy throughout the profile. The included soils make up about 10 percent of the map unit.

This Bienville soil is used mainly as woodland. Small acreages are used as pastureland or cropland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is high. The main limitations for use and management are a severe equipment use limitation and moderate seedling mortality caused by the sandy surface layer and soil droughtiness. Proper site preparation controls initial plant competition, and spraying controls subsequent growth. To reduce the seedling mortality rate, seedlings can be planted in spring to obtain additional moisture from spring rain.

This soil is moderately well suited to cultivated crops; however, low fertility, soil droughtiness, and potentially toxic levels of exchangeable aluminum in the root zone are limitations. Erosion is a slight hazard. Suitable crops are cotton, corn, and wheat. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. A sprinkler irrigation system works well on this soil. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Crops respond well to fertilizer and lime, which help to overcome the low fertility and reduce the moderately high levels of exchangeable aluminum. Early fall seeding, conservation tillage, and grassed waterways help to control erosion.

This soil is well suited to pasture. Low fertility and soil droughtiness are the main limitations. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. Proper grazing, weed control, and fertilizer help to maintain production and quality of forage.

This Bienville soil is moderately well suited to urban development. The hazard of flooding, seasonal wetness, and the sandy texture are the main limitations. Seepage is a hazard for sewage lagoons or sanitary landfills. Establishing and maintaining the plant cover can be achieved through proper irrigation, fertilizing, seeding, mulching, and shaping of the slopes. Flooding is a hazard and wetness is a limitation to septic tank absorption fields. Where flooding is controlled, self-contained disposal units can be used to dispose of sewage properly. Where shallow excavations are made, special retainer walls can be used to prevent cutbanks from caving. Flooding can be reduced by earthen levees and diversions.

This soil is moderately well suited to recreational uses. The sandy texture of the surface layer is the main limitation, and steepness of slope is a moderate limitation for playgrounds. Flooding is a hazard to camp areas. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover. The cover can be maintained by adding fertilizer, irrigation, and by controlling traffic. Flooding can be controlled by using levees and diversions.

This soil has fair potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Small clear-cuts in irregular shapes provide maximum edge for use by deer.

This Bienville soil is in capability subclass IIs. The woodland ordination symbol is 10S.

Bh=Bowie fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and moderately well drained. It is mainly on broad, slightly convex ridgetops on uplands. The areas of this soil are irregular in shape and range from about 20 to 200 acres.

Typically, the surface layer is yellowish brown fine sandy loam about 4 inches thick. The subsurface layer to a depth of about 14 inches is light yellowish brown fine sandy loam. The subsoil to a depth of about 34 inches is strong brown sandy clay loam. Between depths of about 34 and 60 inches, it is yellowish brown, mottled sandy clay loam. The lower part of the subsoil is mottled.

This Bowie soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a medium rate. A seasonal high water table is 3.5 to 5 feet below the surface from January to April. The available water capacity is moderate. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Angie, Briley, Eastwood, and Mahan soils. Angie and Eastwood soils are at a slightly lower elevation than the Bowie soil and have a loamy and clayey subsoil. Briley and Mahan soils are in landscape positions similar to those of the Bowie soil. Briley soils have a thick sandy surface layer. Mahan soils contain layers and fragments of ironstone. The included soils make up about 15 percent of the map unit.

This Bowie soil is used mainly as woodland or pastureland (fig. 2). Small acreages are used as cropland or homesites.

This Bowie soil is well suited to use as woodland. There are no significant limitations for producing and harvesting timber. The potential for production of loblolly pine is high.

This soil is moderately well suited to crops and well suited to pasture; however, areas without a plant cover erode easily. Low soil fertility and potentially toxic levels of exchangeable aluminum are also limitations. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, and crimson clover. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Managing crop residue, stripcropping, farming on the contour, and terracing reduce soil loss by erosion. Most crops respond well to fertilizer and lime, which help to overcome the low fertility and reduce the high levels of exchangeable aluminum.

This soil is moderately well suited to urban development. It has few limitations for use as sites for buildings; however, a seasonal high water table and the moderately slow permeability of the subsoil are limitations to use as septic tank absorption fields. This limitation can be overcome by drainage and by enlarging the size of the absorption field. Low strength for roads and streets can be overcome by strengthening the road base.

This soil is well suited to recreational uses; however, steepness of slope is a moderate limitation for playgrounds.

This soil has good potential as habitat for woodland and openland wildlife and poor potential as habitat for wetland wildlife. There are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Where the forest borders agricultural lands, field borders planted with shrubs or annual game-food mixtures will provide food and cover for wildlife.

This Bowie soil is in capability subclass IIIe. The woodland ordination symbol is 9A.

Bo=Boykin loamy fine sand, 1 to 5 percent slopes

This soil is gently sloping and well drained. It is on convex ridgetops on uplands. The areas of this soil are irregular in shape and range from about 10 to 250 acres.

Typically, this Boykin soil has a brown loamy fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 24 inches is pale brown loamy fine sand. The subsoil to a depth of about 60 inches is yellowish red fine sandy loam in the upper part and mottled strong brown and yellowish red sandy clay loam in the middle and lower parts.

Figure 2.—A new pasture in a recently cleared area of Bowie fine sandy loam, 1 to 5 percent slopes.

This soil has low fertility. Water and air move through the upper part of this soil at a rapid rate and through the lower part at a moderate rate. Water runs off the surface at a slow rate. This soil dries out quickly and has moderate available water capacity. In most years, most plants are damaged by a shortage of water during summer and fall. The shrink-swell potential is low. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Betis, Ruston, and Trep soils. These soils are on ridgetops in landscape positions similar to those of the Boykin soil. Betis soils are also on side slopes and are sandy throughout the profile. Ruston soils are loamy throughout the profile. Trep soils have a brownish subsoil and a seasonal high water table. The included soils make up about 15 percent of the map unit.

This Boykin soil is used mainly as woodland. Small acreages are used as pastureland or cropland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is moderately high. Poor traction can restrict equipment use during dry periods. Seedling mortality is moderate because of soil droughtiness. Planting in spring when rainfall is most abundant can improve seedling survival. Competition from unwanted understory plants can be reduced by proper site preparation.

This soil is moderately well suited to crops and pasture. Erosion is a hazard, and droughtiness limits the choice of crops and pasture plants. The main suitable crops are peanuts and watermelons. Cotton and corn can be grown, but production is low, especially in years of less than normal rainfall. The main suitable pasture plants are improved bermudagrass, bahiagrass, weeping lovegrass, and crimson clover. This soil is friable and easy to keep in good tilth. It is easy to work when moist, but traction is poor when the soil is dry. Conservation practices, such as returning all crop residue to the soil, help to conserve moisture and improve soil fertility and content of organic matter. Crops respond well to fertilizer and lime, which help to overcome the low soil fertility.

This soil is well suited to urban development; however, seepage is a problem if this soil is used for sanitary facilities. Self-contained sewage disposal units or community sewage disposal units prevent contamination of ground water supplies as a result of seepage.

This soil is moderately well suited to recreational uses. The sandy surface layer becomes loose when dry and provides poor traction. Steepness of slope is a limitation for playgrounds. Irrigation is needed to maintain a good plant cover.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Woodlands that are managed in small units improve wildlife habitat by providing a variety of plant species, ages, and tree sizes.

This Boykin soil is in capability subclass IIIs. The woodland ordination symbol is 10S.

Br=Briley loamy fine sand, 1 to 5 percent slopes

This soil is gently sloping and well drained. It is on convex ridgetops on uplands. The areas of this soil are irregular in shape and range from about 10 to 250 acres.

Typically, the surface layer is dark grayish brown loamy fine sand about 4 inches thick. The subsurface layer to a depth of about 23 inches is light yellowish brown, mottled loamy fine sand. The subsoil to a depth of about 35 inches is red, mottled sandy clay loam. The next part of the subsoil to a depth of about 48 inches is yellowish red fine sandy loam. The lower part of the subsoil to a depth of about 60 inches is red loam.

This Briley soil has low fertility. Water and air move through the upper part of this soil at a rapid rate and through the lower part at a moderate rate. Water runs off the surface at a slow rate. This soil dries out quickly and has low to moderate available water capacity. In most years, most plants are damaged by lack of water during summer and fall. The shrink-swell potential is low. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Betis, McLaurin, and Trep soils. These soils are on ridgetops in landscape positions similar to those of the Briley soil. Betis soils are also on side slopes and are sandy throughout the profile. McLaurin soils are loamy throughout the profile. Trep soils have a brownish subsoil and a seasonal high water table. The included soils make up about 15 percent of the map unit.

This Briley soil is used mainly as woodland. Small acreages are used as pastureland or cropland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is moderately high. Poor traction can restrict equipment use during dry periods. Seedling mortality is moderate because of soil droughtiness. Initial growth of seedlings is improved if planting is done when the soil moisture supply is highest which is in early spring. Mulching around seedlings helps to retain moisture in summer. Competition from unwanted understory plants can be reduced by proper site preparation.

This soil is moderately well suited to crops and pasture. Erosion is a hazard, and droughtiness limits the choice of crops and pasture plants. The main suitable crops are peanuts and watermelons. Cotton and corn can be grown, but production is low, especially in years of less than normal rainfall. The main suitable pasture plants are improved bermudagrass, bahiagrass, weeping lovegrass, and crimson clover. This soil is friable and easy to keep in good tilth. It is easy to work when moist, but traction is poor when the soil is dry. Conservation practices, such as returning all crop residue to the soil, help to conserve moisture and improve soil fertility and organic matter content. Crops respond well to fertilizer and lime, which help to overcome the low soil fertility.

This soil is well suited to urban development. Seepage is a problem for sanitary facilities. Cutbanks cave easily where shallow excavations are constructed. Self-contained sewage disposal units or community sewage disposal units prevent seepage of effluent and contamination of ground water supplies. Special retainer walls can prevent caving of shallow excavations.

This soil is moderately well suited to recreational uses. The sandy surface layer becomes loose when dry and provides poor traction. Steepness of slope is a limitation for playgrounds. Irrigation can help to maintain a good plant cover.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Small areas of grain left for food patches near good wildlife cover can also improve the habitat for wildlife.

This Briley soil is in capability subclass IIIs. The woodland ordination symbol is 8S.

Ca=Cahaba fine sandy loam, 1 to 5 percent slopes

This soil is very gently sloping and well drained. It is on low stream terraces. The areas of this soil are irregular in shape and range from about 10 to 200 acres.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The next layer is dark brown and strong brown fine sandy loam about 6 inches thick. The subsoil to a depth of about 37 inches is yellowish red and red sandy clay loam and loam. The substratum to a depth of about 68 inches is yellowish red fine sandy loam in the upper part, yellowish red loamy fine sand in the middle part, and light brown fine sand in the lower part.

This Cahaba soil has low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to some crops. Runoff is medium. Water and air move through this soil at a moderate rate. The available water capacity is low to moderate. The shrink-swell potential is low. This soil is subject to rare flooding. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Guyton and Iuka soils. Guyton soils are on flood plains, in drainageways, and in depressions. They are poorly drained and grayish throughout the profile. Iuka soils are on flood plains and have a brownish subsoil. The included soils make up about 15 percent of the map unit.

This Cahaba soil is used mainly as woodland. In a few areas, it is used as homesites or pastureland.

This Cahaba soil is well suited to use as woodland. The potential for production of loblolly pine is high. This soil has few limitations for use and management; however, adequate site preparation is needed to reduce competition from undesirable understory plants.

This Cahaba soil is well suited to crops. It is limited mainly by low fertility, soil droughtiness, and a potentially toxic level of exchangeable aluminum in the root zone. The hazard of erosion is moderate. The main suitable crops are cotton, soybeans, corn, and vegetables. Conservation tillage, terraces, diversions, and grassed waterways help to control erosion. The organic matter content can be maintained by using a suitable cropping system. Most crops and pasture plants respond well to fertilizer and lime, which help to overcome the low fertility and reduce the levels of exchangeable aluminum in the root zone.

This soil is well suited to pasture. The main limitations are low fertility and soil droughtiness. The main suitable pasture plants are improved bermudagrass, common bermudagrass, bahiagrass, ryegrass, ball clover, and crimson clover. Proper grazing practices, weed control, and fertilizer are needed for maximum quality of forage.

This soil is poorly suited to most urban uses. Flooding is the main hazard. Cutbanks cave easily where shallow excavations are constructed. Also, seepage is a problem and ground water can be contaminated where this soil is used for sewage lagoons or sanitary landfills. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. Flooding can be reduced by levees and diversions.

This soil is moderately well suited to recreational uses. Flooding is a hazard to camp areas and playgrounds. The slope is a limitation for playgrounds. Maintaining a good vegetative cover on playgrounds helps to control erosion. Flooding can be reduced by levees and diversions.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. There are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Prescribed burning in forested areas can increase the amount of browse palatable to deer and seed-producing plants for quail and turkey.

This Cahaba soil is in capability subclass IIe. The woodland ordination symbol is 9A.

Dk=Darley gravelly fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and well drained. It is on convex ridgetops on uplands. The areas of this soil are irregular in shape and range from about 20 to 200 acres.

Typically, this Darley soil has a dark brown gravelly fine sandy loam surface layer about 7 inches thick. The subsurface layer to a depth of about 13 inches is yellowish red gravelly fine sandy loam. The subsoil to a depth of about 29 inches is red clay. To a depth of about 45 inches, it is red clay that contains pockets of strong brown and gray materials and fragments of ironstone. The lower part of the subsoil to a depth of about 60 inches is alternating layers of red and strong brown sandy clay and nearly continuous layers of fractured ironstone.

This soil has medium fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderately slow rate. The available water capacity is moderate to high. The large amount of ironstone fragments in the surface layer and subsoil reduces the available water capacity. Water runs off the surface at a medium rate. The shrink-swell potential is low. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Bowie, Mahan, and Ruston soils. These soils are on ridgetops in landscape positions similar to those of the Darley soil. Mahan soils are also on side slopes. Bowie and Ruston soils are loamy throughout the profile. Mahan soils do not have layers of ironstone in the subsoil. The included soils make up about 10 percent of the map unit.

This Darley soil is used mainly as woodland. In a few areas, it is used as pastureland or cropland.

This soil is well suited to use as woodland and has few limitations for producing and harvesting timber. The potential for production of loblolly pine is moderately high. If site preparation is not adequate, competition from undesirable plants can prolong reestablishment of trees.

This soil is moderately well suited to cultivated crops; however, it is limited by medium fertility and potentially toxic levels of exchangeable aluminum in the root zone. Erosion is a moderate hazard. The main suitable crops are cotton, corn, and wheat. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Where coarse fragments on the surface are too concentrated, seedbed preparation is difficult and seed germination is reduced. Sprinkler irrigation systems can be used to provide supplemental water to crops. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Terraces help to conserve moisture and control runoff and the risk of erosion. Most crops respond well to fertilizer and lime, which help to overcome the medium fertility and reduce the high levels of exchangeable aluminum.

This Darley soil is well suited to pasture. Medium fertility is a minor limitation for this use. The main suitable pasture plants are common bermudagrass, improved bermudagrass, crimson clover, tall fescue, bahiagrass, and ryegrass. Where practical, seedbed preparation should be on the contour or across the slope. Fertilizer and lime are needed for optimum production of forage. Periodic mowing and clipping help to maintain uniform growth, discourage selective grazing, and reduce clumpy growth.

This soil is moderately well suited to urban development. The main limitations are moderately slow permeability and the ironstone layers. Erosion is the main hazard. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. Plants are difficult to establish in areas where the clayey subsoil and ironstone layers are exposed. Mulching and fertilizing cut areas help to establish plants. The bottoms of lagoons need to be sealed to prevent seepage of effluent. Unless septic tank absorption lines are installed on the contour, effluent can surface in downslope areas and create a hazard to health.

This soil is poorly suited to recreational uses. It is limited mainly by small stones on the surface or in the surface layer. Steepness of slope is an additional limitation for playgrounds. Cuts and fills should be seeded or mulched to control erosion. The plant cover can be maintained by adding fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Darley soil is in capability subclass IIIe. The woodland ordination symbol is 8F.

DM=Darley gravelly fine sandy loam, 5 to 12 percent slopes

This soil is strongly sloping and well drained. It is on side slopes on uplands. The areas of this soil are irregular in shape and range from 30 to 250 acres. Fewer observations were made than in other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark brown gravelly fine sandy loam about 4 inches thick. The subsurface layer to a depth of about 12 inches is yellowish red gravelly fine sandy loam. The subsoil to a depth of about 60 inches is red clay in the upper part and alternating layers of ironstone and red, mottled clay in the lower part.

This soil has medium fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Permeability is moderately slow. The available water capacity is moderate to high. Runoff is rapid, and the hazard of erosion is severe. The shrink-swell potential is low. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Mahan, Ruston, and Sacul soils. Ruston soils are on convex ridgetops and are loamy throughout the profile. Mahan and Sacul soils are in landscape positions similar to those of the Darley soil, and they do not have ironstone layers in the subsoil. Also, Sacul soils have gray mottles in the upper part of the subsoil. The included soils make up about 15 percent of the map unit.

This Darley soil is used mainly as woodland. In a few areas, it is used as pastureland.

This soil is well suited to use as woodland and has few limitations for producing and harvesting timber. The potential for production of loblolly pine is moderately high. If site preparation is not adequate, competition from undesirable plants can prolong reestablishment of trees.

This soil is not suited to cultivated crops. The hazard of erosion is too severe for this use. However, if soils are adequately protected against erosion, less steeply sloping areas can be cropped. In places, stones on the surface hinder the use of equipment to a slight degree. Medium fertility and potentially toxic levels of exchangeable aluminum in the root zone are additional limitations. Wheat is the main crop grown. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. However, where coarse fragments are too numerous on the surface, seedbed preparation can be difficult and seed germination is reduced. Crop residue left on or near the surface helps to control runoff and maintain tilth and organic matter content. Crops respond well to fertilizer and lime, which help to overcome the medium fertility and reduce the high levels of exchangeable aluminum in the root zone.

This soil is moderately well suited to pasture (fig. 3). The main concern is the erosion hazard. Medium fertility is a minor limitation. In places, stones on the surface interfere with equipment operations to some degree. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, tall fescue, ryegrass, and crimson clover. Proper grazing practices, weed control, and fertilizer are needed for maximum quality of forage.

This soil is moderately well suited to urban development. The main limitations are moderately slow permeability, steepness of slope, ironstone layers, and

Figure 3.—A new pasture in a recently cleared area of Darley gravelly fine sandy loam, 5 to 12 percent slopes.

the clayey subsoil. Erosion is a hazard in the steeper areas. Only the part of the site that is used for construction should be disturbed. Plants are difficult to establish in areas where clayey subsoil and ironstone layers are exposed. Mulching and fertilizing cut areas help to establish plants. Effluent from septic tank absorption fields can surface in downslope areas and create a hazard to health. This hazard can be reduced by installing absorption lines on the contour.

This soil is poorly suited to recreational uses. Steepness of slope and small stones on the surface are limitations to most recreational uses. Cuts and fills should be seeded or mulched to control erosion. The plant cover can be maintained by applying fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Darley soil is in capability subclass VIe. The woodland ordination symbol is 8F.

DO=Darley gravelly fine sandy loam, 12 to 30 percent slopes

This soil is moderately steep and well drained. It is on side slopes on uplands. Slopes are short and irregular. The areas of this soil range from 40 to 300 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark brown gravelly fine sandy loam about 3 inches thick. The subsurface layer to a depth of about 10 inches is strong brown gravelly fine sandy loam. The subsoil to a depth of about 45 inches is red sandy clay in the upper part and alternating layers of ironstone and red clay in the lower part. The next layer to a depth of about 60 inches is mottled yellowish red and strong brown sandy clay loam.

This soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Permeability is moderately slow. The available water capacity is moderate to high. Water runs off the surface at a rapid rate. The shrink-swell potential is low. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Ruston, Mahan, and Sacul soils. Ruston soils are on narrow ridgetops and are loamy throughout the profile. Mahan and Sacul soils are in landscape positions similar to those of the Darley soil, and they do not have ironstone layers in the subsoil. Sacul soils have gray mottles in the upper part of the subsoil. The included soils make up about 10 percent of the map unit.

This Darley soil is used mainly as woodland. In a few areas, it is used as pastureland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is moderately high. The main limitations to producing and harvesting timber are a moderate equipment use limitation and a moderate erosion hazard because of the slope. Also, plant competition is moderate. Management that minimizes the risk of erosion is essential in harvesting timber. Roads and landings can be protected against erosion by constructing diversions and by seeding cuts and fills. In places, conventional methods of harvesting timber are difficult because of the slope. Proper site preparation controls initial growth of unwanted understory plants.

This soil is not suited to cultivated crops. The slopes are too steep and the hazard of erosion is too severe for this use. If adequately protected against erosion, the less sloping areas can be cropped. Where this soil is cultivated, terraces and conservation tillage help to control erosion.

This soil is poorly suited to pasture. The main limitations are the severe hazard of erosion and an equipment use limitation because of the slope. Common bermudagrass and bahiagrass can be grown. Native grasses are best suited to the more steeply sloping areas where seedbed preparation is difficult. Fertilizer and lime are needed for optimum production of forage.

This soil is poorly suited to urban development. The main limitation is steepness of slope. The ironstone layers and moderately slow permeability are additional limitations. Excavation for roads and buildings increases the hazard of erosion; therefore, disturbed areas around construction sites should be revegetated as soon as possible.

This soil is poorly suited to most intensive recreational uses. The main limitations are the severe hazard of erosion, small stones on the surface, and steepness of slope. Paths and trails should be on the contour or across the slopes to prevent excessive erosion.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Darley soil is in capability subclass VIe. The woodland ordination symbol is 8R.

ED=Eastwood very fine sandy loam, 5 to 12 percent slopes

This soil is strongly sloping and moderately well drained. It is on side slopes on uplands. The areas of this soil are irregular in shape and range from 20 to 200 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, this Eastwood soil has a dark grayish brown very fine sandy loam surface layer about 5 inches thick. The subsurface layer to a depth of about 9 inches is brown very fine sandy loam. The subsoil to a depth of about 60 inches is red clay in the upper part; red, mottled clay and silty clay in the middle part; and red, mottled silty clay loam in the lower part. The underlying material to a depth of about 65 inches is stratified brown and light brownish gray silty clay loam.

This soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a very slow rate. The available water capacity is moderate to high. Water runs off the surface at a rapid rate. The shrink-swell potential is high in the subsoil. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Angie, Darley, and Mahan soils. Angie soils are on broad, very gently sloping ridgetops and have a seasonal high water table. Darley and Mahan soils are on higher convex ridgetops than the Eastwood soil. They are also on side slopes. Darley soils have ironstone layers in the subsoil. Mahan soils have clay mineralogy that is different than the Eastwood soil. The included soils make up about 10 percent of the map unit.

This Eastwood soil is used mainly as woodland. In a few small areas, this soil is used as pastureland or hayland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is high. The main concern in producing and harvesting timber is the moderate equipment use limitation caused by the clayey subsoil. Soil compaction is also a hazard if logging is done when the soil is moist. Conventional methods of harvesting timber generally are suitable, but equipment use is limited during wet periods.

This soil is not suited to cultivated crops. The hazard of erosion is too severe for this use. The main soil limitations are low fertility and potentially toxic levels of exchangeable aluminum in the root zone.

This soil is moderately well suited to pasture. Steepness of slope and low fertility are the main limitations. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. Seedbed preparation should be on the contour or across the slope where practical. Fertilizer and lime are needed for optimum production of forage.

This soil is poorly suited to urban development because of very slow permeability, the clayey subsoil, high shrink-swell potential, steepness of slope, and low strength for roads. Preserving the existing plant cover during construction helps to control erosion. Very slow permeability is a limitation where this soil is used as septic tank absorption fields. This limitation can be partly overcome by increasing the size of the absorption field. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Roads should be designed to offset the limited ability of the soil to support a load.

This soil is poorly suited to most intensive recreational uses mainly because of very slow permeability and steepness of slope. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover. The cover can be maintained by adding fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Small clear-cuts in irregular shapes provide maximum edge for use by deer.

This Eastwood soil is in capability subclass VIe. The woodland ordination symbol is 9C.

Fr=Frizzell silt loam

This soil is nearly level and somewhat poorly drained. It is on broad flats on low terraces. The areas of this soil are irregular in shape and range from about 20 to 1,000 acres. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown silt loam about 4 inches thick. The next layer to a depth of about 24 inches is yellowish brown, mottled silt loam and interfingers of light brownish gray silt loam. The subsoil to a depth of about 60 inches is yellowish brown and mottled. It is silt loam in the upper part, silty clay loam in the middle part, and silt loam in the lower part.

This Frizzell soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to crops. Water and air move through this soil at a slow rate. Water runs off the surface at a slow rate. A seasonal high water table ranges from 1.5 to 4 feet below the surface from December to April. The available water capacity is high. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Guyton, Libuse, and Savannah soils. Guyton soils are in depressions. They are grayish throughout the profile. Libuse and Savannah soils are higher on the landscape than the Frizzell soil and have a fragipan. The included soils make up about 15 percent of the map unit.

This Frizzell soil is used mainly as woodland. Small acreages are used as pastureland, cropland, or homesites.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is high. The main concern in producing and harvesting timber is a restricted use of equipment during wet periods. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Conventional methods of harvesting timber generally are suitable, but the soil may be compacted if it is wet and heavy equipment is used.

This soil is moderately well suited to cultivated crops. The main limitations are wetness, low fertility, and potentially toxic levels of exchangeable aluminum in the root zone. The main crops are truck crops. A drainage system can improve this soil for most cultivated crops. Most crops respond well to fertilizer and lime, which improve the fertility and reduce the high levels of exchangeable aluminum in the root zone.

This soil is well suited to pasture. The main limitations are wetness and low natural fertility. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, tall fescue, white clover, vetch, and winter peas. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant cover. Proper grazing, weed control, and fertilizer are needed for optimum growth of grasses and legumes.

This soil is moderately well suited to urban and recreational uses. Wetness and slow permeability are the main limitations. Drainage can improve this soil for use as roads or buildings. Excess water can be removed by using shallow drains and providing the proper grade for drainage. Septic tank absorption fields do not function properly during rainy periods because of wetness and slow permeability. Self-contained disposal units can be used to dispose of sewage properly.

This soil has good potential as habitat for woodland and openland wildlife and fair potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This Frizzell soil is in capability subclass IIw. The woodland ordination symbol is 9W.

Gm=Groom silt loam, occasionally flooded

This soil is level and poorly drained. It is on broad flats on low stream terraces adjacent to the flood plain of the Ouachita River. The areas of this soil are irregular in shape and range from about 30 to 800 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is grayish brown silt loam about 3 inches thick. The next layer to a depth of about 11 inches is grayish brown, mottled silt loam. The subsoil to a depth of about 21 inches is gray, mottled silty clay loam. The subsoil between depths of about 21 and 60 inches is grayish brown, mottled silty clay loam.

This Groom soil has low fertility. It contains high levels of exchangeable aluminum in the root zone that are potentially toxic to crops. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table ranges from the surface to a depth of about 1 foot below the surface during November through July. This soil is subject to long periods of flooding during November through July. High levels of sodium are in the lower part of the subsoil. The available water capacity is high to very high. The shrink-swell potential is moderate.

Included with this soil in mapping are a few small areas of Guyton, Portland, and Wrightsville soils. Guyton soils are on narrow flood plains and in depressions. They are grayish throughout the profile. Portland soils are on flood plains and have a clayey subsoil. Wrightsville soils are in landscape positions similar to those of the Groom soil and have a loamy and clayey subsoil. The included soils make up about 15 percent of the map unit.

This Groom soil is used mainly as woodland. In a few areas, it is used as pastureland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine and hardwoods is moderately high. Wetness limits the use of equipment and reduces seedling survival. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees. Site preparation and harvesting can be done only during dry periods to reduce rutting and soil compaction.

This soil is poorly suited to cultivated crops. The main limitations are wetness, low fertility, and high levels of exchangeable aluminum in the root zone. Flooding is the main hazard. Soybeans and rice are the main crops. A drainage system is needed for most cultivated crops. Flooding can be reduced by major flood-control structures such as levees. Most crops respond well to fertilizer and lime, which improve fertility and reduce the high levels of exchangeable aluminum in the root zone. Crop residue left on or near the surface helps to maintain tilth and organic matter content.

This soil is moderately well suited to pasture. The main limitations are wetness and low fertility. Flooding is a hazard. Suitable pasture plants are common bermudagrass, ryegrass, bahiagrass, vetch, winter peas, and white clover. Grazing when the soil is wet results in compaction of the surface layer. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is poorly suited to urban and recreational uses. Unless flooding is controlled, this soil is not suited to homesites. The main limitations are wetness, moderately slow permeability, and low strength for roads and streets. A drainage system is needed if roads and building foundations are constructed. Septic tank absorption fields do not function properly during rainy periods because of wetness and moderately slow permeability. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly. Proper design of roads can offset the limited ability of the soil to support loads.

This soil has fair potential as habitat for openland, woodland, and wetland wildlife. Management that enhances the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Habitat for waterfowl and furbearers can be improved by constructing shallow ponds.

This Groom soil is in capability subclass IVw. The woodland ordination symbol is 5W.

GO=Groom silty clay loam, frequently flooded

This soil is level and poorly drained. It is on broad flats on low stream terraces adjacent to the flood plain of the Ouachita River. The areas of this soil are irregular in shape and range from about 50 to 400 acres. Slopes are dominantly less than 1 percent. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is grayish brown silty clay loam about 6 inches thick. The next layer to a depth of about 16 inches is grayish brown, mottled silt loam. The subsoil to a depth of about 24 inches is gray, mottled silty clay loam. The next part of the subsoil to a depth of about 60 inches is grayish brown, mottled silty clay loam.

This Groom soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to crops. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table ranges from the surface to about 1 foot below the surface during November through July. This soil is frequently flooded for long periods by overflow from streams (fig. 4). The depth of floodwater is generally less than 5 feet. The available water capacity is high to very high. The shrink-swell potential is moderate.

Included with this soil in mapping are a few small areas of Haggerty, Litro, Perry, and Portland soils. Litro, Perry, and Portland soils are in lower positions and have a clayey or a loamy and clayey subsoil. Haggerty soils are in landscape positions similar to those of the Groom soil and have a loamy and sandy subsoil.

This Groom soil is used mainly as woodland. A small acreage is used as pastureland.

This soil is moderately well suited to use as woodland. The potential for production of hardwoods is moderate. Pine trees generally do not grow well on this soil. The main concerns in producing and harvesting timber are seedling mortality and a restricted use of equipment caused by wetness and frequent overflow, especially during November through July. Also, plant competition is moderate. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees. Water-tolerant trees can be planted or harvested during dry periods.

This soil is not suited to cultivated crops because of the hazard of frequent flooding. It is also limited by wetness, low fertility, and high levels of exchangeable aluminum in the root zone. Major structures, such as levees and water pumps, are needed to adequately control flooding and provide drainage.

This soil is moderately well suited to pasture. The main limitations are wetness and low fertility. Flooding is a hazard. Suitable pasture plants are common bermudagrass, ryegrass, bahiagrass, vetch, winter peas, and white clover. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. During periods of flooding,

Figure 4.—Flooding in an area of Groom silty clay loam, frequently flooded.

cattle can be moved to adjacent protected areas or to pastures at higher elevations. Grasses and legumes respond well to fertilizer and lime if they are applied often and in small amounts.

This soil is poorly suited to urban and recreational uses. It is not suited to homesites because of frequent flooding. The main limitations are wetness, moderately slow permeability, and low strength for roads and streets. Flooding can be controlled by use of major flood-control structures. Roads and streets should be located above the expected flood level and designed to offset the limited ability of the soil to support a load. Septic tank absorption fields do not function properly during rainy periods because of wetness and moderately slow permeability. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly.

This soil has fair potential as habitat for openland, woodland, and wetland wildlife. Management that enhances the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Habitat for waterfowl and furbearers can be improved by constructing shallow ponds.

This Groom soil is in capability subclass Vw. The woodland ordination symbol is 5W.

Gu=Guyton silt loam

This soil is level and poorly drained. It is on broad flats and in depressions on high and low terraces. The areas of this soil are irregular in shape and range from about 20 to 800 acres. Slopes are less than 1 percent.

Typically, the surface layer is light brownish gray, mottled silt loam about 4 inches thick. The subsurface layer to a depth of about 19 inches is light gray, mottled silt loam. The next layer to a depth of about 28 inches is grayish brown, mottled silty clay loam and tongues of light gray silt loam. The subsoil to a depth of about 60 inches is grayish brown silty clay loam in the upper part, light brownish gray silt loam in the middle part, and grayish brown silt loam in the lower part.

This Guyton soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to crops. Water and air move through this soil at a slow rate. Water runs off the surface at a slow to very slow rate. A seasonal high water table ranges from the surface to a depth of about 1.5 feet during December through May. The available water capacity is high to very high. High levels of sodium are in the soil between depths of 52 and 60 inches. This soil is subject to rare flooding. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Frizzell and Libuse soils. Frizzell and Libuse soils are on terraces higher on the landscape than the Guyton soil. Libuse soils have a fragipan. Frizzell soils have a brownish subsoil. The included soils make up about 15 percent of the map unit.

This Guyton soil is used mainly as woodland. A small acreage is used as pastureland.

This soil is moderately well suited to the production of loblolly pine and hardwoods. Wetness limits the use of equipment. Trees should be water-tolerant and planted or harvested during dry periods. Conventional methods of harvesting timber generally are suitable, but the soil may be compacted if it is wet and heavy equipment is used. Drainage and special site preparation, such as bedding and harrowing, help to establish seedlings. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants.

This soil is moderately well suited to cultivated crops. The main limitations are wetness, high levels of exchangeable aluminum in the root zone, and low fertility. Soybeans, rice, and small grains are the main crops. Drainage can improve this soil for most cultivated crops. Most crops respond to fertilizer and lime, which improve soil fertility and reduce the high levels of exchangeable aluminum in the root zone.

This soil is moderately well suited to pasture. The main limitations are wetness and low natural fertility. Suitable pasture plants are common bermudagrass, bahiagrass, white clover, winter peas, and vetch. Wetness limits the choice of plants and the period of grazing. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant cover. Periodic mowing and clipping help to maintain uniform growth, discourage selective grazing, and reduce clumpy growth. Pasture grasses respond well to fertilizer, and legumes respond to lime.

This soil is poorly suited to urban and recreational uses. Seasonal wetness is the main limitation, and flooding is a hazard. A drainage system is needed if roads and building foundations are constructed. Septic tank absorption fields do not function properly during rainy periods because of wetness and slow permeability. Low strength is a limitation for roads and streets.

This soil has good potential as habitat for wetland wildlife and fair potential as habitat for openland and woodland wildlife. Habitat for wildlife is easily improved, maintained, or created. There are few soil limitations affecting management or development of habitat. Management that enhances the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Habitat for waterfowl and furbearers can be created by constructing shallow ponds.

This Guyton soil is in capability subclass IIIw. The woodland ordination symbol is 8W.

GY=Guyton silt loam, frequently flooded

This soil is level and poorly drained. It is in low positions on flood plains of major streams and local drainageways. The areas of this soil are irregular in shape and range from 25 to 2,500 acres in size. Slopes are less than 1 percent. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark grayish brown and dark brown silt loam about 8 inches thick. The subsurface layer to a depth of 16 inches is brown and light brownish gray, mottled silt loam. The next layer to a depth of about 28 inches is light brownish gray, mottled silt loam with tongues of light gray silt loam. The subsoil to a depth of about 60 inches is light brownish gray and light gray, mottled silt loam and silty clay loam. In places, a thin or thick overwash of brown loamy alluvium is on the surface.

This Guyton soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Water runs off the surface at a slow to very slow rate. A seasonal high water table ranges from the surface to a depth of about 1.5 feet during December through May. This soil is subject to flooding for very brief to long periods during any time of the year. The available water capacity is high to very high. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Cahaba soils on low stream terraces and many small areas of Iuka and Ochlockonee soils on flood plains. Cahaba soils are well drained and have a reddish subsoil. Iuka and Ochlockonee soils are on low ridges and natural levees. These soils contain more sand throughout the profile than the Guyton soil. The included soils make up about 15 percent of the map unit.

This Guyton soil is used mainly as woodland. In a few areas, it is used as pastureland.

This soil is moderately well suited to use as woodland. The potential for production of hardwoods is high. Pine trees are generally not suitable to plant because of the high rate of seedling mortality caused by wetness and flooding. Wetness also limits the use of equipment. Also, competition from unwanted understory plants is severe. Trees should be water-tolerant and planted or harvested during dry periods. Conventional methods of harvesting timber can be used except sometimes during rainy periods, generally from December to May. Logging should be done in the drier periods to prevent excessive rutting and reduce soil compaction.

This soil is not suited to cultivated crops because of the hazard of flooding. Soil limitations are wetness, low fertility, and potentially toxic levels of exchangeable aluminum in the root zone. Late-planted crops, such as soybeans and grain sorghum, can be grown in some years. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps.

This soil is poorly suited to pasture. It is difficult to establish pasture grasses because of flooding, wetness, and low soil fertility. Wetness also limits the choice of plants and the period of grazing. The main suitable pasture plants are common bermudagrass, singletary peas, and vetch. Native grasses can also provide adequate forage for grazing cattle. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. During periods of flooding, cattle can be moved to pastures at higher elevations.

This soil is poorly suited to urban and recreational uses. It is not suited to building sites. Wetness is the main limitation, and flooding is a hazard. Major flood-control structures, along with extensive local drainage systems, are needed to control flooding and remove excess water. Roads and streets should be located above the expected flood level and designed to offset the limited ability of the soil to support a load.

This soil has fair potential as habitat for woodland wildlife, poor potential as habitat for openland wildlife, and good potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Habitat for waterfowl and furbearers can be improved by constructing shallow ponds.

This Guyton soil is in capability subclass Vw. The woodland ordination symbol is 6W.

GZ=Guyton-Ouachita silt loams, frequently flooded

These soils are level to nearly level and are on the flood plains of major streams. The Guyton soil is poorly drained and is in level and depressional areas. The Ouachita soil is well drained and is on low ridges or natural levees that are 2 to 6 feet high and 25 to 150 feet wide. The Guyton soil has slopes of less than 1 percent, and the Ouachita soil has slopes that range from 0 to 2 percent. The areas of these soils are irregular in shape and range from 40 to 2,000 acres. They are about 50 percent Guyton soil and 25 percent Ouachita soil. These soils are frequently flooded during any time of the year. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soils.

Typically, this Guyton soil has a surface layer of brown, mottled silt loam about 6 inches thick. The subsurface layer to a depth of about 29 inches is light brownish gray, mottled silt loam. The subsoil to a depth of about 60 inches is grayish brown, mottled silty clay loam. In places, a thick or thin overwash of brown loamy alluvium is on the surface.

This Guyton soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Water runs off the surface at a slow to very slow rate. A seasonal high water table ranges from the surface to a depth of about 1.5 feet during December through May. This soil is frequently flooded for very brief to long periods during any time of the year. Depth of floodwater ranges from 1 to 8 feet. The available water capacity is high to very high. The shrink-swell potential is low.

Typically, this Ouachita soil has a surface layer of dark brown silt loam about 2 inches thick. The next layer to a depth of about 9 inches is brown silt loam. The subsoil to a depth of about 43 inches is dark yellowish brown silt loam in the upper part, brown silt loam in the middle part, and yellowish brown and grayish brown silt loam in the lower part. The next layer to a depth of about 55 inches is a buried subsurface layer of light brownish gray, mottled very fine sandy loam. Below this to a depth of about 60 inches is a buried subsoil of grayish brown, mottled silty clay loam.

This Ouachita soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate. Flooding occurs frequently for very brief to long periods. The available water capacity is high to very high. A seasonal high water table is more than 6 feet below the surface throughout the year. The shrink-swell potential is low.

Included with the Guyton and Ouachita soils in mapping are a few small areas of Harleston and Smithton soils and many small areas of Iuka and Ochlockonee soils. Harleston and Smithton soils are on low stream terraces. Iuka and Ochlockonee soils are in landscape positions similar to those of the Ouachita soil. Harleston, Iuka, and Ochlockonee soils contain more sand throughout the profile than the Guyton and Ouachita soils. Also, Harleston soils are moderately well drained and have a well developed subsoil. Smithton soils are poorly drained and have a well developed subsoil that is light brownish gray and gray. The included soils make up about 15 percent of the map unit.

The Guyton and Ouachita soils are used mainly as woodland. In a few areas, they are used as pastureland or cropland.

These soils are moderately well suited to use as woodland. The potential for production of loblolly pine and hardwoods is high. However, wetness limits the use of equipment, and seedling mortality is moderate to high because of wetness from flooding and a seasonal high water table. Pine trees are generally not suitable to plant on the Guyton soil because of the high rate of seedling mortality. Conventional methods of harvesting timber cannot be used during rainy periods, generally from December to May. Logging should be done in the drier periods to prevent excessive rutting and reduce soil compaction. Proper site preparation controls initial growth of unwanted understory plants, and spraying, cutting, and girdling controls subsequent growth.

The Guyton and Ouachita soils are not suited to cultivated crops. The hazard of flooding is too severe for this use. The main soil limitations are wetness, low fertility, and potentially toxic levels of exchangeable aluminum in the root zone. Late-planted crops, such as soybeans and grain sorghum, can be grown in some years. Major structures, such as levees, are needed to adequately control flooding.

These soils are poorly suited to pasture. Pasture grasses are difficult to establish because of flooding, wetness, and low soil fertility. Wetness also limits the choice of plants and the period of grazing. The main suitable pasture plants are common bermudagrass, singletary peas, and vetch. Native grasses can also provide adequate forage for grazing cattle. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

These soils are poorly suited to urban and intensive recreational uses. They are not suited to use as building sites. Wetness is the main limitation, and flooding is a hazard. Roads and streets should be located above the expected flood level and designed to offset the limited ability of the soil to support a load. Major flood-control structures, along with extensive local drainage systems, are needed to control flooding and to remove excess water.

The Guyton soil in this map unit has fair potential as habitat for woodland wildlife, poor potential as habitat for openland wildlife, and good potential as habitat for wetland wildlife. The Ouachita soil in this map unit has good potential as habitat for woodland wildlife and fair potential as habitat for openland and wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Habitat for waterfowl and furbearers can be improved in areas of the Guyton soil by constructing shallow ponds.

The Guyton and Ouachita soils are in capability subclass Vw. The woodland ordination symbol is 6W for the Guyton soil and 11W for the Ouachita soil.

HA=Haggerty fine sandy loam, frequently flooded

This soil is level and somewhat poorly drained. It is on low terraces that are former beaches of relict lakes. The areas of this soil are mainly along the western edge of the flood plain of the Ouachita River. The areas of this soil are irregular in shape and range from about 20 to 250 acres. Slopes are dominantly less than one percent. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark grayish brown, mottled fine sandy loam about 8 inches thick. From top to bottom, the layers of the subsoil to a depth of about 40 inches are grayish brown, mottled fine sandy loam; pale brown, mottled fine sandy loam; light brownish gray, mottled fine sandy loam; and light gray, mottled loamy fine sand. The substratum to a depth of about 60 inches is light gray, mottled loamy fine sand.

This Haggerty soil has low fertility. It contains high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderately rapid rate. Water runs off the surface at a very slow rate. A seasonal high water table ranges from the surface to a depth of about 1.5 feet during November through June. This soil is subject to very long periods of flooding during November through July. The depth of floodwater typically ranges from 2 to 10 feet, but it may exceed 10 feet some years. The available water capacity is low to high. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Groom, Litro, and Perry soils. Groom soils are in landscape positions similar to those of the Haggerty soil, and Litro and Perry soils are in lower positions. All of these soils contain more clay in the subsoil than the Haggerty soil. The included soils make up about 10 percent of the map unit.

All areas of this Haggerty soil are used as woodland.

This soil is moderately well suited to use as woodland, mainly hardwoods. Flooding and wetness severely limit the use of equipment and cause severe seedling mortality. Trees should be water-tolerant and planted and harvested during dry periods. Soil droughtiness in the summer can limit the seedling survival rates in areas where understory plants are numerous.

This soil is not suited to cultivated crops because of wetness and the hazard of flooding. Additional soil limitations are low fertility and potentially toxic levels of exchangeable aluminum in the root zone. Flooding can be controlled, but only by major flood-control structures, such as levees and water pumps.

This soil is poorly suited to pasture. Seasonal wetness, droughtiness in summer and fall, and low fertility are the main limitations. Flooding is a hazard. Suitable pasture plants are common bermudagrass, white clover, vetch, and winter peas. During periods of flooding, cattle can be moved to adjacent protected areas or to pastures at higher elevations. It is generally not practical to apply high amounts of fertilizer and lime because of the frequent flooding.

This soil is poorly suited to most urban and recreational uses. Wetness is the main limitation, and flooding is a hazard. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps.

This soil has fair potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Haggerty soil is in capability subclass Vw. The woodland ordination symbol is 2W.

HB=Haggerty silty clay loam, frequently flooded

This soil is level and somewhat poorly drained. It is on low terraces that are former beaches of relict lakes. The areas of this soil are mainly along the western edge of the flood plain of the Ouachita River. The areas of this soil are irregular in shape and range from about 30 to 500 acres. Slopes are dominantly less than 1 percent. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark grayish brown, mottled silty clay loam about 7 inches thick. The subsoil to a depth of about 37 inches is light brownish gray, mottled fine sandy loam in the upper part; pale brown, mottled fine sandy loam in the middle part; and light gray, mottled loamy fine sand in the lower part. The substratum to a depth of about 60 inches is light gray, mottled sand.

This Haggerty soil has low fertility. It contains high levels of exchangeable aluminum in the root zone. Water and air move through the surface layer of this soil at a slow rate and through the subsoil at a moderately rapid rate. Water runs off the surface at a very slow rate. A seasonal high water table ranges from the surface to a depth of about 1.5 feet during November through June. This soil is subject to very long periods of flooding during November through July. Floodwaters typically are 5 to 10 feet deep, but they can exceed 15 feet some years. The shrink-swell potential is high in the surface layer and low in the subsoil. The available water capacity is low to high.

Included with this soil in mapping are a few small areas of Groom, Litro, and Perry soils. Groom soils are in landscape positions similar to those of the Haggerty soil, and Litro and Perry soils are in lower positions. All of these soils contain more clay in the subsoil than the Haggerty soil. The included soils make up 10 percent of the map unit.

All areas of this Haggerty soil are used as woodland.

This soil is moderately well suited to use as woodland, mainly hardwoods (fig. 5). Frequent flooding and wetness severely limit the use of equipment and cause severe seedling mortality. Trees should be water-tolerant and planted or harvested during dry periods. Soil droughtiness in summer and fall can limit tree growth and the survival rate of seedlings.

This soil is not suited to cultivated crops because of wetness and the hazard of frequent flooding. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps.

This soil is poorly suited to pasture. It is limited mainly by flooding, seasonal wetness, and low fertility. Droughtiness in summer and fall is also a limitation. Suitable pasture plants are common bermudagrass, johnsongrass, white clover, vetch, and winter peas. During periods of flooding, cattle can be moved to protected areas or to pastures at higher elevations. Pasture grasses respond well to fertilizer and lime if they are applied often and in small amounts.

This soil is poorly suited to urban and recreational uses. It is generally not suited to dwellings because of the hazard of frequent flooding. The main soil limitation is wetness. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps.

This soil has fair potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Haggerty soil is in capability subclass Vw. The woodland ordination symbol is 2W.

Figure 5.—Hardwood trees in an area of Haggerty silty clay loam, frequently flooded. (Note high water marks on trees in the foreground.)

Hd=Harleston fine sandy loam, 1 to 3 percent slopes

This soil is very gently sloping and moderately well drained. It is on low stream terraces. The areas of this soil are narrow or irregular in shape and range from 20 to 300 acres.

Typically, this Harleston soil has a grayish brown fine sandy loam surface layer about 2 inches thick. The subsurface layer to a depth of about 10 inches is pale brown, mottled fine sandy loam. The next layer to a depth of about 17 inches is yellowish brown fine sandy loam. From top to bottom, the layers of the subsoil to a depth of about 60 inches are yellowish brown, mottled sandy loam; yellowish brown, mottled sandy clay loam; mottled yellowish brown, strong brown, and light brownish gray sandy clay loam; and yellowish brown, mottled loam.

This soil has low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through the soil at a moderate rate. Water runs off the surface at a medium rate. A seasonal high water table is 2 to 3 feet below the surface from November to March. The available water capacity is moderate to high. The shrink-swell potential is low. This soil is subject to rare flooding.

Included with this soil in mapping are a few small areas of Cahaba and Guyton soils. Cahaba soils are slightly higher on the landscape than those of the Harleston soil. They are well drained and have a reddish subsoil. Guyton soils are in broad depressional areas and in shallow drainageways. They are poorly drained and are grayish throughout the profile. The included soils make up about 10 percent of the map unit.

This Harleston soil is used mainly as woodland. Small acreages are used as pastureland or cropland.

This soil is well suited to use as woodland. The potential for production of loblolly pine is high. This soil has few limitations for use and management; however, logging during the drier periods helps to prevent rutting and soil compaction. Plant competition is moderate. Proper site preparation controls initial plant competition, and spraying controls subsequent growth.

This soil is well suited to cultivated crops; however, low fertility, steepness of slope, and potentially toxic levels of exchangeable aluminum in the root zone are limitations. Erosion is a moderate hazard. Suitable crops are cotton, corn, and wheat. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. A sprinkler irrigation system works well on this soil. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by subsoiling when the soil is dry. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Crops respond well to lime and fertilizer, which improve soil fertility and reduce the moderately high levels of exchangeable aluminum. Early fall seeding, conservation tillage, terraces, diversions, and grassed waterways help to control erosion.

This soil is well suited to pasture and has few limitations for this use. Low fertility is a minor limitation. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. Proper grazing, weed control, and fertilizer are needed for maximum quality of forage.

This Harleston soil is moderately well suited to urban development. Wetness is the main limitation, and flooding and erosion are the main hazards. Preserving the existing plant cover during construction helps to control erosion. Establishing and maintaining the plant cover can be achieved through proper fertilizing, seeding, mulching, and shaping of the slopes. Drainage can be provided around buildings to remove excess water. Flooding can be controlled, but only by major flood- control structures, such as levees and water pumps.

This soil is moderately well suited to recreational uses. Wetness is the main limitation. Steepness of slope is an additional limitation for playgrounds. Flooding is a hazard to camp areas. Drainage can improve this soil for most intensive recreational uses. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover. The cover can be maintained by adding fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Harleston soil is in capability subclass IIe. The woodland ordination symbol is 9W.

He=Hebert silt loam, occasionally flooded

This soil is level and somewhat poorly drained. It is on broad flats and on the backslopes of natural levees within the flood plains of the Ouachita River and its distributaries. The areas of this soil are irregular in shape and range from about 10 to more than 300 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsurface layer to a depth of about 10 inches is brown, mottled silt loam. From top to bottom, the layers of the subsoil to a depth of about 45 inches are brown, mottled silty clay loam; grayish brown, mottled silty clay loam; brown, mottled silty clay loam; and reddish brown, mottled silty clay loam. The substratum to a depth of about 60 inches is reddish brown, mottled silty clay loam.

Included with this soil in mapping are a few small areas of Perry, Portland, and Sterlington soils. Perry and Portland soils are lower on the landscape than the Hebert soil and have a clayey subsoil. Sterlington soils are in higher positions and have a subsoil that is browner in the upper part. The included soils make up about 15 percent of the map unit.

This Hebert soil has medium natural fertility. It has moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table is about 1.5 to 3 feet below the surface during December through April. This soil is occasionally flooded for brief to very long periods from December to April. The shrink-swell potential is moderate. The available water capacity is high to very high.

This Hebert soil is used mainly as woodland. Small acreages are used as pastureland, homesites, or for cultivated crops.

This soil is well suited to use as woodland. It has high potential to produce hardwoods. Few areas, however, remain in woodland. Flooding and wetness limit the use of equipment and cause moderate seedling mortality. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Soil compaction can be reduced by laying out skid trails in advance and harvesting timber when the soil is least susceptible to compaction. Drainage or special site preparation, such as harrowing and bedding, help to establish seedlings, reduce seedling mortality, and increase seedling growth.

This soil is moderately well suited to cultivated crops; however it is limited by wetness, medium fertility, and moderately high levels of exchangeable aluminum. Flooding is a hazard. Planting dates are delayed and crops are damaged by floods in some years. Suitable crops are cotton, soybeans, corn, and small grains. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Proper row arrangement, field drains, and grassed outlets help to remove excess surface water. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by deep plowing or chiseling when the soil is dry. Returning crop residue to the soil or regularly adding other organic material improves fertility, reduces crusting, and increases the water intake rate. Some crops respond well to fertilizer and lime, which improve soil fertility and reduce the levels of exchangeable aluminum. Flooding can be reduced by using levees, diversions, and water pumps.

This soil is moderately well suited to pasture. The main limitation is wetness. Flooding limits the choice of plants and the period of grazing somewhat. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ryegrass, white clover, red clover, vetch, and winter peas. Grazing when the soil is wet can compact the surface layer. Periodic mowing and clipping help to maintain uniform growth, discourage selective grazing, and reduce clumpy growth of grasses and legumes.

This soil is poorly suited to urban development, mainly because of wetness and the hazard of flooding. Unless flooding is controlled, this soil is not suited to homesites. Moderate shrink-swell potential and wetness are limitations if this soil is used as homesites. Low strength is a limitation for roads and streets, and wetness is the main limitation for most sanitary facilities. A drainage system is needed if building foundations are constructed. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Septic tank absorption lines do not function properly during rainy periods because of wetness and moderately slow permeability. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly. Flooding can be reduced by constructing levees, diversions, and water pumps. Roads and streets can be designed to overcome the limited ability of the soil to support a load.

This soil is moderately well suited to recreational uses. The main limitations are wetness and moderately slow permeability. Flooding is a hazard to most recreational uses.

This soil has good potential as habitat for woodland wildlife and fair potential as habitat for openland and wetland wildlife. Habitat for openland wildlife species, such as quail, doves, and rabbits, can be improved by providing undisturbed, vegetated areas, such as field borders. Management that enhances the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Hebert soil is in capability subclass IIIw. The woodland ordination symbol is 8W.

HP=Hebert-Perry soils, frequently flooded

These soils are somewhat poorly drained and poorly drained. They are on the flood plains of the Ouachita River. These soils are frequently flooded for brief to very long periods, mainly in the spring and after unusually heavy rainfalls. The Hebert soil is on the higher positions, such as narrow ridges; and the Perry soil is in swales and other low positions. The areas of these soils are irregular in shape and range from about 20 to 100 acres. They are about 50 percent Hebert soil and 30 percent Perry soil. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soils. The Hebert soil has slopes that range from 0 to 3 percent. The Perry soil has slopes of less than 1 percent.

Typically, the Hebert soil has a surface layer of dark grayish brown silt loam about 4 inches thick. The subsurface layer to a depth of about 10 inches is grayish brown silt loam. The subsoil to a depth of about 60 inches is brown, mottled silt loam in the upper part; brown and light brown, mottled silty clay loam in the middle part; and reddish brown, mottled silty clay loam in the lower part.

This Hebert soil has medium fertility. It has moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderately slow rate. Water runs slowly off the surface. A seasonal high water table is about 1.5 to 3 feet below the surface during December through April. Floodwaters typically are 3 to 25 feet deep. The shrink-swell potential is moderate. The available water capacity is high to very high.

Typically, the Perry soil has a surface layer of dark gray clay about 9 inches thick. The upper part of the subsoil to a depth of about 42 inches is gray, mottled clay. The lower part to a depth of about 60 inches is reddish brown, mottled clay.

This Perry soil has medium fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a very slow rate. Water runs slowly off the surface. A seasonal high water table ranges from the surface to about 2 feet below the surface during December through June. Floodwaters typically are 5 to 30 feet deep. The shrink-swell potential is very high. During dry periods of most years, cracks that are 0.5 to 3 inches wide extend from the surface to a depth of 20 inches or more. The available water capacity is high.

Included with these soils in mapping are a few small areas of Portland and Sterlington soils. Portland soils are slightly higher on the landscape than the Perry soil and are reddish brown throughout the subsoil. Sterlington soils are higher on the landscape than the Hebert soil and are loamy throughout the subsoil. The included soils make up about 10 percent of the map unit.

These Hebert and Perry soils are used mainly as woodland or pastureland.

These soils are moderately well suited to use as woodland. Wetness and flooding severely restrict the use of equipment during the winter and spring. Also, seedling mortality is moderate because of wetness. Plant competition is moderate. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Harvesting can be done during dry periods to reduce rutting and soil compaction. Using special planting stock that is larger than normal can improve seedling survival.

The soils in this map unit are not suited to cultivated crops because of the hazard of frequent flooding. Wetness and poor tilth are the main soil limitations. Medium fertility is a minor limitation. Moderately high levels of exchangeable aluminum in the root zone are potentially toxic to crops. Only late-planted crops, such as grain sorghum and soybeans can be grown. Surface drainage can be improved by constructing shallow ditches or by smoothing the land surface and providing the proper grade. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps.

The soils in this map unit are poorly suited to pasture. The main limitations are wetness from frequent flooding and a seasonal high water table. The main suitable pasture plant is common bermudagrass. During periods of flooding, cattle can be moved to pastures protected from flooding to pastures at higher elevations. It is generally not practical to apply high rates of fertilizer or lime to pastures because of the hazard of overflow.

These soils are poorly suited to urban development. They are not suited to dwellings because of the hazard of flooding. Other soil limitations are moderately slow to very slow permeability, low strength for roads and streets, and moderate to very high shrink-swell potential.

These soils are poorly suited to recreational uses because of wetness and the hazard of flooding. Also, the surface layer of the Perry soil is sticky when wet.

The soils in this map unit have fair potential as habitat for wetland and openland wildlife and good potential as habitat for woodland wildlife. Management that enhances the growth of oak and other mast-producing trees can improve the habitat for white-tailed deer and squirrels. Habitat for waterfowl and furbearers can be improved by constructing shallow ponds. Habitat for openland wildlife species, such as rabbits, quail, and doves, can be improved by creating small, undisturbed areas of appropriate vegetation near cropland.

The Hebert and Perry soils in this map unit are in capability subclass Vw. The woodland ordination symbol is 7W for the Hebert soil and 2W for the Perry soil.

ID=Iuka-Ochlockonee complex, frequently flooded

These soils are level and nearly level and are moderately well drained. They are on flood plains along the major streams. The Iuka soil is level and is on flats and in low positions on natural levees. The Ochlockonee soil is nearly level and is on ridges or natural levees that are 1 to 6 feet high and 50 to 200 feet wide. The areas of these soils are irregular in shape and range from 25 to 2,500 acres. They are about 50 percent Iuka soil and 30 percent Ochlockonee soil. These soils are frequently flooded from stream overflow. Slopes range from 0 to 2 percent. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soils.

Typically, this Iuka soil has a surface layer of dark brown fine sandy loam about 6 inches thick. From top to bottom, the layers of the underlying material to a depth of about 60 inches are brown, mottled fine sandy loam; yellowish brown, mottled loam; mottled light brownish gray and yellowish brown fine sandy loam; light brownish gray, mottled loamy fine sand; and light gray, mottled loamy fine sand. In places, the soil is underlain at moderate depths by a buried subsoil of gray silty clay loam or silt loam.

The Iuka soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Permeability is moderate. A seasonal high water table is 1 to 3 feet below the surface from December to April. Water runs off the surface at a slow rate. This soil is frequently flooded for very brief to brief periods during December through April. The shrink-swell potential is low. The available water capacity is moderate to high.

Typically, the Ochlockonee soil has a surface layer of dark brown fine sandy loam about 8 inches thick. The next layer to a depth of about 24 inches is dark brown fine sandy loam. The underlying material to a depth of about 55 inches is pale brown loamy fine sand in the upper part and yellowish brown loamy fine sand in the lower part. Below this, to a depth of about 60 inches is a buried subsoil. It is mottled strong brown and light gray sandy clay loam.

The Ochlockonee soil is low in natural fertility. Water and air move through this soil at a moderately rapid rate. Water runs off the surface at a slow rate. A seasonal high water table is about 3 to 5 feet below the surface during December through April. This soil is frequently flooded for very brief to brief periods during December through April. The available water capacity is moderate to high. The shrink-swell potential is low.

Included with these soils in mapping are a few small areas of Cahaba, Guyton, Harleston, and Ouachita soils. Cahaba and Harleston soils are at higher elevations on stream terraces or on remnants of stream terraces that appear as islands on the flood plain. These soils have a strongly developed subsoil. The poorly drained Guyton soils are slightly lower on the landscape than the Iuka soil and are grayish throughout the profile. The well drained Ouachita soils are in landscape positions similar to those of the Ochlockonee soil, and they contain less sand and more clay in the underlying material than either the Iuka or Ochlockonee soil. The included soils make up about 15 percent of the map unit.

These Iuka and Ochlockonee soils are used mainly as woodland. Small acreages are used as pastureland or cropland.

The soils in this map unit are moderately well suited to use as woodland. The potential to produce hardwoods and loblolly pine is high. The main concerns in producing and harvesting timber are a moderate equipment use limitation and seedling mortality caused by wetness and flooding. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees. Conventional methods of harvesting timber generally are suitable, but the soil can be compacted if it is wet and heavy equipment is used.

The soils in this map unit are not suited to cultivated crops. The main limitations are the hazard of frequent flooding, wetness, low soil fertility, and the potentially toxic levels of exchangeable aluminum in the root zone. Levees are needed to adequately control flooding. Unless flooding is controlled and drainage is provided, late-planted crops, such as grain sorghum and soybeans, are better suited than other crops. Field ditches and vegetated outlets help to remove excess surface water. Land grading and smoothing also help to remove excess water. Crop residue left on or near the surface and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to maintain fertility and tilth. It is generally not economically efficient to apply large rates of fertilizer and lime to the soils because of the hazard of frequent flooding.

The soils in this map unit are moderately well suited to pasture. The main limitations are the hazard of overflow, wetness, and low natural fertility. The main suitable pasture plants are bahiagrass, common bermudagrass, tall fescue, singletary peas, and vetch. Grazing when the soil is wet can puddle the surface layer of the soils and damage pasture plants. Excessive water on the surface can be removed by a properly designed drainage system. During periods of flooding, cattle can be moved to protected areas or to pastures at higher elevations. Proper grazing, weed control, and fertilizer are needed for maximum quality of forage.

The soils in this map unit are poorly suited to most urban and recreational uses. They are generally not suited to sites for dwellings because of the hazard of flooding. Roads and streets should be located above the expected flood level and designed to offset the limited ability of the soil to support a load. Flooding can be reduced by major flood-control structures.

The Iuka and the Ochlockonee soils have good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

The Iuka and Ochlockonee soils are in capability subclass Vw. The woodland ordination symbol is 9W for the Iuka soil and 4W for the Ochlockonee soil.

Kn=Kirvin fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and well drained. It is on ridgetops on uplands. The areas of this soil are irregular in shape and range from 20 to 250 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. From top to bottom, the layers of the subsoil to a depth of about 50 inches are dark red clay; red clay; red sandy clay; and red, mottled sandy clay loam. The substratum to a depth of about 60 inches is red, mottled sandy clay loam. In places, the subsoil is sandy clay loam or clay loam throughout.

This Kirvin soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Permeability is moderately slow. The available water capacity is moderate. Water runs off the surface at a medium rate. The shrink-swell potential is moderate. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Malbis, Sacul, Sawyer, and Warnock soils. All of these soils are in landscape positions similar to those of the Kirvin soil. Malbis, Sawyer, and Warnock soils have a brownish, loamy subsoil. Sacul soils have gray mottles in the upper part of the subsoil. The included soils make up about 15 percent of the map unit.

This Kirvin soil is used mainly as woodland. In a few areas, it is used as pastureland, homesites, or cropland.

This soil is well suited to use as woodland and has few limitations for growing and harvesting trees. The potential for production of loblolly pine is high.

This soil is moderately well suited to cultivated crops. The main limitations are the erosion hazard, low soil fertility, and potentially toxic levels of exchangeable aluminum in the root zone. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Corn and wheat are the main crops grown. Crop residue left on or near the surface helps to control runoff and maintain tilth and organic matter content. Crops respond well to fertilizer and lime, which improve soil fertility and reduce the high levels of exchangeable aluminum. Conservation tillage, terraces, diversions, and grassed waterways help to control erosion.

This soil is well suited to pasture. It has few major limitations for this use. Low fertility is a minor limitation. Erosion can be a hazard when the soil is tilled and until pasture plants become established. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. Grasses and legumes grow well if adequate fertilizer is provided. Rotational grazing helps to maintain the quality of forage.

This soil is moderately well suited to urban development. The main limitations are moderate shrink-swell potential, moderately slow permeability, and low strength for roads. The hazard of erosion is increased if the soil is left exposed during site development. The design of roads can offset the limited ability of the soil to support a load. The moderately slow permeability is a limitation where this soil is used as septic tank absorption fields. This limitation can be overcome by enlarging the size of the absorption field. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential.

This soil is moderately well suited to recreational uses. Moderately slow permeability and steepness of slope are the main limitations for playgrounds. Erosion can be controlled in intensively used areas by maintaining a good plant cover. The cover can be maintained by applying fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Prescribed burning increases the amount of browse for deer and seed-producing plants for use by quail.

This Kirvin soil is in capability subclass IIIe. The woodland ordination symbol is 8A.

KR=Kirvin fine sandy loam, 5 to 12 percent slopes

This soil is strongly sloping and well drained. It is on side slopes on uplands. The areas of this soil are irregular in shape and range from 40 to 300 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsurface layer to a depth of about 12 inches is brown fine sandy loam. The upper part of the subsoil to a depth of about 30 inches is yellowish red clay and sandy clay. The lower part of the subsoil to a depth of about 60 inches is mottled red, yellowish red, and light gray sandy clay and clay. In places, the soil has slopes of 12 to 15 percent.

This soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Permeability is moderately slow. The available water capacity is moderate. Water runs off the surface at a rapid rate. The shrink-swell potential is moderate. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Malbis, Sacul, Sawyer, and Warnock soils. Malbis, Sawyer, and Warnock soils are mainly on ridgetops and have a brownish subsoil. Sacul soils are on similar parts of the landscape as the Kirvin soil and have gray mottles in the upper part of the subsoil. The included soils make up about 15 percent of the map unit.

This Kirvin soil is used mainly as woodland. In a few areas, it is used as pastureland or homesites.

This soil is well suited to use as woodland and has few limitations for growing and harvesting trees. The potential for production of loblolly pine is high.

This soil is not suited to cultivated crops. It is limited mainly by a severe erosion hazard. Other soil limitations are low fertility and potentially toxic levels of exchangeable aluminum in the root zone. If this soil is adequately protected against erosion, less sloping areas can be cropped to small grains. The hazard of erosion is generally too severe to grow row crops, such as soybeans. The hazard of erosion can be reduced if fall grain or winter pasture grasses are seeded early, conservation tillage is used, and tillage and seeding are done on the contour or across the slope. Also, waterways should be shaped and seeded to perennial grass.

This soil is moderately well suited to pasture. The main limitations are steepness of slope and low natural fertility. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. The hazard of erosion can be reduced if seedbed preparation is done on the contour or across the slope where practical. In places, the use of equipment is limited by short and irregular slopes. Proper grazing, weed control, and fertilizer are needed for maximum quality of forage.

This soil is moderately well suited to urban development. The main limitations are moderately slow permeability, moderate shrink-swell potential, steepness of slope, and low strength for roads. Excavation for roads and buildings increases the hazard of erosion. Preserving the existing plant cover during construction and revegetating disturbed areas around construction sites as soon as possible help to control erosion. Roads can be designed to overcome the limited capacity of the soil to support a load. Self-contained disposal units are better suited than septic tank absorption fields to dispose of sewage properly because of moderately slow permeability and steepness of slope.

This soil is moderately well suited to recreational uses. It is limited mainly by moderately slow permeability and steepness of slope. Cuts and fills should be seeded or mulched. The plant cover can be maintained by applying fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Kirvin soil is in capability subclass VIe. The woodland ordination symbol is 8A.

Le=Libuse silt loam, 1 to 5 percent slopes

This soil is gently sloping and moderately well drained. It is mainly on ridgetops on high terraces. The areas of this soil are irregular in shape and range from about 10 to 500 acres.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The next layer to a depth of about 11 inches is yellowish brown, mottled silt loam. The subsoil to a depth of about 26 inches is yellowish brown, mottled silty clay loam. The next layer to a depth of about 60 inches is a yellowish brown, mottled silt loam fragipan.

This Libuse soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to crops. Water and air move through this soil at a slow rate. Water runs off the surface at a medium rate. A seasonal high water table is perched above the fragipan at a depth of 1.5 to 3 feet below the surface from December to April. The available water capacity is moderate to high. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Frizzell and Guyton soils. Neither of these soils has a fragipan. Frizzell soils are in nearly level areas. Guyton soils are on the flood plains of narrow drainageways and in depressions. The included soils make up about 15 percent of the map unit.

This Libuse soil is used mainly as woodland. Small acreages are used as pastureland, homesites, or for cultivated crops.

This soil is well suited to use as woodland. The potential for production of loblolly pine is high. This soil has few limitations for use and management; however, competition from unwanted understory plants is moderate. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil is moderately well suited to cultivated crops. The main limitations are low fertility, potentially toxic levels of exchangeable aluminum in the root zone, and steepness of slope. Truck crops are the main crops grown. Corn and cotton are also suitable crops. Most crops respond well to fertilizer and lime, which improve the fertility and reduce high levels of exchangeable aluminum in the root zone. Crop residue left on or near the surface helps to conserve moisture and control erosion. All tillage should be on the contour or across the slope.

This soil is well suited to pasture. Low fertility and steepness of slope are the main limitations. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ball clover, crimson clover, and arrowleaf clover. Farming on the contour during seedbed preparation can help to control erosion. Fertilizer and lime are needed for optimum production of forage.

This soil is moderately well suited to urban development. It has moderate to severe limitations for building sites, local roads and streets, and most sanitary facilities. A seasonal high water table is perched above the fragipan and drainage should be provided if buildings are constructed. Preserving the existing plant cover during construction helps to control erosion in the steeper areas. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. Septic tank absorption fields do not function properly during rainy periods because of wetness and slow permeability. Lagoons or self-contained disposal units can be used to dispose of sewage properly. The design of roads can offset the limited ability of the soil to support a load.

This soil is moderately well suited to recreational uses. Wetness and slow permeability are the main limitations. Steepness of slope is a limitation for playgrounds. Drainage can improve this soil for most recreational uses. Erosion can be controlled on playgrounds by maintaining an adequate cover of plants.

This soil has good potential as habitat for woodland and openland wildlife and poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland openland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

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

LF=Libuse silt loam, 5 to 8 percent slopes

This soil is strongly sloping and moderately well drained. It is on side slopes on high terraces. The areas of this soil are irregular in shape and range from about 10 to 500 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The next layer to a depth of about 9 inches is light yellowish brown, mottled silt loam. The subsoil to a depth of about 24 inches is yellowish brown, mottled silt loam. The next part of the subsoil to a depth of about 60 inches is a yellowish brown, mottled silt loam fragipan. In places, the soil has slopes greater than 8 percent.

This Libuse soil has low fertility. It has high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Water runs off the surface at a medium rate. A seasonal high water table is perched above the fragipan at a depth of about 1.5 to 3 feet from December to April. The available water capacity is moderate to high. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Frizzell and Guyton soils. Neither of these soils has a fragipan. Frizzell soils are in small, nearly level areas. Guyton soils are on the narrow flood plains of small drainageways and in depressions. The included soils make up about 15 percent of the map unit.

This Libuse soil is used mainly as woodland. Small acreages are used as pastureland or homesites.

This soil is well suited to use as woodland and has few limitations for producing and harvesting timber. The potential for production of loblolly pine is moderately high. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil is poorly suited to cultivated crops because of the severe hazard of erosion. The main soil limitations are low fertility and potentially toxic levels of exchangeable aluminum in the root zone. Vegetables, such as potatoes, are the main crops grown. Most crops respond well to fertilizer and lime, which improve the fertility and reduce the high levels of exchangeable aluminum. Crop residue left on or near the surface helps to conserve moisture and control erosion. Farming on the contour or across the slope, where practical, helps to control runoff and erosion.

This soil is moderately well suited to pasture. Low fertility and steepness of slope are the main limitations. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ball clover, crimson clover, and arrowleaf clover. Farming on the contour during seedbed preparation can help to control erosion. Fertilizer and lime are needed for optimum production of forage.

This soil is moderately well suited to urban development. A seasonal high water table is perched above the fragipan and drainage should be provided if buildings are constructed. Preserving the existing plant cover during construction helps to control erosion in the steeper areas. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. Septic tank absorption fields do not function properly during rainy periods because of wetness and slow permeability. Also, effluent from absorption fields can surface in downslope areas and create a hazard to health. Self-contained disposal units can be used to dispose of sewage properly. Roads and streets can be designed to overcome the limited ability of the soil to support a load.

This soil is moderately well suited to recreational uses. The main limitations are wetness and slow permeability. Steepness of slope is a limitation for playgrounds. Drainage can improve this soil for most recreational uses. Maintaining an adequate plant cover on playgrounds helps to control erosion.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland and openland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Libuse soil is in capability subclass IVe. The woodland ordination symbol is 8A.

LT=Litro clay, frequently flooded

This soil is nearly level and poorly drained. This soil is in backswamp areas on the flood plain of the Ouachita River. This soil is subject to frequent overflow from the Ouachita River. The areas of this soil are irregular in shape and range from 20 to 2,000 acres. Slopes are dominantly less than 1 percent, but range from 0 to 2 percent. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark gray, mottled clay about 6 inches thick. The subsoil to a depth of about 60 inches is dark gray, mottled clay in the upper part; gray, mottled clay and silty clay in the middle part; and gray, mottled clay in the lower part.

This Litro soil has low fertility. It has high levels of exchangeable aluminum in the root zone. Water runs off the surface at a slow rate. Permeability is very slow. This soil is frequently flooded for brief to long periods during November through July. Floodwaters typically are 5 to 15 feet deep, but they exceed 20 feet in some years. A seasonal high water table fluctuates between the surface and a depth of about 1 foot during November through June. The shrink-swell potential is high. The available water capacity is moderate to high.

Included with this soil in mapping are a few small areas of Groom, Haggerty, and Perry soils. Groom and Haggerty soils are slightly higher on the landscape than the Litro soil and contain less clay in the subsoil. Perry soils are in similar positions and have a reddish and alkaline substratum.

This Litro soil is used almost entirely as woodland.

This soil is moderately well suited to use as woodland, mainly hardwoods. The main management concerns are a restricted use of equipment and the seedling mortality caused by flooding and wetness. Trees should be water-tolerant and planted or harvested during dry periods. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Drainage or special site preparation, such as bedding and harrowing, help to establish seedlings and reduce the seedling mortality rate.

This soil is not suited to cultivated crops because of the hazard of flooding. Wetness, low fertility, and potentially toxic levels of exchangeable aluminum are additional limitations. Flooding can be reduced by major flood-control structures, such as levees and water pumps.

This soil is poorly suited to pasture. It is limited mainly by flooding, wetness, and low fertility. Common bermudagrass is the main suitable pasture plant. It is not practical to apply high rates of fertilizer and lime because of frequent overflow. During periods of flooding, cattle can be moved to pastures at higher elevations.

This soil is poorly suited to urban and recreational uses because of wetness and the hazard of frequent flooding. Generally, it is not suited to homesites. Additional soil limitations are a high shrink-swell potential and low soil strength as it affects local roads and streets.

This soil has good potential as habitat for wetland wildlife and fair potential as habitat for woodland and openland wildlife (fig. 6). Habitat for waterfowl and furbearers can be improved by constructing shallow ponds. Management that enhances the growth of oak and other mast-producing trees can improve the habitat for white-tailed deer and squirrels.

This Litro soil is in capability subclass Vw. The woodland ordination symbol is 3W.

Ma=Mahan fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and well drained. It is on ridgetops on uplands. The areas of this soil are irregular in shape and range from 20 to 250 acres.

Typically, the surface layer is brown fine sandy loam about 4 inches thick. The next layer to a depth of about 12 inches is reddish brown fine sandy loam. From top to bottom, the layers of the subsoil to a depth of about 60 inches are dark red, mottled clay loam; dark red, mottled sandy clay loam; red sandy clay loam; and red sandy loam. Fragments of ironstone are throughout the subsoil. In places, the subsoil is sandy clay loam throughout.

This Mahan soil has medium fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Permeability is moderate. The available water capacity is moderate to high. Water runs off the

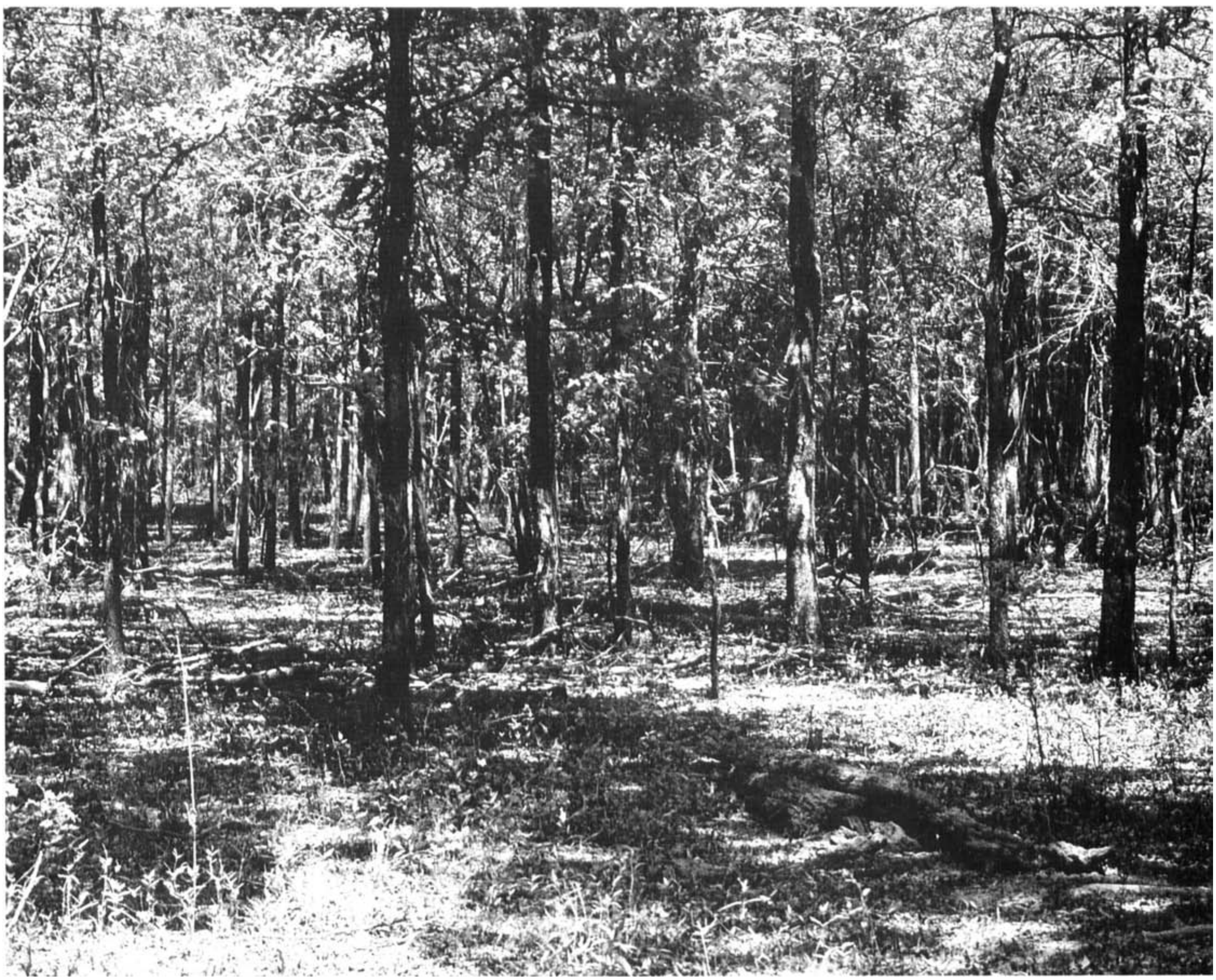

Figure 6.—Bottomland hardwoods in an area of Litro clay, frequently flooded. Areas of this soil provide habitat for woodland and wetland wildlife.

surface at a medium rate. The shrink-swell potential is low. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Bowie, Darley, and Sacul soils. All of these soils are in landscape positions similar to those of the Mahan soil. Darley and Sacul soils are also on side slopes. Bowie soils have a brownish loamy subsoil. Darley soils have more ironstone fragments in the surface, subsurface, and subsoil layers than the Mahan soil. Sacul soils have gray mottles in the upper part of the subsoil. The included soils make up about 15 percent of the map unit.

This Mahan soil is used mainly as woodland. In a few areas, it is used as pastureland or cropland.

This soil is well suited to use as woodland and has few limitations for producing and harvesting trees. The potential for production of loblolly pine is high.

This soil is moderately well suited to cultivated crops. The main limitations are the erosion hazard, medium soil fertility, and potentially toxic levels of exchangeable aluminum in the root zone. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Truck crops are the main crops grown. Cotton and corn are also suitable crops to grow. Crop residue left on or near the surface helps to control runoff and maintain tilth and organic matter content. Crops respond well to fertilizer and lime, which improve soil fertility and reduce the high levels of exchangeable aluminum. Conservation tillage, terraces, diversions, and grassed waterways help to control erosion.

This soil is well suited to pasture and has few limitations for this use. However, erosion is a hazard until pasture grasses become established. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. Grasses and legumes grow well if adequate fertilizer is provided. Rotational grazing helps to maintain the quality of forage.

This soil is moderately well suited to urban development. Moderate permeability and low strength for roads are the main limitations. Seepage is a hazard for sewage lagoons. The design of roads can offset the limited ability of the soil to support a load. Moderate permeability of the subsoil is a limitation where this soil is used as septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption field.

This soil is well suited to recreational uses. Steepness of slope and small stones on the surface are limitations for playgrounds. Erosion can be controlled in intensively used areas by maintaining a good plant cover. The cover can be maintained by applying fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland and openland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Controlled burning in wooded areas can increase the amount of browse palatable to deer and seed-producing plants for use by quail, turkey, and other nongame birds.

This Mahan soil is in capability subclass IIIe. The woodland ordination symbol is 9A.

MH=Mahan fine sandy loam, 5 to 12 percent slopes

This soil is strongly sloping and well drained. It is on side slopes on uplands. The areas of this soil are irregular in shape and range from 40 to 300 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark brown fine sandy loam about 3 inches thick. The next layer to a depth of about 8 inches is yellowish red fine sandy loam. The subsoil to a depth of about 60 inches is red clay in the upper part; red, mottled sandy clay loam and sandy clay in the middle part; and mottled red and strong brown sandy clay in the lower part.

This soil has medium fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Permeability is moderate. The available water capacity is moderate to high. Water runs off the surface at a rapid rate. The shrink-swell potential is low. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Darley and Sacul soils. Darley soils are on the upper side slopes and have ironstone layers in the subsoil. Sacul soils are on the lower side slopes and have gray mottles in the upper part of the subsoil. The included soils make up about 15 percent of the map unit.

This Mahan soil is used mainly as woodland. In a few areas, it is used as pastureland.

This soil is well suited to use as woodland and has few limitations for producing and harvesting trees. The potential for production of loblolly pine is high.

This soil is not suited to cultivated crops. It is limited mainly by a severe erosion hazard. Other soil limitations are medium fertility and potentially toxic levels of exchangeable aluminum in the root zone. If this soil is adequately protected against erosion, less sloping areas can be cropped to small grains. The hazard of erosion is generally too severe to grow row crops, such as soybeans. The hazard of erosion can be reduced if fall grain or winter pasture grasses are seeded early, conservation tillage is used, and tillage and seeding are done on the contour or across the slope. Also, waterways should be shaped and seeded to perennial grass.

This soil is moderately well suited to pasture. The main limitations are steepness of slope and medium natural fertility. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. The hazard of erosion can be reduced if seedbed preparation is done on the contour or across the slope. In places, the use of equipment is limited by short and irregular slopes. Proper grazing, weed control, and fertilizer are needed for maximum quality of forage.

This soil is moderately well suited to urban development. The main limitations are the clayey subsoil layer, steepness of slope, and low strength for roads. Seepage can be a hazard for sewage lagoons. Excavation for roads and buildings increases the hazard of erosion. Preserving the existing plant cover during construction and revegetating disturbed areas around construction sites as soon as possible help to control erosion. Roads can be designed to overcome the limited capacity of the soil to support a load.

This soil is moderately well suited to recreational uses. It is limited mainly by steepness of slope. Cuts and fills should be seeded or mulched to control erosion. The plant cover can be maintained by applying fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Mahan soil is in capability subclass VIe. The woodland ordination symbol is 9A.

Mn=Malbis fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and moderately well drained to well drained. It is on ridgetops on uplands. The areas of this soil are irregular in shape and range from about 20 acres to 500 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 8 inches thick. The subsurface layer to a depth of about 15 inches is light yellowish brown fine sandy loam. The subsoil to a depth of about 60 inches is strong brown sandy clay loam in the upper part and yellowish brown, mottled sandy clay loam in the middle and lower parts.

This Malbis soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through the upper part of the subsoil at a moderate rate and through the lower part at a moderately slow rate. Runoff is medium, and the hazard of water erosion is moderate. A seasonal high water table is about 2.5 to 4 feet below the surface from December to March. The available water capacity is moderate to high. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Ruston and Savannah soils. Ruston soils are on more convex slopes than the Malbis soil, and they have a reddish subsoil. Savannah soils are on high terraces and have a fragipan. The included soils make up about 10 percent of the map unit.

This Malbis soil is used mainly as woodland. Small acreages are used as pastureland or cropland.

This soil is well suited to use as woodland and has few limitations for use and management. The potential to produce pine trees is high (fig. 7).

This soil is moderately well suited to cultivated crops. The main crops are truck crops. Low fertility, a moderate hazard of erosion, and potentially toxic levels of exchangeable aluminum within the root zone are the main limitations. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Crop residue left on or near the surface helps to control runoff and maintain tilth and organic matter content. Farming on the contour also helps to control runoff and erosion. Most crops respond well to fertilizer and lime, which improve fertility and reduce the high levels of exchangeable aluminum.

This soil is well suited to pasture. Low fertility and steepness of slope are the main limitations. Erosion is a hazard until pasture grasses become established. Suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, ball clover, crimson clover, and arrowleaf clover. Rotational grazing helps to maintain the quality of forage. Fertilizer is needed for optimum growth of grasses and legumes. The hazard of erosion can be reduced if seedbed preparation is done on the contour or across the slope.

This soil is moderately well suited to urban development. Wetness and moderately slow permeability are limitations where this soil is used as septic tank absorption fields. Use of sandy backfill for the trench and long absorption lines help to compensate for the moderately slow permeability. There are few limitations for building sites or for local roads and streets. Preserving the existing plant cover during construction helps to control erosion.

This soil is well suited to recreational uses. Steepness of slope is a limitation for playgrounds. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland and openland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Malbis soil is in capability subclass IIIe. The woodland ordination symbol is 9A.

Mr=McLaurin fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and well drained. It is on convex ridgetops on uplands. The areas of this soil are irregular in shape and range from 20 to 150 acres.

Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsurface layer to a depth of about 11 inches is light yellowish brown fine sandy loam. The next layer to a depth of about 17 inches is strong brown fine sandy loam. The subsoil to a depth of about 41 inches is red sandy loam and red, mottled fine sandy loam. The next layer to a depth of about 48 inches is yellowish red and reddish yellow sandy loam. The lower part of the subsoil to a depth of about 60 inches is red sandy clay loam.

This McLaurin soil has low fertility. Water and air move through this soil at a moderate rate. The available water

Figure 7.—Virginia pine trees grow well in areas of Malbis fine sandy loam, 1 to 5 percent slopes. These trees are grown for use as Christmas trees.

capacity is moderate. Water runs off the surface at a medium rate. The shrink-swell potential is low. A seasonal high water table is more than 6 feet below the surface throughout the year.

Included with this soil in mapping are a few small areas of Betis, Briley, and Trep soils. Betis, Briley, and Trep soils are in landscape positions similar to those of the McLaurin soil. Betis soils are sandy throughout the profile. Briley and Trep soils have a sandy surface layer and subsurface layer more than 20 inches thick. The included soils make up about 15 percent of the map unit.

This McLaurin soil is used mainly as woodland. Small acreages are used as cropland or pastureland.

This soil is well suited to use as woodland and has few limitations for producing and harvesting timber. The potential for production of loblolly pine is moderately high.

This soil is well suited to cultivated crops; however, low fertility and moderate available water capacity can limit production. Erosion is a moderate hazard. Suitable crops are corn, cotton, watermelons, sweet potatoes, and wheat. This soil is very friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. In areas where water of suitable quality is available, supplemental irrigation can prevent crop damage during dry periods of most years. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by subsoiling when the soil is dry. The organic matter content can be maintained by using all crop residue, plowing under cover crops, and using a suitable cropping system. The risk of sheet and rill erosion can be reduced by the use of gradient terraces and contour farming. Crops respond well to fertilizer and lime, which improve soil fertility.

This soil is well suited to pasture. Few limitations affect this use. However, soil droughtiness and low fertility can limit production. The main pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and wheat. Proper grazing, weed control, and fertilizer are needed for maximum quality of forage.

This soil is well suited to urban development and has few limitations for this use. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. Unless retainer walls are installed in shallow excavations, cutbanks are subject to slumping. The floor of sewage lagoons should be sealed with impervious material to prevent seepage of effluent and contamination of nearby groundwater supplies.

This soil is well suited to recreational uses; however, a good plant cover in intensively used areas, such as playgrounds, helps to control erosion. The cover can be maintained by adding fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland and openland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Using controlled burning and small irregularly-shaped clear-cuts can increase the amount of browse palatable to deer and seed-producing plants for use by quail and turkeys.

This McLaurin soil is in capability subclass IIe. The woodland ordination symbol is 8A.

Or=Ora fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and moderately well drained. It is on ridgetops on high terraces. The areas of this soil are irregular in shape and range from about 10 to 200 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer to a depth of about 11 inches is brown fine sandy loam. The next layer is yellowish red and dark brown loam to a depth of about 17 inches. The upper part of the subsoil to a depth of about 29 inches is yellowish red clay loam. The lower part of the subsoil, to a depth of about 45 inches is a fragipan of yellowish red sandy clay loam and strong brown sandy loam. The substratum to a depth of about 60 inches is strong brown sandy loam.

This Ora soil has low fertility. It has high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through the upper part of this soil at a moderate rate and through the fragipan at a moderately slow rate. The available water capacity is low to moderate. Water runs off the surface at a medium rate. A seasonal high water table is perched above the fragipan at a depth of about 2 to 3.5 feet from February to April. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Guyton, Libuse, Ruston, and Savannah soils. Guyton soils are in drainageways. They are poorly drained and do not have a fragipan. Libuse and Savannah soils are in landscape positions similar to those of the Ora soil and have a yellowish brown subsoil. The Ruston soils are on uplands and do not have a fragipan. The included soils make up about 15 percent of the map unit.

This Ora soil is used mainly as woodland. Small acreages are used as pastureland or homesites.

This soil is well suited to use as woodland and has few limitations for growing and harvesting trees. The potential for production of loblolly pine is moderately high. However, plant competition can delay natural regeneration but generally does not prevent the eventual development of a fully stocked, normal stand of trees.

Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil is moderately well suited to cultivated crops. The main limitations are low fertility, steepness of slope, high levels of exchangeable aluminum within the root zone, and droughtiness in summer and fall. Truck crops are the main crops grown. Most crops respond well to fertilizer and lime, which improve soil fertility and reduce the levels of exchangeable aluminum in the root zone. Early fall seeding, conservation tillage, terraces, diversions, and grassed waterways help to control erosion.

This soil is well suited to pasture. Erosion is a hazard until pasture grasses become established. Soil droughtiness in summer and fall limits production of forage. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ball clover, crimson clover, and arrowleaf clover. Fertilizer and lime are needed for optimum forage production. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

This soil is moderately well suited to urban development. Wetness, moderate to moderately slow permeability, and low strength for roads and streets are the main limitations. Wetness and moderate to moderately slow permeability are limitations where this soil is used as septic tank absorption fields. Lagoons or self-contained disposal units can be used to dispose of sewage properly. Preserving the existing plant cover during construction helps to control erosion. Subsoil drains placed around foundations can reduce wetness and improve the soil for use as building sites. It is difficult to establish plants in areas where the fragipan has been exposed during earth-moving operations. Mulching and fertilizing disturbed areas help to establish plants.

This soil is moderately well suited to recreational uses. Wetness and moderately slow permeability are the main limitations. Steepness of slope is a limitation for playgrounds. Cuts and fills should be seeded or mulched. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover. Drainage can improve this soil for intensively used areas such as playgrounds.

This soil has good potential as habitat for woodland and openland wildlife and poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland and openland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Ora soil is in capability subclass IIe. The woodland ordination symbol is 8W.

OS=Ora fine sandy loam, 5 to 12 percent slopes

This soil is strongly sloping and moderately well drained. It is on side slopes on high terraces. The areas of this soil are irregular in shape and range from about 10 to 300 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsoil to a depth of about 25 inches is yellowish red sandy clay loam. The subsoil between depths of about 25 inches and 50 inches is a fragipan that is yellowish red, mottled loam in the upper part and strong brown, mottled loam in the lower part. The substratum to a depth of about 60 inches is yellowish red loam.

This Ora soil has low fertility. It has high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through the upper part of this soil at a moderate rate and through the fragipan at a moderately slow rate. The available water capacity is low to moderate. Water runs off the surface at a rapid rate. A seasonal high water table is perched above the fragipan at a depth of about 2 to 3.5 feet from February to April.

Included with this soil in mapping are a few small areas of Guyton, Libuse, Ruston, Savannah, and Smithdale soils. The Guyton soils are in drainageways and do not have a fragipan. Libuse and Savannah soils are in landscape positions similar to those of the Ora soil and have a yellowish brown subsoil. The Ruston soils are on ridgetops on uplands, and the Smithdale soils are on side slopes on uplands. Neither soil has a fragipan.

This Ora soil is used mainly as woodland. Small acreages are used as pastureland or homesites.

This soil is well suited to use as woodland and has few limitations for growing and harvesting trees. The potential for production of loblolly pine is moderately high. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Competing vegetation can be controlled by proper site preparation, spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil is poorly suited to cultivated crops because of the slope and the severe hazard of erosion. Other limitations are low fertility, high levels of exchangeable aluminum within the root zone, and soil droughtiness in the summer. If special practices are used to control erosion, small areas of less sloping soils can be used to grow crops. Most crops respond well to fertilizer and lime, which improve fertility and reduce the high levels of exchangeable aluminum. Limiting tillage for seedbed preparation helps to control runoff and erosion. Erosion on the steeper slopes can be reduced by constructing terraces and grassed waterways, and then farming on the contour.

This soil is moderately well suited to pasture. The main limitations are steepness of slope, soil droughtiness, and low fertility. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ball clover, crimson clover, and arrowleaf clover. Fertilizer and lime are needed for optimum forage production. The hazard of erosion can be reduced if seedbed preparation is done on the contour or across the slope.

This soil is moderately well suited to urban development. The main limitations are wetness, steepness of slope, moderate to moderately slow permeability, and low strength for roads and streets. Preserving the existing plant cover during construction and revegetating disturbed areas as soon as possible reduce erosion. Where deep cuts have exposed the fragipan, it is difficult to establish plants. Mulching and fertilizing help to establish plants in these areas. Wetness and moderate to moderately slow permeability are limitations where this soil is used as septic tank absorption fields. Self-contained disposal units can be used to dispose of sewage properly. Effluent from absorption fields can surface in downslope areas and create a hazard to health. A seasonal high water table is perched above the fragipan and drainage should be provided if buildings are constructed.

This Ora soil is moderately well suited to recreational uses. It is limited mainly by steepness of slope, wetness, and moderate to moderately slow permeability. Cuts and fills should be seeded or mulched. Erosion and sedimentation can be reduced and the beauty of the area enhanced by maintaining an adequate plant cover.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing woodland and openland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Seeding small openings to grasses, clovers, and other plants provides food and cover for deer, rabbits, turkeys, and broad openings for quail and turkeys.

This Ora soil is in capability subclass IVe. The woodland ordination symbol is 8W.

PF=Perry clay, frequently flooded

This soil is level and poorly drained. It is in backswamp areas on flood plains of the Ouachita River. The areas of this soil are irregular in shape and range from about 20 to 400 acres. Slopes are dominantly less than 1 percent. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark gray, mottled clay about 4 inches thick. The subsoil to a depth of about 18 inches is gray, mottled clay. The next part of the subsoil to a depth of about 30 inches is dark reddish brown clay. The substratum to a depth of about 70 inches is mottled gray and reddish brown clay in the upper part and dark reddish brown, mottled clay in the lower part.

This Perry soil has medium fertility. It has moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a very slow rate. Water runs off the surface at a very slow rate. This soil is subject to brief to very long periods of flooding, mainly from December to June. A seasonal high water table fluctuates between the surface and a depth of about 2 feet below the surface during December through June. This soil has a very high shrink-swell potential. The available water capacity is high.

Included with this soil in mapping are a few small areas of Litro and Portland soils in landscape positions similar to those of the Perry soil. Litro soils are grayish throughout the profile. Portland soils have a subsoil that is reddish brown throughout the profile. These included soils make up about 15 percent of the map unit.

This Perry soil is used mainly as woodland. A small acreage is used as pastureland.

This Perry soil is moderately well suited to use as woodland, mainly hardwoods. The main concerns in producing and harvesting timber are a severe equipment use limitation and the seedling mortality caused by flooding, wetness, and the clayey surface layer. Also, plant competition is moderate. Competing vegetation can be controlled by proper site preparation, spraying, cutting or girdling to eliminate unwanted weeds, brush, or trees. Only trees that can tolerate seasonal wetness should be planted. Because the clayey soil is sticky when wet, most planting and harvesting equipment can be used only during dry periods. Special site preparation, such as harrowing and bedding, can reduce the seedling mortality rate.

This soil is not suited to cultivated crops because of wetness and the hazard of frequent flooding. In some years, late-planted crops, such as soybeans and grain sorghum, can be grown. This soil is sticky when wet and hard when dry, and it becomes cloddy if tilled when it is too wet or too dry. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps. Conservation tillage and crop residue left on or near the surface help to improve tilth and soil fertility.

This soil is poorly suited to pasture because of wetness and the hazard of frequent flooding. Flooding and wetness limit the choice of plants and the grazing period. The main suitable pasture plants are common bermudagrass, winter peas, vetch, and adapted native grasses. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. During periods of flooding, cattle can be moved to adjacent protected areas or to pastures at higher elevations.

This soil is poorly suited to urban and recreational uses. The main limitations are wetness, very high shrink-swell potential, clayey texture, very slow permeability, low strength for roads and streets, and the hazard of flooding. Major flood-control structures, along with extensive local drainage systems are needed to protect this soil from flooding. Roads can be raised above the expected flood elevation.

This soil has fair potential as habitat for woodland and wetland wildlife and poor potential as habitat for openland wildlife. Woodland wildlife habitat is easily improved and maintained. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Perry soil is in capability subclass Vw. The woodland ordination symbol is 2W.

Po=Portland silty clay loam, occasionally flooded

This soil is level and somewhat poorly drained. It is on broad flats on the flood plains of the Ouachita River and other former channels of the Arkansas River. The areas of this soil are irregular in shape and range from about 50 to 500 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark grayish brown, mottled silty clay loam about 6 inches thick. The next layer to a depth of about 13 inches is dark grayish brown, mottled silty clay. The subsoil to a depth of about 50 inches is reddish brown, mottled clay in the upper and middle parts and reddish brown clay in the lower part. The substratum to a depth of about 60 inches is gray, mottled clay. In places, the surface layer is silt loam.

This Portland soil has medium fertility. It has moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow rate. A seasonal high water table is about 1 to 2 feet below the surface during December through May. This soil is occasionally flooded for very brief to long periods during December through May. Floodwaters are 5 feet or more deep. The surface layer of this soil is sticky when wet and hard when dry. The shrink-swell potential is high. The available water capacity is moderate to high.

Included with this soil in mapping are a few small areas of Hebert and Perry soils. Hebert soils are higher on the landscape than the Portland soil and are loamy throughout the profile. Perry soils are in similar positions and have a subsoil that is gray in the upper part. The included soils make up about 15 percent of the map unit.

This Portland soil is used mainly as woodland. Small acreages are used as pastureland or for cultivated crops.

This soil is moderately well suited to use as woodland, mainly to grow hardwoods. The main concerns in producing and harvesting timber are a restricted use of equipment, seedling mortality, and plant competition caused by occasional flooding and wetness. Trees should be water-tolerant and planted or harvested during dry periods. Special site preparation, such as harrowing and bedding, can improve seedling survival. Competing vegetation can be controlled by proper site preparation. Cutting or girdling eliminates unwanted weeds, brush, or trees.

This soil is poorly suited to cultivated crops. The main limitations are the hazard of flooding, wetness, potentially toxic levels of exchangeable aluminum in the root zone, and poor tilth. Suitable crops are soybeans and grain sorghum. This soil is sticky when wet and hard when dry, and it becomes cloddy if tilled when it is too wet or too dry. A drainage system is needed for most cultivated crops. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps.

This soil is moderately well suited to pasture. Wetness is the main limitation, and flooding is a hazard. Suitable pasture plants are common bermudagrass and adapted native grasses. During periods of flooding, cattle can be moved to adjacent protected areas or to pastures at higher elevations. It is not practical to apply high rates of fertilizer and lime because of the hazard of flooding. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is poorly suited to urban and recreational uses. It is generally not suited to dwellings because of the hazard of flooding. The main limitations are wetness, very slow permeability, low strength for roads and streets, and very high shrink-swell potential. Protection from flooding and an extensive drainage system are needed where this soil is used for building sites and sanitary facilities. Roads can be raised above the expected flood level.

This soil has fair potential as habitat for openland wildlife and good potential as habitat for woodland and wetland wildlife. Habitat for waterfowl and furbearers can be improved by constructing shallow ponds. Habitat for white-tailed deer and squirrels can be improved by encouraging the growth of oak trees and desirable understory plants. Habitat for openland wildlife species, such as doves, quail, and rabbits, can be improved by providing undisturbed vegetated areas near the edges of cropland.

This Portland soil is in capability subclass IVw. The woodland ordination symbol is 6W.

PR=Portland clay, frequently flooded

This soil is level and somewhat poorly drained. It is on broad flats on the flood plains of the Ouachita River and other former channels of the Arkansas River. The areas of this soil are irregular in shape and range from about 50 to 500 acres. Slopes are dominantly less than 1 percent. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is grayish brown, mottled clay about 4 inches thick. The next layer is grayish brown, mottled clay to a depth of 10 inches. The subsoil to a depth of about 48 inches is reddish brown, mottled clay. The substratum to a depth of about 60 inches is mottled gray, reddish brown, and strong brown silty clay. In places, the surface layer is silt loam.

Included with this soil in mapping are a few small areas of Hebert and Perry soils. Hebert soils are higher on the landscape than the Portland soil and are loamy throughout the profile. Perry soils are in similar positions and have a subsoil that is gray in the upper part. The included soils make up about 15 percent of the map unit.

This Portland soil has medium fertility. It has moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow rate. A seasonal high water table is 1 to 2 feet below the surface during December through May. This soil is frequently flooded for very brief to long periods. Floodwaters are 5 feet or more deep. The surface layer of this soil is sticky when wet and hard when dry. The shrink-swell potential is high. The available water capacity is moderate to high.

This Portland soil is used mainly as woodland. A small acreage is used as pastureland.

This soil is moderately well suited to use as woodland, mainly hardwoods. The main concerns in producing and harvesting timber are a restricted use of equipment and the seedling mortality caused by flooding, wetness, and the clay surface layer. Trees should be water-tolerant and planted or harvested during dry periods. Plant competition can delay natural regeneration but does not prevent the eventual establishment of a fully stocked, normal stand of trees. Proper site preparation controls initial plant competition and cutting or girdling controls subsequent growth. Unless flooding is reduced, seedling mortality is high. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps.

This soil is not suited to cultivated crops because of the hazard of frequent flooding. The main limitations are wetness, poor tilth, and potentially toxic levels of exchangeable aluminum in the root zone. The main suitable crops are soybeans and grain sorghum. This soil is sticky when wet and hard when dry, and it becomes cloddy if tilled when it is too wet or too dry. A drainage system is needed for most cultivated crops. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps.

This soil is poorly suited to pasture, mainly because of the hazard of frequent flooding. The main limitations are wetness and poor tilth. Suitable pasture plants are common bermudagrass and adapted native grasses. During periods of flooding, cattle can be move to adjacent protected areas or to pastures at higher elevations. It is not practical to apply high rates of fertilizer and lime because of the hazard of flooding. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is poorly suited to urban and recreational uses, mainly because of wetness and the hazard of flooding. Other soil limitations are the high shrink-swell potential, very slow permeability, and low strength for roads and streets. Protection from flooding and an extensive drainage system are needed where this soil is used for building sites and sanitary facilities. Roads can be raised above the expected flood level.

This soil has good potential as habitat for woodland and wetland wildlife and fair potential as habitat for openland wildlife. Habitat for waterfowl and furbearers can be improved by constructing shallow ponds. Habitat for white-tailed deer and squirrels can be improved by encouraging the growth of oak trees and desirable understory plants. Habitat for openland wildlife species, such as doves, quail, and rabbits, can be improved by providing undisturbed vegetated areas near the edges of cropland.

This Portland soil is in capability subclass Vw. The woodland ordination symbol is 6W.

Rs=Ruston fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and well drained. It is on ridgetops on uplands. The areas of this soil are long and narrow and range from about 10 acres to 350 acres.

Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam about 12 inches thick. The subsoil extends to a depth of about 92 inches. From top to bottom, the layers of the subsoil are yellowish red sandy clay loam; yellowish red fine sandy loam; yellowish red and light yellowish brown fine sandy loam; mottled yellowish red, yellowish brown, red, and light gray sandy clay loam; and mottled red, yellowish brown, and strong brown fine sandy loam.

This Ruston soil has low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderate rate. Runoff is medium. This soil dries quickly after rains. The available water capacity is moderate to high. A seasonal high water table is more than 6 feet below the surface throughout the year. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Malbis and Smithdale soils. Malbis soils have less convex slopes than the Ruston soil. They are brownish throughout the profile and have plinthite nodules in the subsoil. Smithdale soils are on side slopes. They do not have a bisequum in the profile.

This Ruston soil is used mainly as woodland. Small acreages are used as pastureland, cropland, or homesites.

This soil is well suited to use as woodland and has few limitations for use and management. The potential for production of loblolly pine is high (fig. 8).

This soil is moderately well suited to cultivated crops. The main crops are sweet potatoes, watermelons, soybeans, corn, and cotton. Low fertility, steepness of slope, and potentially toxic levels of exchangeable aluminum within the root zone are the main limitations. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Conservation tillage, terraces, and grassed waterways also help to control erosion. Most crops respond well to fertilizer and lime, which improve fertility and reduce the moderately high levels of exchangeable aluminum.

This soil is well suited to pasture. Low fertility is a limitation and erosion is a hazard when pasture plants are being established. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ball clover, and crimson clover. Fertilizer and lime are needed for optimum growth of grasses and legumes. Seedbeds can be prepared on the contour or across the slope, where it is practical, to help control erosion. Rotational grazing helps to maintain the quality of forage.

This soil is moderately well suited to urban development. Moderate permeability is a limitation where this soil is used as septic tank absorption fields, but this limitation can be overcome by increasing the size of the absorption field. Low strength is a limitation for roads and streets. This limitation can be overcome by strengthening the road base.

This soil is well suited to recreational uses. It has few limitations for this use; however, steepness of slope and small stones on the surface are limitations for playgrounds. Erosion can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Ruston soil is in capability subclass IIIe. The woodland ordination symbol is 8A.

Sa=Sacul very fine sandy loam, 1 to 5 percent slopes

This soil is moderately well drained and gently sloping. It is on convex ridgetops on uplands. The areas of this soil are irregular in shape and range from 20 to 500 acres.

Typically, the surface layer is dark brown very fine sandy loam about 3 inches thick. The subsurface layer to a depth of about 8 inches is light yellowish brown, mottled very fine sandy loam. From top to bottom, the layers of the subsoil to a depth of about 65 inches are red clay; red, mottled clay; mottled grayish brown and red clay; pale brown, mottled clay; and light brownish gray, mottled silty clay loam.

This soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a slow rate. Water runs off the surface at a medium rate. A seasonal high water table is 2 to 4 feet below the surface from December to April. The available water capacity is moderate to high. The shrink-swell potential is high.

Included with this soil in mapping are a few small areas of Darley and Mahan soils. Darley and Mahan soils are in landscape positions similar to those of the Sacul soil. Darley soils have layers of ironstone in the subsoil. Mahan soils do not have gray mottles in the upper part of the subsoil. The included soils make up about 15 percent of the map unit.

Figure 8.—Loblolly pine trees grow well in areas of Ruston fine sandy loam, 1 to 5 percent slopes.

This Sacul soil is used mainly as woodland. Small acreages are used as pastureland or homesites.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is moderately high. The main concerns are the hazard of soil compaction and a moderate limitation to the use of equipment caused by wetness. Also, plant competition is moderate. Rutting and soil compaction can be minimized by logging during the drier seasons. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil is poorly suited to cultivated crops. The main limitations are steepness of slope, low fertility, and moderately high levels of exchangeable aluminum in the root zone. Because of the severe hazard of erosion, this soil is better suited to close-sown crops, such as small grains, than to row crops. Managing crop residue, stripcropping, farming on the contour, and terracing reduce soil loss by erosion. Most crops respond well to fertilizer and lime, which improve fertility and reduce the levels of exchangeable aluminum.

This soil is well suited to pasture. Low fertility is the main soil limitation. Erosion is a hazard until pasture grasses become established. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. Fertilizer and lime are needed for optimum production of forage.

This soil is poorly suited to urban development. The main limitations are the clayey subsoil, wetness, slow permeability, the high shrink-swell potential, and low strength for roads. Slow permeability and wetness are severe limitations where this soil is used as septic tank absorption fields. Lagoons or self-contained disposal units can be used to dispose of sewage properly. Buildings and roads can be designed to withstand the effects of shrinking and swelling of the soil and the limited ability of the soil to support a load.

This soil is moderately well suited to recreational uses. Steepness of slope and small stones on the surface are limitations for playgrounds. Slow permeability and wetness are additional soil limitations for most recreational uses. Maintaining a vegetative cover on the soil can help to control runoff and control erosion. Excess surface water can be removed by using shallow ditches and providing the proper grade.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Sacul soil is in capability subclass IVe. The woodland ordination symbol is 8C.

SB=Sacul very fine sandy loam, 5 to 12 percent slopes

This soil is strongly sloping and moderately well drained. It is on side slopes on uplands. The areas of this soil are irregular in shape and range from 40 to 350 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark grayish brown very fine sandy loam about 4 inches thick. The subsurface layer to a depth of about 10 inches is pale brown fine sandy loam. The subsoil to a depth of about 60 inches is red, mottled clay in the upper part; light brownish gray, mottled sandy clay in the middle part; and light brownish gray, mottled silty clay loam in the lower part.

This soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Permeability is slow. The available water capacity is moderate to high. Water runs off the surface at a rapid rate. A seasonal high water table is 2 to 4 feet below the surface from December to April. The shrink-swell potential is high.

Included with this soil in mapping are a few small areas of Darley and Mahan soils. Darley and Mahan soils are in similar positions on the landscape as the Sacul soil. Darley soils have ironstone layers in the subsoil. Mahan soils do not have gray mottles in the upper part of the subsoil. The included soils make up about 15 percent of the map unit.

This Sacul soil is used mainly as woodland. In a few areas, it is used as pastureland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is moderately high. The main concerns in producing and harvesting timber are the risk of soil compaction and a restricted use of equipment caused by wetness. Conventional methods of harvesting timber generally can be used; however, logging should be done during the drier periods to prevent rutting and reduce soil compaction. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil is not suited to cultivated crops. The hazard of erosion is too severe for this use. However, if special conservation practices are used, less sloping areas can be used to grow close-sown crops, such as small grains.

This soil is moderately well suited to pasture. The main limitations are the erosion hazard and low natural fertility.

Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. Native grasses are best suited to the more sloping areas where seedbed preparation is difficult. Proper grazing, weed control, and fertilizer are needed for maximum quality of forage.

This soil is poorly suited to urban development. The main limitations are slow permeability, steepness of slope, the clayey subsoil, wetness, high shrink-swell potential, and low strength for roads. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. Establishing and maintaining the plant cover can be achieved through proper fertilizing, seeding, mulching, and shaping of the slopes. Wetness and slow permeability limit the performance of septic tank absorption fields. Lagoons or self-contained disposal units can be used to dispose of sewage properly. Buildings and roads can be designed to offset the effects of shrinking and swelling and the limited ability of the soil to support a load.

This soil is moderately well suited to recreational uses. It is limited mainly by wetness, slow permeability, and the steepness of slope. Cuts and fills should be seeded or mulched to control erosion. The plant cover can be maintained by applying fertilizer and by controlling traffic.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Sacul soil is in capability subclass VIe. The woodland ordination symbol is 8C.

Sg=Savannah fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and moderately well drained. It is on ridgetops and side slopes on high terraces. The areas of this soil are irregular in shape and range from about 10 to 200 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The next layer to a depth of about 8 inches is brown fine sandy loam. The subsurface layer to a depth of about 13 inches is pale brown, mottled fine sandy loam. The subsoil to a depth of about 26 inches is yellowish brown loam. Below this to a depth of about 60 inches the subsoil is a fragipan of yellowish brown loam and sandy clay loam.

This Savannah soil has low fertility. It has moderately high to high levels of exchangeable aluminum in the root zone. Water and air move through the upper part of this soil at a moderate rate and through the lower part at a moderately slow rate. The available water capacity is low to moderate. Water runs off the surface at a medium rate. A seasonal high water table is perched above the fragipan at a depth of 1.5 to 3 feet from January to March. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Guyton, Libuse, Ora, and Ruston soils. Guyton soils are on flood plains of small drainageways. They are poorly drained and are grayish throughout the profile. Libuse and Ora soils are in landscape positions similar to those of the Savannah soil. Libuse soils have more silt and less sand in the subsoil than the Savannah soil. Ora soils have a subsoil that is mainly yellowish red. Ruston soils are on uplands and do not have a fragipan. The included soils make up about 15 percent of the map unit.

This Savannah soil is used mainly as woodland. Small acreages are used as pastureland or homesites.

This soil is moderately well suited to use as woodland. The potential to produce pine trees is moderately high. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees. Planting and harvesting can be done only during the drier periods to reduce rutting and soil compaction.

This soil is moderately well suited to cultivated crops. The main limitations are low fertility, steepness of slope, moderately high to high levels of exchangeable aluminum in the root zone, and droughtiness in the summer. Truck crops are the main crops grown. Most crops respond well to fertilizer and lime, which improve soil fertility and reduce the levels of exchangeable aluminum in the root zone. Conservation tillage, terraces, diversions, and grassed waterways help to reduce erosion. Conservation tillage and terraces also help to conserve moisture.

This soil is well suited to pasture. Low fertility and soil droughtiness are the main limitations. Erosion is a hazard until pasture grasses become established. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ball clover, crimson clover, and arrowleaf clover. Fertilizer and lime are needed for optimum forage production. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is moderately well suited to urban development. Wetness, moderate to moderately slow permeability, steepness of slope, and low strength for roads are the main limitations. Moderate to moderately slow permeability and wetness increase the possibility for septic tank absorption fields to fail. Lagoons or self-contained disposal units can be used to dispose of sewage properly. Preserving the existing plant cover during construction helps to control erosion. Homesite development should be done in a way that preserves as many trees as possible. It is difficult to establish plants in areas where the fragipan has been exposed during earth-moving operations. Mulching and fertilizing cut areas help to establish plants. The water table can be reduced by installing an adequate drainage system. Roads can be designed to overcome the limited ability of the soil to support a load.

This soil is moderately well suited to recreational uses. Wetness and moderate to moderately slow permeability are the main limitations. Steepness of slope is also a limitation for playgrounds. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover. Drainage can improve this soil for intensively-used areas such as playgrounds.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. Also, there are few soil limitations to developing openland and woodland wildlife habitat. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Savannah soil is in capability subclass IIe. The woodland ordination symbol is 8W.

SH=Savannah fine sandy loam, 5 to 12 percent slopes

This soil is strongly sloping and moderately well drained. It is on side slopes on high terraces. The areas of this soil are irregular in shape and range from about 10 to 200 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The next layer to a depth of about 11 inches is pale brown fine sandy loam. The upper part of the subsoil to a depth of about 28 inches is strong brown, mottled loam and sandy clay loam. The lower part of the subsoil to a depth of about 60 inches is a fragipan of yellowish brown, mottled sandy clay loam.

This Savannah soil has low fertility. It has moderately high to high levels of exchangeable aluminum in the root zone that are potentially toxic to crops. Water and air move through the upper part of this soil at a moderate rate and through the lower part at a moderately slow rate. The available water capacity is low to moderate. Water runs off the surface at a medium rate. A seasonal high water table is perched above the fragipan at a depth of 1.5 to 3 feet from January to March. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Guyton, Libuse, Ora, and Ruston soils. Guyton soils are on flood plains of small drainageways. They are poorly drained and are grayish throughout the profile. Libuse and Ora soils are in landscape positions similar to those of the Savannah soil. Libuse soils have more silt and less sand in the upper part of the subsoil than the Savannah soil. Ora soils have a yellowish red subsoil. Ruston soils are on ridgetops on uplands and do not have a fragipan. The included soils make up about 15 percent of the map unit.

This Savannah soil is used mainly as woodland. Small acreages are used as pastureland or homesites.

This soil is moderately well suited to use as woodland. The potential to produce pine trees is moderately high. Wetness in winter and spring can restrict the use of equipment. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil is poorly suited to cultivated crops. The main limitations are low fertility, steepness of slope, moderately high to high levels of exchangeable aluminum in the root zone, and soil droughtiness in summer and fall. Erosion is a severe hazard. Most crops respond well to fertilizer and lime, which help improve soil fertility and reduce the levels of exchangeable aluminum in the root zone. Early fall seeding, conservation tillage, terraces, diversions, and grassed waterways help to control erosion. Conservation tillage and terraces also help to conserve moisture.

This soil is moderately well suited to pasture. Low soil fertility and droughtiness in summer and fall are the main limitations. Erosion can be a hazard when the soil is tilled and until pasture plants become established. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, ball clover, crimson clover, and arrowleaf clover. Fertilizer and lime are needed for optimum forage production. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is moderately well suited to urban development. Steepness of slope, wetness, moderate to moderately slow permeability, and low strength for roads and streets are the main limitations. Wetness and moderate to moderately slow permeability are limitations where this soil is used as septic tank absorption fields. Self-contained disposal units can be used to dispose of sewage properly. Preserving the existing plant cover during construction helps to control erosion. Homesite development should be done in a way that preserves as many trees as possible. It is difficult to establish plants in areas where the fragipan has been exposed during earth-moving operations. Mulching and fertilizing cut areas help to establish plants.

This soil is moderately well suited to recreational uses. Wetness, steepness of slope, and moderate to moderately slow permeability are the main limitations. Cuts and fills should be seeded or mulched. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover. Drainage can improve this soil for intensively-used areas such as playgrounds.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat can be improved by controlled burning or by providing small, irregularly-shaped clear-cuts. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This Savannah soil is in capability subclass IVe. The woodland ordination symbol is 8W.

Sk=Sawyer silt loam, 1 to 5 percent slopes

This soil is gently sloping and moderately well drained. It is on broad ridgetops on uplands. The areas of this soil are irregular in shape and range from 20 to 300 acres.

Typically, this Sawyer soil has a brown silt loam surface layer about 9 inches thick. The subsoil to a depth of about 22 inches is strong brown, mottled loam. To a depth of about 35 inches, it is yellowish brown, mottled silty clay loam. The lower part of the subsoil to a depth of about 60 inches is gray and light brownish gray, mottled silty clay.

This soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through the upper part of this soil at a moderately slow rate and through the lower part at a slow rate. Water runs off the surface at a medium rate. A seasonal high water table is 2 to 3 feet below the surface from December to April. The shrink-swell potential is moderate in the upper part of the subsoil and high in the lower part. The available water capacity is moderate to high.

Included with this soil in mapping are a few small areas of Malbis, Sacul, and Savannah soils. Malbis and Sacul soils are in landscape positions similar to those of the Sawyer soil. Malbis and Savannah soils are loamy throughout the profile. Also, Savannah soils have a fragipan. Sacul soils have a subsoil that is clayey in the upper part and loamy in the lower part. The included soils make up about 10 percent of the map unit.

This Sawyer soil is used mainly as woodland. Small acreages are used as pastureland or cropland.

This soil is well suited to the production of loblolly pine. The main concern in producing and harvesting timber is competition from unwanted understory plants. To prevent rutting and soil compaction, mechanical site preparation and harvesting activities can be scheduled for the drier periods. Proper site preparation controls initial growth of understory plants, and spraying, cutting, and girdling control subsequent growth.

This soil is moderately well suited to cultivated crops. The main crops grown are cotton and corn. This soil is limited mainly by wetness, low fertility, and the hazard of erosion. Also, potentially toxic levels of exchangeable aluminum are in the root zone. Proper row arrangement, field ditches, and suitable outlets can remove excess surface water. Conservation tillage, terraces, diversions, and grassed waterways help to control erosion. Crop residue left on or near the surface helps to maintain tilth and organic matter content. Crops respond well to fertilizer and lime, which improve soil fertility and reduce the high levels of exchangeable aluminum.

This Sawyer soil is well suited to pasture; however, erosion can be a hazard when the soil is tilled and until pasture plants become established. The main suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, tall fescue, ball clover, crimson clover, and arrowleaf clover. Grazing when the soil is wet compacts the surface layer and damages the pasture plants. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is moderately well suited to urban development. Limitations to this use include wetness, moderately slow to slow permeability, the clayey subsoil, steepness of slope, high shrink-swell potential, and low strength for roads. Excess water can be removed by using shallow ditches and providing the proper grade. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. A seasonal high water table and moderately slow to slow permeability increase the possibility for septic tank absorption fields to fail. Lagoons or self-contained disposal units can be used to dispose of sewage properly. Buildings and roads can be designed to offset the effects of shrinking and swelling and to compensate for the limited ability of the soil to support a load.

This soil is moderately well suited to most intensive recreational uses. It is limited mainly by wetness and moderately slow to slow permeability. Steepness of slope is a limitation for playgrounds. Drainage can improve this soil for intensively-used areas, such as playgrounds and camp areas. The hazard of erosion can be reduced on playgrounds if adequate plant cover is maintained.

This soil has good potential as habitat for woodland and openland wildlife and poor potential as habitat for wetland wildlife. Woodland wildlife habitat can be improved by preserving oak and other large mast-producing trees and by using controlled burning to encourage the growth of understory plants. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Where the forest borders cropland or pastureland, field borders planted with shrubs or annual game-food mixtures will provide food and cover for wildlife.

This Sawyer soil is in capability subclass IIIe. The woodland ordination symbol is 8W.

SL=Sawyer silt loam, 5 to 8 percent slopes

This soil is moderately sloping and moderately well drained. It is on side slopes on uplands. The areas of this soil are irregular in shape and range from 20 to 300 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. From top to bottom, the layers of the subsoil to a depth of about 60 inches are strong brown, mottled silty clay loam; yellowish brown, mottled silty clay; yellowish brown, mottled silty clay loam; and gray, mottled clay.

This soil has low fertility and high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through the upper part of this soil at a moderately slow rate and through the lower part at a slow rate. Water runs off the surface at a rapid rate. A seasonal high water table is 2 to 3 feet below the surface from December to April. The shrink-swell potential is moderate in the upper part of the subsoil and high in the lower part. The available water capacity is moderate to high.

Included with this soil in mapping are a few small areas of Malbis, Sacul, and Savannah soils. Malbis and Sacul soils are in landscape positions similar to those of the Sawyer soil. Savannah soils are on high terraces. Malbis soils are loamy throughout the profile. Sacul soils have a subsoil that is clayey in the upper part and loamy in the lower part. Savannah soils have a fragipan. The included soils make up about 10 percent of the map unit.

This Sawyer soil is used mainly as woodland or pastureland. A small acreage is used as cropland.

This soil is well suited to the production of loblolly pine. The main concern in producing and harvesting timber is competition from unwanted understory plants. To prevent rutting and soil compaction, mechanical site preparation and harvesting activities can be scheduled for the drier periods. Proper site preparation controls initial growth of understory plants, and spraying, cutting, and girdling control subsequent growth.

This soil is moderately well suited to cultivated crops. The main crops grown are cotton and corn. The main limitations are low fertility, wetness, and the hazard of erosion. Also, potentially toxic levels of exchangeable aluminum are in the root zone. Proper row arrangement, field ditches, and suitable outlets can remove excess surface water. Conservation tillage, terraces, diversions, and grassed waterways help to control erosion. Crop residue left on or near the surface helps to maintain tilth and organic matter content. Crops respond well to fertilizer and lime, which improve soil fertility and reduce the high levels of exchangeable aluminum.

This Sawyer soil is well suited to pasture; however, erosion is a hazard until pasture grasses become established. Low fertility is also a limitation. The main suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, tall fescue, ball clover, crimson clover, and arrowleaf clover. Grazing when the soil is wet compacts the surface layer and damages the pasture plants. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is moderately well suited to urban development. Limitations to this use include wetness, moderately slow to slow permeability, the clayey subsoil, steepness of slope, high shrink-swell potential, and low strength for roads and streets. Excess water can be removed by using shallow ditches and providing the proper grade. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. Wetness and moderately slow to slow permeability are limitations where this soil is used as septic tank absorption fields. Self-contained disposal units can be used to dispose of sewage properly. Buildings and roads can be designed to offset the effects of shrinking and swelling and to compensate for the limited ability of the soil to support a load.

This soil is moderately well suited to most intensive recreational uses. It is limited mainly by wetness and moderately slow to slow permeability. Steepness of slope is a limitation for playgrounds. Drainage can improve this soil for intensively-used areas, such as playgrounds and camp areas. A good plant cover on playgrounds helps to control erosion.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is improved where oak and other large mast-producing trees are preserved. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Controlled burning increases the amount of browse palatable to deer and seed-producing plants for use by quail and turkey.

This Sawyer soil is in capability subclass IIIe. The woodland ordination symbol is 8W.

SM=Smithdale fine sandy loam, 8 to 15 percent slopes

This soil is strongly sloping and well drained. It is on side slopes on uplands. The areas of this soil are irregular in shape and range from about 10 to 150 acres. Fewer observations were made than in most other map units. The detail in mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is dark grayish brown fine sandy loam about 8 inches thick. The subsurface layer to a depth of about 16 inches is pale brown fine sandy loam. The next layer to a depth of about 24 inches is brown sandy loam. The subsoil to a depth of about 40 inches is red and yellowish red sandy clay loam. The lower part of the subsoil to a depth of about 60 inches is yellowish red sandy loam.

This soil has low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through this soil at a moderate rate. Water runs off the surface at a rapid rate. The available water capacity is moderate to high. A seasonal high water table is more than 6 feet below the surface throughout the year. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of McLaurin and Ruston soils. McLaurin and Ruston soils are on ridgetops. McLaurin soils contain less clay in the subsoil than the Smithdale soil. Ruston soils have a bisequum in the profile. The included soils make up about 15 percent of the map unit.

This Smithdale soil is used mainly as pastureland or woodland. Small acreages are used as homesites.

This soil is well suited to use as woodland and has few limitations for use and management. The potential for production of loblolly pine is moderately high.

This soil is not suited to crops. The hazard of erosion is too severe for this use. However, if special conservation practices are used, less sloping areas can be used to grow close-sown crops, such as small grain. The main soil limitations are low fertility and moderately high levels of exchangeable aluminum in the root zone. The hazard of erosion can be reduced if fall grain or winter pasture grasses are seeded early, conservation tillage is used, and tillage and seeding are on the contour or across the slope. Also, waterways should be shaped and seeded to perennial grasses. Crops respond well to fertilizer and lime, which can improve soil fertility and reduce the levels of exchangeable aluminum.

This soil is moderately well suited to pasture. It is limited mainly by low fertility and the hazard of erosion. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, and crimson clover. Grasses respond to nitrogen fertilizer. Lime is generally needed for optimum growth of grasses and legumes.

This soil is moderately well suited to urban development. Steepness of slope is the main limitation for most uses. Disturbed areas around construction sites can be vegetated as soon as possible to control soil erosion. Septic tank absorption lines can be installed on the contour to prevent seepage of effluent on side slopes. Seepage can be a hazard where sanitary landfills are constructed. This can be overcome by coating the floor and walls of the landfill with an impervious material.

This soil is moderately well suited to recreational uses. The main limitation is steepness of slope. Maintaining a vegetative cover on recreational areas helps to control runoff and soil erosion.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Woodland wildlife habitat is improved where oak and other mast-producing trees are preserved. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons.

This Smithdale soil is in capability subclass VIe. The woodland ordination symbol is 8A.

So=Smithton fine sandy loam, 0 to 2 percent slopes

This soil is nearly level and poorly drained. It is on low stream terraces. The areas of this soil are narrow or irregular in shape and range from 10 to 200 acres.

Typically, the surface layer is grayish brown fine sandy loam about 5 inches thick. The subsurface layer to a depth of about 14 inches is light brownish gray, mottled fine sandy loam. From top to bottom, the layers of the subsoil to a depth of about 60 inches are light brownish gray sandy loam; light brownish gray, mottled fine sandy loam; gray, mottled sandy loam; and light brownish gray, mottled loam.

This soil has low fertility and moderately high levels of exchangeable aluminum in the root zone. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table ranges from the surface to 1 foot below the surface from December to May. Flooding is rare, but it can occur during unusually wet periods. The available water capacity is moderate to high.

Included with this soil in mapping are a few small areas of Guyton, Harleston, Iuka, Malbis, and Ochlockonee soils. Guyton, Iuka, and Ochlockonee soils are on flood plains. Iuka and Ochlockonee soils do not have a well developed subsoil. Guyton soils contain more silt and clay in the subsoil than the Smithton soil. Harleston soils are slightly higher on the landscape than the Smithton soil. Malbis soils are on uplands. Both Harleston and Malbis soils are moderately well drained and have a brownish subsoil. The included soils make up about 10 percent of the map unit.

This Smithton soil is used mainly as woodland. Small acreages are used as pastureland or cropland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is high. The main limitations to use and management are a restricted use of equipment and severe seedling mortality caused by wetness. Also, plant competition is severe. Logging during the drier periods helps to prevent rutting and soil compaction. Proper site preparation controls initial plant competition, and spraying controls subsequent growth. Seedling survival rates can be increased by providing drainage or by using special site preparation, such as bedding and harrowing.

This soil is moderately well suited to cultivated crops. Seasonal wetness, low fertility, and moderately high levels of exchangeable aluminum in the root zone are the main limitations, and erosion is a slight hazard. In some years, flooding can delay planting dates. Suitable crops are cotton, soybeans, corn, and wheat. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by subsoiling when the soil is dry. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Crops respond well to fertilizer and lime, which improve soil fertility and reduce the high levels of exchangeable aluminum. Early fall seeding and conservation tillage help to control erosion.

This soil is moderately well suited to pasture. Wetness and low fertility are the main limitations. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, crimson clover, and ryegrass. Proper grazing, weed control, and fertilizer are needed for maximum quality of forage.

This Smithton soil is poorly suited to urban development. Wetness and moderately slow permeability are the main limitations. Rare flooding is a hazard. Preserving the existing plant cover during construction helps to control erosion. Drainage can be improved around buildings by providing the proper grade. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly.

This soil is poorly suited to recreational uses mainly because of wetness and the hazard of flooding. Drainage can improve this soil for most intensive recreational uses. Flooding can be reduced, but only by large earthen levees, diversions, and water pumps.

This soil has fair potential as habitat for woodland, openland, and wetland wildlife. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer, turkeys, and squirrels. Habitat for waterfowl and furbearers can be improved by constructing shallow ponds.

This Smithton soil is in capability subclass IIIw. The woodland ordination symbol is 9W.

St=Sterlington very fine sandy loam, 1 to 3 percent slopes

This soil is very gently sloping and well drained. It is on natural levees bordering the Ouachita River and other former channels and distributaries of the old Arkansas River. The areas of this soil are long and narrow and range from about 10 to 100 acres.

Typically, the surface layer is brown very fine sandy loam about 3 inches thick. The subsurface layer is brown very fine sandy loam to a depth of about 10 inches. The upper part of the subsoil to a depth of about 18 inches is yellowish red, mottled silt loam. The next layer to a depth of 25 inches is yellowish red silt loam and light brown very fine sandy loam. The lower part of the subsoil to a depth of about 42 inches is yellowish red and light brown silt loam. The substratum to a depth of about 60 inches is brown very fine sandy loam. In places, the soil has slopes of 3 to 5 percent.

This Sterlington soil has medium fertility. It has high levels of exchangeable aluminum in the root zone. Water and air move through this soil at a moderate rate. Water runs off the surface at a slow rate. A seasonal high water table is more than 6 feet below the surface throughout the year. The available water capacity is high to very high. The shrink-swell potential is low. Flooding is rare, but it can occur during unusually wet periods.

Included with this soil in mapping are a few small areas of Hebert soils. Hebert soils are in lower positions and contain more clay in the subsoil than the Sterlington soil. The included soils make up about 15 percent of the map unit.

This Sterlington soil is used mainly for cultivated crops. Small acreages are used as pastureland, woodland, or homesites.

This soil is well suited to use as woodland. The potential for production of hardwoods is high, but few areas remain in forest. The main concern in forest management is plant competition. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants.

This soil is moderately well suited to cultivated crops. The main limitations are steepness of slope and moderately high levels of exchangeable aluminum. The main suitable crops are cotton, soybeans, corn, grain sorghum, and vegetables. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Conservation tillage can be done on the contour or across the slope to help control erosion. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Most crops respond to fertilizer and lime, which improve soil fertility and reduce the high levels of exchangeable aluminum in the root zone.

This soil is well suited to pasture. Steepness of slope and medium fertility are minor limitations to this use. The main suitable pasture plants are improved bermudagrass, common bermudagrass, bahiagrass, tall fescue, white clover, winter peas, and vetch. The hazard of erosion can be reduced if seedbed preparation is done on the contour or across the slope where practical. Fertilizer and lime are needed for optimum growth of grasses and legumes. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

This soil is poorly suited to urban development. Rare flooding is the main hazard to this use. It has few soil limitations for building sites, local roads and streets, and most sanitary facilities. Seepage can be a hazard for sewage lagoons. This can be overcome by coating the floor and walls of the lagoon with an impervious material. Flooding can be controlled, but only by major flood-control structures, such as levees and water pumps.

This soil is moderately well suited to recreational uses. It has few limitations for this use; however, steepness of slope is a limitation for playgrounds. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover.

This soil has good potential as habitat for openland and woodland wildlife and poor potential as habitat for wetland wildlife. Habitat for openland wildlife species, such as rabbits, doves, and quail, can be created by planting seed-producing vegetation around field borders and in odd areas. Management that enhances the growth of oak or other mast-producing trees can improve the habitat for white-tailed deer and squirrels.

This Sterlington soil is in capability subclass IIe. The woodland ordination symbol is 3A.

Tr=Trep loamy fine sand, 1 to 5 percent slopes

This soil is gently sloping and moderately well drained. It is on ridgetops on uplands. The areas of this soil are irregular in shape and range from 30 to 350 acres.

Typically, the surface layer is brown loamy fine sand about 5 inches thick. The subsurface layer to a depth of about 34 inches is pale brown loamy fine sand in the upper part and very pale brown loamy fine sand in the lower part. The subsoil to a depth of about 60 inches is yellowish brown, mottled sandy clay loam in the upper part and mottled yellowish brown, yellowish red, red, and light brownish gray sandy clay loam in the lower part.

This soil has low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to crops. Water and air move through the upper part of this soil at a rapid rate and through the lower part at a moderate to moderately slow rate. The available water capacity is low to moderate. Water runs off the surface at a slow rate. A seasonal high water table is about 3.5 to 5 feet below the surface from November to May. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Angie, Bowie, Briley, Eastwood, and McLaurin soils. Angie and Eastwood soils are at a lower elevation than the Trep soil and have a loamy and clayey subsoil. Bowie, Briley, and McLaurin soils are in landscape positions similar to those of the Trep soil. Bowie and McLaurin soils are loamy throughout the profile. Briley soils have a reddish subsoil. The included soils make up about 15 percent of the map unit.

This Trep soil is used mainly as woodland. Small acreages are used as cropland or pastureland.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine is moderately high. The main concern in managing timber on this soil is moderate seedling mortality caused by soil droughtiness. Competition from unwanted understory plants is an additional concern. Seedling survival rates can be increased by planting in winter or spring when rainfall and the content of soil moisture are greatest. Proper site preparation controls initial growth of understory plants, and spraying, cutting, or girdling control subsequent growth.

This soil is moderately well suited to cultivated crops. The main limitations are soil droughtiness, low fertility, and moderately high levels of exchangeable aluminum in the root zone. Suitable crops are cotton, corn, watermelons, sweet potatoes, and wheat. This soil is very friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Sprinkler irrigation systems work well on this soil. Irrigation can prevent crop damage during dry periods of most years. Crops respond well to fertilizer and lime, which improve soil fertility and reduce the levels of exchangeable aluminum.

This soil is well suited to pasture; however, soil droughtiness and low fertility are limitations for this use. The main suitable pasture plants are weeping lovegrass, improved bermudagrass, common bermudagrass, bahiagrass, crimson clover, and ryegrass. Fertilizer and lime are needed for optimum production of forage. Periodic mowing and clipping help to maintain uniform growth, discourage selective grazing, and reduce clumpy growth.

This soil is moderately well suited to urban development. The main limitations are wetness, moderate to moderately slow permeability, and low strength for roads. Also, cutbanks are not stable and are subject to slumping. Seepage can be a problem in sewage lagoons and sanitary landfills. Revegetating disturbed areas around construction sites as soon as possible helps to control erosion. A seasonal high water table and moderate to moderately slow permeability increase the possibility for septic tank absorption fields to fail. Self-contained disposal units can be used to dispose of sewage properly. Roads can be designed to overcome the limited ability of the soil to support a load.

This soil is moderately well suited to recreational uses. The sandy surface layer is the main limitation. Steepness of slope is an additional limitation for playgrounds. The plant cover can be established by mulching, fertilizing, and irrigating.

This soil has good potential as habitat for woodland wildlife, fair potential as habitat for openland wildlife, and poor potential as habitat for wetland wildlife. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. In cropland areas, crop residue or crop stubble can be left on the surface over winter to provide food and cover for rabbits, quail, and turkeys.

This Trep soil is in capability subclass IIIs. The woodland ordination symbol is 9S.

Wc=Warnock fine sandy loam, 1 to 5 percent slopes

This soil is gently sloping and moderately well drained. It is on ridgetops on uplands. The areas of this soil are irregular in shape and range from about 20 to 500 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The next layer to a depth of about 9 inches is brown fine sandy loam. The subsurface layer to a depth of about 15 inches is light yellowish brown fine sandy loam. From top to bottom, the layers of the subsoil to a depth of about 60 inches are strong brown loam; strong brown, mottled sandy clay loam; mottled yellowish brown and red clay loam; and strong brown, mottled sandy clay loam.

This Warnock soil has low fertility and moderately high levels of exchangeable aluminum in the root zone. Water and air move through the upper part of the subsoil at a moderately rapid rate and through the lower part at a moderate rate. Runoff is medium, and the hazard of water erosion is moderate. A seasonal high water table is 4 to 6 feet below the surface from December to April. The available water capacity is moderate to high. The shrink-swell potential is low.

Included with this soil in mapping are a few small areas of Angie, Bowie, Kirvin, and Trep soils. All of these soils are in similar positions on the landscape as the Warnock soil. Kirvin soils are also on side slopes. Angie and Kirvin soils have a loamy and clayey subsoil. Bowie soils have more than 5 percent plinthite in the subsoil. Trep soils have a sandy surface layer and subsurface layer that together are 20 to 40 inches thick. The included soils make up about 10 percent of the map unit.

This Warnock soil is used mainly as woodland. Small acreages are used as pastureland or cropland.

This soil is well suited to use as woodland. The potential to produce pine trees is high. This soil has few limitations for use and management; however, management that reduces competition from unwanted understory plants increases productivity.

This soil is moderately well suited to cultivated crops. Low fertility, a moderate hazard of erosion, and moderately high levels of exchangeable aluminum in the root zone are the main limitations. The main crops grown are soybeans, corn, and sweet potatoes. This soil is friable and easy to keep in good tilth. It can be worked throughout a wide range in moisture content. Crop residue left on or near the surface helps to conserve moisture, control runoff, and maintain tilth and organic matter content. Farming on the contour also helps to control runoff and erosion. Most crops respond well to fertilizer and lime, which improve soil fertility and reduce the high levels of exchangeable aluminum.

This soil is well suited to pasture. Low fertility and steepness of slope are the main limitations. Erosion is a hazard during the establishment of grasses. Suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, ball clover, crimson clover, and arrowleaf clover. Rotational grazing helps to maintain the quality of forage. Fertilizer is needed for optimum growth of grasses and legumes. The hazard of erosion can be reduced if seedbeds are placed on the contour or across the slope.

This soil is moderately well suited to urban development. Wetness and moderate permeability are limitations where this soil is used as septic tank absorption fields. Use of sandy backfill for the trench and long absorption lines help to compensate for the moderate permeability. There are few limitations for dwellings. Preserving the existing plant cover during construction helps to control erosion. Low strength is a limitation for roads.

This soil is well suited to recreational uses. It has few limitations for this use; however, steepness of slope is a limitation for playgrounds. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover.

This soil has good potential as habitat for woodland and openland wildlife and very poor potential as habitat for wetland wildlife. Dominant wildlife species are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Woodland wildlife habitat is improved where management favors the growth of oak and other mast-producing trees. Controlled burning in wooded areas can increase the amount of browse palatable to deer and seed-producing plants for quail, turkey, and other nongame birds. In agricultural areas, small areas of grain can be left for food patches near good wildlife cover.

This Warnock soil is in capability subclass IIIe. The woodland ordination symbol is 9A.

Wr=Wrightsville silt loam, occasionally flooded

This soil is level and poorly drained. It is on low stream terraces adjacent to the flood plains of the Ouachita River. This soil is subject to occasional overflow from the Ouachita River. The areas of this soil are irregular in shape and range from about 40 to 500 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is grayish brown silt loam about 4 inches thick. The subsurface layer to a depth of about 19 inches is gray, mottled silt loam in the upper part and light gray silt loam in the lower part. The next layer to a depth of about 31 inches is grayish brown, mottled silty clay and tongues of light gray silt loam. The subsoil to a depth of about 60 inches is light brownish gray, mottled silty clay.

This Wrightsville soil has low fertility. It has high levels of exchangeable aluminum in the root zone. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of 0.5 to 1.5 feet below the surface during December through April. This soil is occasionally flooded by overflow from streams for brief to long periods during any time of the year. The depth of floodwater is generally less than 5 feet. The shrink-swell potential is high in the subsoil. The available water capacity is high to very high.

Included with this soil in mapping are a few small areas of Groom, Guyton, Libuse, Perry, and Portland soils. Groom and Guyton soils are in landscape positions similar to those of the Wrightsville soil and are loamy throughout the profile. Guyton soils are also on flood plains. Libuse soils are in higher positions and have a fragipan. Perry and Portland soils are on flood plains and have a clayey subsoil that is reddish in some part. The included soils make up about 10 percent of the map unit.

This Wrightsville soil is used mainly as woodland. In a few areas, it is used as pastureland or for cultivated crops.

This soil is moderately well suited to use as woodland. The potential for production of loblolly pine and hardwoods is moderate. The use of equipment is restricted by flooding and wetness. Seedling mortality is moderate, and plant competition is severe. After harvesting, reforestation can be carefully managed to reduce competition from undesirable understory plants. Only trees that can tolerate seasonal wetness should be planted. Drainage or special site preparation, such as bedding or harrowing, can improve the rate of seedling survival. Rutting and soil compaction can be reduced by planting and harvesting only during the drier seasons.

This soil is poorly suited to cultivated crops, mainly because of the hazard of flooding. Suitable crops are rice and soybeans. The main limitations are wetness, low fertility, and high levels of exchangeable aluminum in the root zone. Drainage can improve this soil for growing most cultivated crops. Proper irrigation systems can be used to grow rice. Crop residue management helps to maintain content of organic matter and reduce surface crusting. Most crops respond well to fertilizer and lime, which improve soil fertility and reduce the high levels of exchangeable aluminum in the root zone.

This soil is moderately well suited to pasture. Wetness and low fertility are the main limitations. Flooding is a hazard. Suitable pasture plants are common bermudagrass, bahiagrass, white clover, vetch, and winter peas. A drainage system is needed for most pasture plants. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. During periods of flooding, cattle can be moved to adjacent protected areas or to pastures at higher elevations. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is poorly suited to urban development. The main limitations are wetness, very slow permeability, low strength for roads and streets, and high shrink-swell potential. Flooding is a hazard. Flooding can be reduced by major flood-control structures. Roads and streets should be located above the expected flood level and designed to offset the limited ability of the soil to support a load. If buildings are constructed, properly designing foundations and footings and diverting runoff away from buildings help to prevent the structural damage caused by shrinking and swelling. Septic tank absorption fields do not function properly during rainy periods because of wetness and very slow permeability. If flooding is controlled, lagoons can be used to dispose of sewage properly.

This soil is poorly suited to recreational uses. Flooding is a severe hazard. Wetness and very slow permeability are soil limitations. Flooding can be reduced, but only by major flood-control structures, such as levees and water pumps.

This soil has good potential as habitat for wetland wildlife and fair potential as habitat for openland and woodland wildlife. Habitat for waterfowl and furbearers can be created by constructing shallow ponds. Habitat for white-tailed deer and squirrels can be improved by encouraging the growth of oak and other mast-producing trees.

This Wrightsville soil is in capability subclass IVw. The woodland ordination symbol is 4W.

Prime Farmland

In this section, prime farmland is defined, and the soils in Union Parish that are considered prime farmland are listed.

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

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

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

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent.

The following map units are considered prime farmland in Union Parish. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Some soils that have a high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. The following list contains only those soils that have few limitations and need no additional improvements to qualify as prime farmland.

The soils identified as prime farmland in Union Parish are:

An	Angie very fine sandy loam, 1 to 5 percent slopes
Bh	Bowie fine sandy loam, 1 to 5 percent slopes
Ca	Cahaba fine sandy loam, 1 to 5 percent slopes
Dk	Darley gravelly fine sandy loam, 1 to 5 percent slopes
Fr	Frizzell silt loam
Gu	Guyton silt loam
Hd	Harleston fine sandy loam, 1 to 3 percent slopes
He	Hebert silt loam, occasionally flooded
Kn	Kirvin fine sandy loam, 1 to 5 percent slopes
Le	Libuse silt loam, 1 to 5 percent slopes
Ma	Mahan fine sandy loam, 1 to 5 percent slopes
Mn	Malbis fine sandy loam, 1 to 5 percent slopes
Mr	McLaurin fine sandy loam, 1 to 5 percent slopes
Or	Ora fine sandy loam, 1 to 5 percent slopes
Rs	Ruston fine sandy loam, 1 to 5 percent slopes
Sa	Sacul very fine sandy loam, 1 to 5 percent slopes
Sg	Savannah fine sandy loam, 1 to 5 percent slopes
Sk	Sawyer silt loam, 1 to 5 percent slopes
So	Smithton fine sandy loam, 0 to 2 percent slopes
St	Sterlington very fine sandy loam, 1 to 3 percent slopes
Wc	Warnock fine sandy loam, 1 to 5 percent slopes

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 to prevent 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 behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational 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 that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where a cemented pan, 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

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources 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 the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

About 65,151 acres in Union Parish was in farms in 1987, according to the United States Census of Agriculture. Harvested cropland totaled 3,516 acres. About 36,609 acres was used as improved and native grass pastureland. Small grains and ryegrass grown for winter forage, hay, corn, watermelons, sweet potatoes, fruit, cotton, and vegetables other than watermelons and sweet potatoes were the main crops grown in 1989, according to the Louisiana Summary of Agriculture and Natural Resources.

Differences in crop suitability and management needs result from differences in soil characteristics, such as fertility level, erodibility, organic matter content, availability of water for plants, drainage, and the hazard of flooding. Cropping systems and soil tillage are an important part of management. Each farm has a unique soil pattern; therefore, each has unique management problems. Some principles of farm management, however, apply only to specific soils and certain crops. This section presents the general principles of management that can be widely applied to the soils of Union Parish.

Pasture and Hayland

Perennial grasses or legumes or mixtures of these are grown for pasture and hay. The mixture generally consists of either a summer or a winter perennial grass and a suitable legume. Also, many farmers seed small grain or ryegrass in the fall for winter and spring forage. Excess grass in summer is harvested as hay for the winter.

Common and improved bermudagrass and Pensacola bahiagrass are the summer perennials most commonly grown. Most of these grasses produce good quality forage. Tall fescue, the main winter perennial grass, grows well only on soils that have a favorable moisture content. All of these grasses respond well to fertilizers, particularly nitrogen.

White clover, crimson clover, vetch, and winter peas are the most commonly grown legumes. All of these respond well to lime, particularly on acid soils.

Proper grazing is essential for high quality forage, stand survival, and erosion control. Brush and weed control, application of fertilizer and lime, and renovation of the pasture are also important.

Forage production can be increased by grazing the understory native plants in woodland. Forage volume varies with the woodland site, the condition of the native forage, and the density of the timber stand. Although most woodland is managed mainly for timber, substantial volumes of forage can be obtained if these areas are properly managed. Stocking rates and grazing periods need to be carefully managed for optimum forage production and to maintain an adequate cover of understory plants to control erosion. Additional information on the production of forage in woodland is in the section, "Woodland Management and Productivity".

Fertilization and Liming

The soils of Union Parish range from extremely acid to neutral in the upper 20 inches. Most soils used for crops are low in organic matter content and available nitrogen. They generally need lime and a complete fertilizer for crops and pasture plants. The amount of fertilizer needed depends on the kind of crop, on past cropping history, on the level of yield desired, and on the kind of soil. The amount should be determined on the basis of soil test results. Information and instructions on collecting and testing soil samples can be obtained from the Cooperative Extension Service.

Organic Matter Content

Organic matter is an important source of nitrogen for crops. It also increases the rate of water intake, reduces surface crusting, and improves tilth. In Union Parish, most soils used for crops, especially those that have a silt loam, fine sandy loam, or loamy fine sand surface layer, are low in organic matter content. The level of organic matter can be maintained by growing crops that produce an extensive root system and an abundance of foliage, by leaving plant residue on the surface, by growing perennial grasses and legumes in rotation with other crops, and by adding barnyard manure.

Soil Tillage

Soils should be tilled only enough to prepare a seedbed and to control weeds. Excessive tillage destroys soil structure. Conservation tillage helps to maintain soil tilth. A compacted layer, generally known as a traffic pan or plowpan, sometimes develops just below the plow layer in loamy soils. This condition can be avoided by not plowing when the soil is wet or by varying the depth of plowing. If a plowpan develops, it can be broken up by subsoiling or chiseling. Tillage implements that stir the surface but leave crop residue in place protect the soil from beating rains, thereby helping to control erosion, reduce runoff and surface crusting, and increase infiltration.

Drainage

Some of the soils in the parish need surface drainage to make them more suitable for crops. A properly designed system of field ditches can remove excess water from seasonally wet soils, such as the Frizzell soils; however, major flood-control structures are needed to protect the Groom, Guyton, Haggerty, Hebert, Iuka, Litro, Ochlockonee, Ouachita, Perry, and Portland soils from stream overflow.

Control of Erosion

Water erosion is a major hazard on many soils in Union Parish. It is an especially serious problem on the soils on terraces and on uplands. Sloping soils, such as Ruston and Smithdale soils, are highly susceptible to erosion when left without plant cover for extended periods. If the surface layer of the soil is eroded away, most of the available plant nutrients and organic matter are also lost. Soils that have a fragipan, such as Libuse and Savannah soils, especially need protection against water erosion. Soil erosion also results in sedimentation of drainage systems and pollution of streams by sediments, nutrients, and pesticides.

Cropping systems in which a plant cover is maintained on the soil for extended periods reduce soil erosion. Legume or grass cover crops help to control water erosion, increase the content of organic matter and nitrogen in the soils, and improve tilth. Terraces, diversions, grassed waterways, conservation tillage, contour farming, and cropping systems that rotate grass or close-growing crops with row crops, help to control erosion on cropland and pastureland. Constructing water-control structures in drainageways to drop water to different levels can prevent gullying.

Cropping System

A good cropping system includes a legume for nitrogen, a cultivated crop to aid in weed control, a deep-rooted crop to utilize subsoil fertility and maintain subsoil permeability, and a close-growing crop to maintain the content of organic matter. The sequence of crops should keep the soil covered as much of the year as possible.

A suitable cropping system varies according to the needs of the farmer and the characteristics of the soil. Producers of livestock, for example, generally use cropping systems that have higher percentages of pasture than the cropping system used on cash-crop farms.

Additional information on erosion control, cropping systems, and drainage practices can be obtained from the local office of the Natural Resources Conservation Service, the Cooperative Extension Service, or the Louisiana Agricultural Experiment Station.

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 5. 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 ensures the smallest possible loss.

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 the table 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 Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

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

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

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

Crops other than those shown in table 5 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 Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Woodland Management and Productivity

Donald J. Lawrence, area forester, Natural Resources Conservation Service, helped to prepare this section.

Woodland Resources

This section has information on the relation between trees and their environment, particularly trees and the soils in which they grow. It includes information on the kind, amount, and condition of woodland resources in Union Parish. This section also includes soils interpretations that can be used in planning.

Union Parish has about 477,100 acres of commercial woodland or timberland (28). These timbered acres make up about 82 percent of the total land area. Commercial woodland is defined as that producing or capable of producing crops of industrial wood and not withdrawn from timber use. About 30 percent of the commercial woodland is owned by the forest industry and 49 percent by individuals. About 8 percent is public land in the Upper Ouachita and D'Arbonne National Wildlife Refuges and in the Union Wildlife Management Area.

Soils vary in their ability to produce trees. Available water capacity and depth of the root zone have major effects on tree growth. Fertility and texture also influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site. Elevation and aspect are of particular importance in mountainous areas.

These soil, climate, and landscape characteristics, in combination, largely determine the forest stand species composition and influence management and utilization decisions. Sweetgum, for example, is tolerant of many soils and sites but grows best on rich, moist, and alluvial loamy soils of river bottoms. Use of heavy logging and site-preparation equipment is more restricted on clay soils or soils with a clayey subsoil, such as the Eastwood soils, than on better drained sandy or loamy soils, such as the Bienville, Boykin, Cahaba, or Ruston soils.

Commercial woodland may be divided into forest types. Types can be based on tree species, site quality, or age. As used in this survey, forest types are stands of trees of similar character, composed of the same species, and growing under the same ecological and biological conditions. The forest types are named for the dominant trees.

The loblolly-shortleaf pine forest type makes up about 208,700 acres of the forest land in the parish. Loblolly pine generally is dominant except on drier sites. Scattered hardwoods such as sweetgum, blackgum, southern red oak, post oak, white oak, mockernut hickory, and pignut hickory can be mixed with pines on well drained soils. American beech and ash are associated with this forest type along stream bottoms.

The oak-pine forest type makes up about 65,600 acres of the forest land in the parish. On the drier sites the hardwood components tend to be post oak, southern red oak, and blackjack oak. Red maple, blackgum, winged elm, and various hickory trees are associated with this type along stream bottoms.

The oak-gum-cypress forest type makes up about 101,400 acres of the forest land in the parish. This forest type is on the bottom land of major streams. Dominant trees are blackgum, sweetgum, oak, and baldcypress. Associated trees are black willow, ash, maple, hackberry, and winged elm.

The oak-hickory forest type makes up about 101,400 acres of the forest land in the parish. Upland oaks or hickory, singly or in combination, make up a plurality of the stocking. Common associates are maple and winged elm.

About 5,500 acres of the forest land in the parish is not placed in a forest type.

The marketable timber volume in Union Parish is about 73 percent pine and 27 percent hardwood. About 59 percent of the forest acreage is sawtimber, 15 percent is seedlings and saplings, and 21 percent is pole timber. The remaining 2 percent is classified as "non-stocked areas."

The productivity of forestland is the amount of wood produced per acre per year measured in cubic feet. In Union Parish about 2 percent of the forest land produces 165 cubic feet or more per acre, 29 percent produces 120 to 165 cubic feet per acre, 49 percent produces 85 to 120 cubic feet per acre, 18 percent produces 50 to 80 cubic feet per acre, and 2 percent produces less than 50 cubic feet per acre.

The importance of timber production to the economy of the parish is significant. About one-third of the upland pine sites are owned by the forest industry. These forests are generally well managed. However, the small, privately

Figure 9.—Controlled burning in an area of Malbis fine sandy loam, 1 to 5 percent slopes. The burning removes competing understory vegetation.

owned tracts are producing well below potential and would benefit if stands were improved by thinning out mature and undesirable species. Protection from overgrazing, fire, insects, and diseases; tree planting; and timber stand improvement are needed to improve stands. Controlled burning removes excess duff and controls competing understory vegetation (fig. 9).

Specific forestry practices that help conserve soil moisture, maintain soil fertility and aeration and soil organic matter content, and prevent compaction of the soil include: (1) using special methods for site preparation other than mechanical, (2) using the roller drum chopper instead of shear and windrow if mechanical site preparation is used, (3) postponing site preparation and harvesting on wet soils, (4) using logging slash to protect and conserve soil, (5) treating critically eroding areas, (6) leaving filter strips along streams, and (7) properly installing logging and access roads, water-control and drainage systems, and stream crossings.

The Natural Resources Conservation Service, Louisiana Office of Forestry, or the Louisiana Cooperative Extension Service can help determine specific woodland management needs.

Environmental Impact. Woodland is valuable for wildlife habitat, recreation, natural beauty, forage, and conservation of soil and water. The commercial forest land of Union Parish provides food and shelter for wildlife and offers opportunity for sport and recreation to many users annually. Forests provide watershed protection, help to arrest soil erosion and reduce sedimentation, and enhance the quality and value of water resources.

Trees can be planted to screen distracting views of dumps and other unsightly areas, muffle the sound of traffic, reduce the velocity of winds, and lend beauty to the landscape. They produce fruits and nuts for use by people as well as wildlife. Trees and forests help filter out airborne dust and other impurities, convert carbon dioxide into life-giving oxygen, release moisture to the atmosphere, and provide shade from the sun's hot rays.

Production of Forage on Woodland

The kind and amount of understory vegetation that can be produced in an area are related to the soils, the climate, and the extent of the overstory. Grazing is not recommended in areas of hardwoods. In many areas of pine woodland, however, grazing by cattle or horses can be a compatible secondary use. The native vegetation can be grazed, or improved pasture grasses can be interseeded in the wooded areas. Grasses, legumes, forbs, and many woody browse species in the understory can be grazed, but the grazing should be managed so that it supplements the woodland enterprise without damaging the wood crop. In most areas of pine woodland, grazing is beneficial to the woodland program because it reduces the accumulation of heavy "rough", thus reducing the hazard of wildfires. Grazing also helps to remove undesirable woody plants.

The success of a combined woodland and livestock program depends primarily on the intensity and time of grazing. The proper intensity of grazing helps to maintain a protective plant cover and maintains or improves the quantity and quality of trees and forage vegetation.

Forage production varies depending on the type of woodland and the amount of sunlight that reaches the understory vegetation during the growing season. Soils that have about the same potential for producing trees also have similar potential for producing about the same kind and amount of understory vegetation. The plant community on these soils can reproduce itself as long as the environment does not change.

Research has established that there is a close correlation between the total potential yield of grasses, legumes, and forbs and the amount of sunlight reaching the ground at midday in the forest. Herbage production declines as the forest canopy becomes denser.

One of the main management objectives is to keep the woodland forage in excellent or good condition. If this objective is met, water is conserved, yields are improved, and the soils are protected.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. Table 6 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

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

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

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

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. On the steeper slopes, tracked equipment is needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if wetness restricts equipment use for more than 6 months per year, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

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

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition is more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants hinders adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants hinders natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A moderate or severe rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *volume* number. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. The estimates of the productivity of the soils in this survey are based on the site index that was determined at age 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species.

The *volume* is the yield likely to be produced by the most important trees, expressed in cubic feet per acre per year calculated at the age of culmination of mean annual increment.

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

Recreation

In table 7, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In the table, 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 a combination of these measures.

The information in the table can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

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

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

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

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

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

Wildlife Habitat

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 8, 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 flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, and grain sorghum.

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, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, bahiagrass, bermudagrass, clover, and vetch.

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 flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, switchgrass, and lespedeza.

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, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, hawthorn, dogwood, hickory, blackberry, and dewberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are redbay, red-mulberry, and mayhaw.

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

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are waxmyrtle, American beautyberry, elderberry, and huckleberry.

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, 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 a cemented pan, 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. Wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

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

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

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for 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 should 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 a cemented pan within 5 or 6 feet of the surface, 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 kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

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

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

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

Building Site Development

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings 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 the depth to a cemented pan or 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 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 and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and shrink-swell potential can cause the movement of footings. Depth to a high water table, depth to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

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

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to a cemented pan, 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 10 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.

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

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

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand 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 filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

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

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

Excessive seepage resulting from rapid permeability in 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 and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

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 should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a cemented pan, depth to a water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench 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 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 or silty 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 a cemented pan or the water table to permit revegetation. The soil material used as the 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 11 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 to 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 large stones, 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, a 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 a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of 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. They are used in many kinds of construction. Specifications for each use vary widely. In the table, 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), the thickness of suitable material, and the content of rock fragments. Kinds of rock, 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. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

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

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, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

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

Water Management

Table 12 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; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

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

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches (fig. 10). The seepage potential is determined by the permeability of the

Figure 10.—A small pond in an area of Sacul very fine sandy loam, 1 to 5 percent slopes. It can be stocked with fish to provide opportunities for sport fishing.

soil and the depth to permeable material. Excessive slope can affect the storage capacity of the reservoir area.

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

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

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

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface.

Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and the salinity of the soil. Depth to a cemented pan and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to a cemented pan or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; and susceptibility to flooding. Excavating and grading and the stability of ditchbanks are affected by depth to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts or sodium. Availability of drainage outlets is not considered in the ratings.

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

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion 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. Large stones, wetness, slope, and depth to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, 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.

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

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, 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 13 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 the heading "Soil Series and Their Morphology."

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

Classification of the soils is determined according to the Unified soil classification system *(3)* and the system adopted by the American Association of State Highway and Transportation Officials *(2)*.

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.

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 generally 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 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

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

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

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

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

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

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for 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 classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

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

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

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in 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 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the infiltration 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 covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

The table 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 generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than a 50 percent in any year). *Common* is used when the occasional and frequent classes are grouped for certain purposes. Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is 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 estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table, that is, *perched* or *apparent*; and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in the table.

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.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

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

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

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

Soil Fertility Levels

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This section contains information on both the environmental factors and the physical and chemical properties of the soils that affect their potential for crop production. It also lists the analytical methods that were used to determine the chemical properties of the sampled soils.

Factors Affecting Crop Production

Crop composition and yield are a function of many environmental, plant, and soil factors.

Environmental Factors. The main environmental factors are light (intensity and duration), temperature (air and soil), precipitation (distribution and amount), and atmospheric carbon dioxide concentration.

Plant Factors. These factors are species and hybrid specific. They include the rate of nutrient and water uptake and the rate of growth and related plant functions.

Quantity/Intensity Relationship Factor. This describes the relationship between the quantity and intensity factors and is sometimes called the buffer power. As the plant root absorbs nutrients from soil solution, the concentration in solution is replenished by ions from the solid phase. If two soils have identical intensity factors, the soil with the greater quantity factor will provide more nutrients during the growing season, since it will be able to maintain the intensity factor level for a longer period.

Replenishment Factor. This factor is the rate of replenishment of the available supply of nutrients in the solid and solution phases by weathering reactions, fertilizer additions, and transport by mass flow and diffusion.

These factors are interdependent. The magnitude of the factors and the interactions among them control crop response. The relative importance of each factor changes from soil to soil, crop to crop, and environment to environment. The soil factors are only part of the overall system.

The goal of soil testing is to provide information for a soil and crop management program that establishes and maintains optimum levels and balance of the essential elements in soil for crop and animal nutrition and that protects the environment against the buildup of potentially toxic levels of essential and nonessential elements. Current soil tests attempt to measure the available supply of one or more nutrients in the plow layer. The available supply consists of nutrients characterized by both the intensity and quantity factors. Where crop production is clearly limited by available supply of one or more nutrients, existing soil tests can generally diagnose the problem, and reliable recommendations to correct the problem can be made. Soil management systems generally are based on physical and chemical alteration of the plow layer. Characteristics of this layer can vary from one location to another, depending upon management practices and soil use.

Subsurface horizons are less subject to change or change very slowly as a result of alteration of the plow layer. These horizons reflect the soil's inherent ability to supply nutrients to plant roots and to provide a favorable environment for root growth. If soil fertility recommendations based on current soil tests are followed, major fertility problems in the plow layer are normally corrected. Crop production is then limited by crop and environmental factors, physical properties of the plow layer, and physical and chemical properties of the subsoil.

Chemical Analysis Methods

Information on the available nutrient supply in the subsoil allows evaluation of the natural fertility levels of the soil. Soil profiles were sampled during the soil survey and analyzed for soil reaction; organic matter content; extractable phosphorus; exchangeable cations of calcium, magnesium, potassium, sodium, aluminum, and hydrogen; total acidity; and cation-exchange capacity. The results are summarized in Table 16. More detailed information on chemical analysis of soils is available (1, 7, 8, 9, 18, 19, 20, 21, 22, 23, 26, 27, 31, 33). The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (31).

pH—1:1 soil/water solution (8Cla).

Organic matter—acid-dichromate oxidation (6Ala).

Extractable phosphorus—Bray 2 extractant (0.03 molar ammonium fluoride - 0.1 molar hydrochloric acid).

Exchangeable cations—pH 7, 1 molar ammonium acetate-calcium (6N2), magnesium (602), potassium (6Q2), sodium (6P2).

Exchangeable aluminum and hydrogen—1 molar potassium chloride (6G2).

Total acidity—pH 8.2, barium chloride-triethanolamine (6H1a).

Effective cation-exchange capacity—sum of bases plus exchangeable aluminum and hydrogen (5A3b).

Sum cation-exchange capacity—sum of bases plus total acidity (5A3a).

Base Saturation—sum of cations/sum cation-exchange capacity (5C3).

Exchangeable sodium percentage—exchangeable sodium/sum cation-exchange capacity.

Aluminum saturation—exchangeable aluminum/effective cation-exchange capacity.

Characteristics of Soil Fertility

In general, four major types of nutrient distribution in soils of Louisiana can be identified. The first type includes soils that have relatively high levels of available nutrients throughout the profile. This type reflects the relatively high fertility status of the parent material from which soils developed and a relatively young age or a less intense degree of weathering of the soil profile. The Perry and Portland soils in Union Parish are in this group.

The second type includes soils that have relatively low levels of available nutrients in the surface layer, but generally have increasing levels with depth through the soil profile. These soils have relatively fertile parent material but are older soils that have been subjected either to weathering over a longer period of time or to more intense weathering. If the levels of available nutrients in the surface layer are low, crops may exhibit deficiency symptoms early in the growing season. Deficiency symptoms often disappear if the crop roots are able to penetrate to the more fertile subsoil as the growing season progresses. The majority of the soils in Union Parish are in this group.

The third type includes soils that have adequate or relatively high levels of available nutrients in the surface layer but have relatively low levels in the subsoil. Such soils developed from low fertility parent material, or they are older soils that have been subjected to more intense weathering over a longer period of time. The higher nutrient levels in the surface layer generally are a result of fertilization in agricultural soils or biocycling in undisturbed soils. Soils such as the Betis and Boykin soils are in this group.

The fourth type includes soils that have relatively low levels of available nutrients throughout the soil profile. These soils developed from low fertility parent material, or they are older soils that have been subjected to intense weathering over a long period of time. Neither fertilization nor biocycling has contributed to nutrient levels in the surface layer of these soils. Ochlockonee soils are in this group.

Soil reaction and acidity, organic matter content, sodium content, and cation-exchange capacity also can provide evidence of the general nutrient distribution patterns in soils. Distribution patterns are the result of the interactions of parent material, weathering (climate), time, and to a lesser extent organisms and topography.

Nitrogen. Generally, over 90 percent of the nitrogen in the surface layer is in the form of organic nitrogen. Most of the nitrogen in the subsoil is in the form of fixed ammonium nitrogen. These forms of nitrogen are unavailable for plant uptake, but they can be converted to readily available ammonium and nitrate species.

Nitrogen generally is the most limiting nutrient element in crop production because of high plant demand. In most cases, nitrogen fertilizer recommendations are based on the nitrogen requirement of the crop rather than nitrogen soil test levels, because no reliable nitrogen soil tests have been developed for Louisiana soils.

Information on the nitrogen fertility status of a soil can be obtained by measuring several soil nitrogen parameters. These include the amount of readily available ammonium and nitrate nitrogen in the soil, the amount of organic nitrogen, the rate of mineralization of organic nitrogen to available forms of inorganic nitrogen, and the rate of conversion of fixed ammonium nitrogen to available forms of nitrogen. Unfortunately, since the amounts and rates of transformation of the various forms of nitrogen in the soils of Union Parish have not been determined, no assessment of the nitrogen fertility status for these soils can be given. However, fertilizer nitrogen recommendations obtained from the Louisiana Cooperative Extension Service may be used to determine application rates.

Phosphorus. Phosphorus exists in soils as inorganic phosphorus in soil solution; as discrete minerals, such as hydroxyapatite, variscite, and strengite; as occluded or coprecipitated phosphorus in other minerals; as phosphorus retained on the surfaces of minerals, such as carbonates, metal oxides, and layer silicates; and in organic compounds. Soil solution concentrations of phosphorus are generally low. Since plant roots obtain almost all phosphorus from the soil solution, phosphorus uptake depends on the ability of the soil solid phase phosphorus to maintain phosphorus concentration in soil solution. Soil test procedures generally attempt to measure soil solution phosphorus, plus the readily available solid phase phosphorus that buffers the solution phase concentration.

The Bray 2 (8) extractant tends to extract more phosphorus than the commonly used Bray 1 (8), Mehlich 1 (19), and Olsen (21) extractants. The Bray 2 extractant provides an estimate of both the readily available and slowly available supply of phosphorus in soils. The Bray 2 extractable phosphorus content of most of the soils in Union Parish is uniformly low throughout the soil profile, except where addition of fertilizer phosphorus has raised the level of extractable phosphorus in the surface layer. Exceptions are possibly the Hebert and Perry soils which are medium or high in extractable phosphorus content throughout the profile. Low levels of available phosphorus are a limiting factor in crop production. Continual addition of fertilizer phosphorus to such soils is needed to build up and maintain adequate levels of available phosphorus for sustained crop production.

Potassium. Potassium exists in four major forms in soils. These are soil solution potassium, exchangeable potassium associated with negatively-charged sites on clay mineral surfaces, nonexchangeable potassium trapped between clay mineral interlayers, and structural potassium within the crystal lattice of minerals. Exchangeable potassium in soils can be replaced by other cations and is generally readily available for plant uptake. To become available to plants, nonexchangeable potassium and structural potassium must be converted to exchangeable potassium through weathering reactions.

The exchangeable potassium content of the soils is an estimate of the supply available to plants. The available supply of potassium in the soils of Union Parish is very low to low throughout the soil profile. Low exchangeable potassium levels indicate a general lack of micaceous minerals, which are a source of exchangeable potassium during weathering.

Crops respond to fertilizer potassium if exchangeable potassium levels are very low to low. Low levels gradually can be built up adding fertilizer potassium to soils that contain a sufficient amount of clay to hold the potassium. Exchangeable potassium levels can be maintained by adding enough fertilizer potassium to account for crop removal, fixation of exchangeable potassium to nonexchangeable potassium, and leaching losses. The soils in Union Parish that have a sandier texture, such as Crevasse and Ochlockonee soils, do not have a sufficient amount of clay to hold the potassium; therefore, they do not have a sufficiently high cation-exchange capacity to maintain adequate quantities of available potassium for sustained crop production. More frequent additions of potassium are needed to balance losses of potassium by leaching in these soils.

Magnesium. Magnesium exists in soil solution, as exchangeable magnesium associated with negatively-charged sites on clay mineral surfaces and as structural magnesium in mineral crystal lattice. Solution and exchangeable magnesium generally are readily available for plant uptake, whereas structural magnesium must be converted to exchangeable magnesium during mineral weathering reactions.

According to soil test interpretation guidelines, the exchangeable magnesium content of the soils of Union Parish is low, medium, or high, depending upon soil texture. Low exchangeable magnesium levels are found throughout most of the soil profile in soils such as the Boykin and Briley soils. The Mahan and Guyton soils have low levels in the upper part of the profile and medium to high levels in the lower part. Variable levels throughout the profile are evident in the Sacul soils. Higher levels of exchangeable magnesium in certain soil horizons are generally associated with higher content of clay in those horizons.

The levels of exchangeable magnesium in most of the soils in Union Parish are more than adequate for crop production, especially where the plant roots can exploit the high levels found in the subsoil. Because magnesium deficiencies in plants are normally rare, fertilizer sources of magnesium are generally not needed for crop production.

Calcium. Calcium exists in soil solution as exchangeable calcium associated with negatively-charged sites on clay mineral surfaces and as structural calcium in mineral crystal lattices. Exchangeable calcium generally is available for plant intake while structural calcium is not.

Calcium deficiencies in plants are extremely rare. Calcium is normally added to soils from liming materials used to correct problems associated with soil acidity.

Some soils in Union Parish, such as Hebert, Perry, and Portland soils, have low or medium levels of exchangeable calcium in the upper part of the profile and medium to high levels in the lower part. Still other soils, such as Litro and Sacul soils, have variable levels throughout the soil profile. The higher levels of exchangeable calcium in the surface layer are normally associated with a higher soil reaction than in the subsoil and are probably the result of applications of lime to control soil acidity. Higher exchangeable calcium levels in the subsoil than in the surface layer generally are associated with a higher content of clay in the subsoil.

Calcium is normally the most abundant exchangeable cation in soils; however, the exchangeable magnesium levels in the subsoil of the Angie, Bowie, Darley, Groom, Kirvin, Libuse, Mahan, Malbis, Ruston, Sacul, Savannah, and Sawyer soils are greater than the exchangeable calcium levels. In the other soils in the parish, exchangeable calcium levels are greater than, or about the same as, the exchangeable magnesium levels.

Organic Matter. The organic matter content of a soil greatly influences other soil properties. High organic matter content in mineral soils is desirable, while low organic matter content can lead to many problems. Increasing the organic matter content can greatly improve the soil's structure, drainage, and other physical properties. It can also increase the moisture-holding capacity, cation-exchange capacity, and nitrogen content.

Increasing the organic matter content is very difficult, because organic matter is continually subject to microbial degradation. This is especially true in Louisiana where higher soil temperatures and water content increase microbial activity. The rate of organic matter degradation in native plant communities is balanced by the rate of input of fresh material. Disruption of this natural process can lead to a decline in the organic matter content of the soil. Unsound management practices lead to a further decrease in organic matter content.

If no degradation of organic matter occurs, 10 tons of organic matter addition will raise the organic matter content in the upper 6 inches of soil by just 1 percent. Since breakdown of organic matter does occur in the soil, addition of large amounts of organic matter to the soil are needed over a period of several decades to produce a small increase in the organic matter content. Conservation tillage and use of cover crops slowly increase the organic matter content over time, or at least prevent further declines.

The organic matter content of most of the soils of Union Parish is low. It decreases sharply with depth because fresh inputs of organic matter are confined to the surface layer. These low levels reflect the high rate of organic matter degradation, erosion, and use of cultural practices that make maintenance of organic matter at higher levels difficult.

Sodium. Sodium exists in soil solution as exchangeable sodium associated with negatively-charged sites on clay mineral surfaces and as structural sodium in mineral crystal lattices. Because sodium is readily soluble and is generally not strongly retained by soils, well drained soils subjected to moderate or high rainfall do not normally have significant amounts of sodium. Soils in low rainfall environments, soils that have restricted drainage in the subsoil, and soils of the coastal marsh may have significant amounts of sodium. High levels of exchangeable sodium in soils are associated with undesirable physical properties, such as poor structure, slow permeability, and restricted drainage.

Elevated exchangeable sodium levels are at depth in some soils, such as the Groom and Guyton soils. Higher than normal levels of exchangeable sodium in the soils are probably associated with restricted drainage in the subsoil. Levels of exchangeable sodium that make up more than 6 percent of the sum of the effective cation-exchange capacity in the rooting depth of summer annuals can create undesirable physical properties in soils, such as crusting of the surface, dispersion of soil particles, low water infiltration rates, and low hydraulic conductivity.

Exchangeable aluminum and hydrogen, pH, and exchangeable and total acidity. The pH of the soil solution in contact with the soil affects other soil properties. Soil pH is an intensity factor rather than a quantity factor. The lower the pH, the more acidic the soil. Soil pH controls the availability of essential and nonessential elements by controlling mineral solubility, ion exchange, and absorption-desorption reactions at the surfaces of the soil minerals and organic matter. The pH also affects microbial activity.

Aluminum exists in soils as exchangeable polymeric hydrolysis species, aluminum oxides, and aluminosilicate minerals. Exchangeable aluminum in soils is determined by extraction with neutral salts, such as potassium chloride or barium chloride. The exchangeable aluminum in soils is directly related to pH. If the pH is less than 5.5, the soils have significant amounts of exchangeable aluminum that has a charge of plus 3. The species of aluminum is toxic to plants. The toxic effects of aluminum on plant growth can be alleviated by adding lime to the soil to convert exchangeable aluminum to nonexchangeable polymeric hydrolysis species. High levels of organic matter can also alleviate aluminum toxicity.

Sources of exchangeable hydrogen in soils include hydrolysis of exchangeable and nonexchangeable aluminum and pH-dependent exchange sites on metal oxides, certain layer silicates, and organic matter. Exchangeable hydrogen, as determined by extraction with such neutral salts as potassium chloride, is normally not a major component of soil acidity. Exchangeable hydrogen is not readily replaced by other cations unless accompanied by a neutralization reaction. Most of the neutral salt exchangeable hydrogen in soils apparently comes from aluminum hydrolysis.

Acidity from hydrolysis of neutral salt exchangeable aluminum plus neutral salt exchangeable hydrogen from pH-dependent exchange sites makes up the exchangeable acidity in soils. Exchangeable acidity is determined by the pH of the soil. Titratable acidity is the amount of acidity neutralized to a selected pH, generally pH 7 or 8.2, and constitutes the total potential acidity of a soil. All sources of soil acidity, including hydrolysis of monomeric and polymeric aluminum species and hydrogen from pH-dependent exchange sites on metal oxides, layer silicates, and organic matter, contribute to the total potential acidity. Total potential acidity in soils is determined by titration with base or incubation with lime; extraction with a buffered extractant followed by titration of the buffered extractant (pH 8.2, barium chloride-triethanolamine method); or equilibration with buffers followed by estimation of acidity from changes in buffer pH.

Most soils of Union Parish have a low pH, contain significant quantities of exchangeable aluminum, and have high levels of total acidity in many of the soil horizons. Examples are Angie, Bowie, Cahaba, Darley, Frizzell, Groom, Guyton, Haggerty, Kirvin, Libuse, Litro, Malbis, Ora, and Ruston soils. The high levels of exchangeable aluminum are a major limiting factor in crop production. High levels of exchangeable aluminum in the surface layer of the soils can be reduced by adding lime. No economical methods are presently available to neutralize soil acidity at depth. Some reduction of exchangeable aluminum levels at depth can be achieved by applying gypsum so that the calcium leaches through the soil and replaces the exchangeable aluminum.

Cation-exchange capacity. The cation-exchange capacity is a measure of the amount of nutrient and non-nutrient cations a soil can hold in an exchangeable form. The cation-exchange capacity depends on the number of negatively-charged sites, both permanent and pH-dependent, present in the soil. Permanent charge cation-exchange sites occur because a net negative charge develops on mineral surface from substitution of ions within the crystal lattice. A negative charge developed from ionization of surface hydroxyl groups on minerals and organic matter produces pH-dependent cation-exchange sites.

Methods for determining cation-exchange capacity are available and can be classified as one of two types. These include methods that use unbuffered salts to measure the cation-exchange capacity at the pH of the soil and methods that use buffered salts to measure the cation-exchange capacity at a specific pH. These methods produce different results since the unbuffered salt methods include only a part of the pH-dependent cation-exchange capacity and the buffered salt methods include all of the pH-dependent cation-exchange capacity up to the pH of the buffer (pH 7 and 8.2). Errors in the saturation, washing, and replacement steps can also cause different results.

The effective cation-exchange capacity is the sum of exchangeable bases, which includes calcium, magnesium, potassium, and sodium. Effective cation-exchange capacity is determined by extraction with 1 molar ammonium acetate at pH 7 plus the sum of neutral salt-exchangeable aluminum and hydrogen (exchangeable acidity). The sum cation-exchange capacity is the sum of exchangeable bases plus the total acidity determined by extraction with pH 8.2, barium chloride-triethanolamine. The effective cation-exchange capacity is generally less than the sum cation-exchange capacity and includes only that part of the pH-dependent cation-exchange capacity that is determined by exchange of hydrogen with a neutral salt. The sum cation-exchange capacity includes all of the pH-dependent cation-exchange capacity up to pH 8.2. If a soil contains no pH-dependent exchange sites, or the pH of the soil is about 8.2, the effective and sum cation-exchange capacity will be about the same. The larger the cation-exchange capacity, the larger the capacity to store nutrient cation.

The pH-dependent charge is a significant source of the cation-exchange capacity in most soils of Union Parish. Since the pH-exchange cation-exchange capacity increases with pH, cation-exchange capacity of many of the soils can be increased by adding lime. This would result in a greater storage capacity for nutrient cations, such as potassium, magnesium, and calcium.

Physical and Chemical Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in table 17 and the results of chemical analysis in table 18. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(31)*.

Sand—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).

Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).

Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1).

Water retained—pressure extraction, percentage of oven-dry weight of less than 2 mm material; $^1/_3$ or $^1/_{10}$ bar (4B1), 15 bars (4B2).

Water-retention difference—between $^1/_3$ bar and 15 bars for whole soil (4C1).

Organic carbon—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c).

Extractable cations—ammonium acetate pH 7.0, atomic

absorption; calcium (6N2e), magnesium (6O2d), sodium (6P2d), potassium (6Q2b).
Cation-exchange capacity—ammonium acetate, pH 7.0, steam distillation (5A8b).
Base saturation—ammonium acetate, pH 7.0 (5C1).
Reaction (pH)—1:1 water dilution (8C1f).
Reaction (pH)—calcium chloride (8C1f).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(30)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven 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 Fluvent (*Fluv*, meaning river, 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 Udifluvents (*Udi*, meaning udic moisture regime, plus *fluvent*, the suborder of the Entisols that are on flood plains of rivers).

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 Udifluvents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, 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 coarse-loamy, siliceous, acid, thermic Typic Udifluvents.

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

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" *(29)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(30)*. 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."

Angie series

The Angie series consists of moderately well drained, slowly permeable soils that formed in loamy and clayey sediments. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the Angie series are clayey, mixed, thermic Aquic Paleudults.

Angie soils commonly are near Bowie, Eastwood, and Sacul soils. Bowie soils are on ridgetops at a slightly higher elevation than the Angie soils and are fine-loamy. Eastwood and Sacul soils have a clayey subsoil that is reddish in the upper part. These soils are on strongly sloping side slopes. Sacul soils are also in landscape positions similar to those of the Angie soils.

Typical pedon of Angie very fine sandy loam, 1 to 5 percent slopes; about 2.9 miles northeast of Bernice, 100 feet north and 1,625 feet west of the southeast corner of sec. 25, T. 22 N., R. 3 W.; USGS Bernice topographic quadrangle; latitude 32 degrees 51 minutes 55 seconds N.; longitude 92 degrees 38 minutes 07 seconds W.

Ap—0 to 4 inches; very dark grayish brown (10YR 3/2) very fine sandy loam; weak fine granular structure; very friable; common fine and few medium roots; strongly acid; abrupt smooth boundary.

E—4 to 11 inches; light yellowish brown (10YR 6/4) very fine sandy loam; common medium faint yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; very friable; few fine and medium roots; few medium and fine tubular pores; strongly acid; gradual wavy boundary.

Bt1—11 to 20 inches; strong brown (7.5YR 5/6) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few coarse and medium roots; few fine tubular pores; common distinct clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—20 to 25 inches; yellowish brown (10YR 5/6) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; moderate coarse subangular blocky structure parting to moderate fine subangular blocky; firm; few fine roots; few medium pores; common distinct clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt3—24 to 33 inches; strong brown (7.5YR 5/6) silty clay; common medium distinct grayish brown (10YR 5/2) mottles and few medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; few fine roots; common fine pores; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—33 to 41 inches; yellowish brown (10YR 5/6) silty clay; common medium distinct grayish brown (10YR 5/2) mottles and common medium prominent red (2.5YR 4/6) mottles; weak coarse subangular blocky structure; firm; few medium roots; few medium pores; common distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Btg—41 to 60 inches; gray (10YR 6/1) clay; common medium prominent yellowish brown (10YR 5/6) and red (2.5YR 5/6) mottles; weak fine subangular blocky structure; firm; few thin layers of yellowish red (5YR 5/6) loam, sandy loam and sandy clay loam below 53 inches; very strongly acid.

The solum is more than 60 inches thick. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 to 4. It is 3 to 9 inches thick. Reaction ranges from very strongly acid to slightly acid.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. Texture is very fine sandy loam, fine sandy loam, or silt loam. This horizon is 3 to 8 inches thick. Reaction ranges from very strongly acid to slightly acid.

The Bt horizon has hue of 10YR or 7.5YR and value and chroma of 4 to 6. In some pedons, the lower part of this horizon has hue of 2.5Y. Grayish mottles are few to common within a depth of 30 inches, and mottles in shades of yellow and red are common to many in the lower part of the horizon. Texture is silty clay loam, clay, silty clay, or clay loam.

Reaction ranges from extremely acid to medium acid.

The Btg horizon and the BCg horizon, if it occurs, are gray or mottled in shades of gray, brown, or red. Texture is clay loam, silty clay loam, clay, or silty clay. Reaction ranges from extremely acid to medium acid.

Betis Series

The Betis series consists of somewhat excessively drained, rapidly permeable soils that formed in thick sandy and loamy sediments. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the Betis series are sandy, siliceous, thermic Psammentic Paleudults.

Betis soils commonly are near Briley, Darley, McLaurin, and Trep soils. The Briley, McLaurin, and Trep soils are on slightly lower elevations and have a subsoil that is loamy throughout the profile. The Darley soils are on side slopes and have a clayey subsoil.

Typical pedon of Betis loamy fine sand, 1 to 5 percent slopes; about 7 miles southwest of Farmerville, 1,975 feet north and 975 feet west of the southwest corner of sec. 1, T. 20 N., R. 2 W.; USGS Cedarton topographic quadrangle; latitude 32 degrees 44 minutes 57 seconds N.; longitude 92 degrees 31 minutes 57 seconds W.

A1—0 to 7 inches; dark brown (10YR 4/3) loamy fine sand; weak fine granular structure; very friable; common fine and medium roots; medium acid; clear wavy boundary.

A2—7 to 25 inches; yellowish brown (10YR 5/4) loamy fine sand; single grained; very friable; common fine and medium roots; medium acid; gradual wavy boundary.

Bw—25 to 45 inches; strong brown (7.5YR 5/6) loamy fine sand; common medium distinct pale brown (10YR 6/3) vertical streaks; single grained; very friable; few fine and medium roots; few pockets of uncoated sand grains; medium acid; gradual wavy boundary.

Bt—45 to 60 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; some clay bridging; strongly acid; gradual wavy boundary.

Bt and E—60 to 75 inches; strong brown (7.5YR 5/6) loamy fine sand lamellae about 1 centimeter thick (Bt) and pink (7.5YR 7/3) fine sand (E); few medium faint pinkish gray (7.5YR 7/2) pockets of sand grains; weak coarse subangular blocky structure; very friable; coated sand grains and clay bridging in Bt part; strongly acid.

The thickness of the solum ranges from 60 to 80 inches. Reaction ranges from very strongly acid to medium acid throughout, except where lime has been added.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. Thickness ranges from 4 to 12 inches.

The Bw horizon has hue of 5YR, 7.5YR, or 10YR, value of 5, and chroma of 6 or 8. Spots or pockets and streaks of uncoated sand grains range from few to common.

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

The Bt part of the Bt/E horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8; or it has hue of 7.5YR or 10YR, value of 5, and chroma of 6 or 8. Texture is loamy fine sand or fine sandy loam. The E part has value of 5 to 7, and chroma of 3 or 4. Typically, a clay increase is noticeable throughout the Bt part. In some pedons, the clay accumulations occur only as lamellae. Other pedons have continuous loamy fine sand Bt horizons as opposed to lamellae.

Bienville Series

The Bienville series consists of somewhat excessively drained, moderately rapidly permeable soils that formed in sandy sediments. These soils are on low stream terraces. They are subject to rare flooding. Slopes range from 1 to 3 percent.

Soils of the Bienville series are sandy, siliceous, thermic Psammentic Paleudalfs.

The Bienville soils commonly are near Cahaba, Ochlockonee, Guyton, Iuka, and Ouachita soils. Cahaba soils are in slightly higher positions on the landscape than the Bienville soils and are fine-loamy and have a reddish subsoil. Iuka, Ochlockonee, and Ouachita soils are on flood plains and do not have an argillic horizon. Guyton soils are lower on the landscape than the Bienville soils and are fine-silty and grayish throughout the profile.

Typical pedon of Bienville loamy fine sand, 1 to 3 percent slopes; about 6 miles north of Farmerville, 800 feet west and 1,500 feet south of the northeast corner of sec. 29, T. 22 N., R. 1 E.; USGS Farmerville topographic quadrangle; latitude 32 degrees 52 minutes 10 seconds N.; longitude 92 degrees 22 minutes 57 seconds W.

A1—0 to 6 inches; dark brown (10YR 4/3) loamy fine sand; weak fine granular structure; very friable; common fine and few medium roots; very strongly acid; clear smooth boundary.

A2—6 to 12 inches; dark brown (10YR 4/3) loamy fine sand; weak medium subangular blocky structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

E—12 to 19 inches; brown (7.5YR 5/4) loamy fine sand; weak medium subangular blocky structure; very friable; few fine roots; strongly acid; clear smooth boundary.

BE—19 to 28 inches; brown (7.5YR 5/4) and pale brown (10YR 6/3) loamy fine sand; friable; few medium roots; few black organic stains on peds; strongly acid; clear wavy boundary.

Bt1—28 to 45 inches; reddish yellow (7.5YR 6/6) loamy fine sand; weak medium blocky structure; friable; few medium roots; few faint clay films on faces of some peds; strongly acid; clear wavy boundary.

Bt2—45 to 60 inches; light yellowish brown (10YR 6/4) loamy fine sand; common medium faint pale brown (10YR 6/3) mottles; weak medium blocky structure; friable; few medium roots; few faint clay films on faces of some peds; strongly acid.

The thickness of the solum ranges from 60 to 78 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The A horizon has value of 4 or 5 and chroma of 2 to 4. It is 4 to 12 inches thick. Reaction ranges from very strongly acid to slightly acid.

The E horizon and the E part of the B/E horizon have hue of 10YR or 7.5YR, value of 4 to 7, and chroma of 3 or 4. Texture is loamy fine sand or fine sand. Reaction ranges from very strongly acid to slightly acid.

The Bt horizon and the B part of the B/E horizon have hue of 7.5YR or 5YR and value and chroma of 4 to 6. Hue of 10YR is only in the lower part of the Bt horizon. Texture is fine sand or loamy fine sand in the upper part of the Bt horizon. It is fine sandy loam, loamy fine sand, or fine sand in the lower part. Reaction of the Bt horizon ranges from very strongly acid to medium acid.

Bowie Series

The Bowie series consists of moderately well drained, moderately slowly permeable soils that formed in loamy sediments. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the Bowie series are fine-loamy, siliceous, thermic Plinthic Paleudults.

Bowie soils commonly are near Kirvin, Ruston, Sacul, and Savannah soils. Kirvin and Sacul soils are at similar elevations as Bowie soils, and they have a clayey subsoil. Ruston soils are in landscape positions similar to those of the Bowie soils, and they have a reddish subsoil. Savannah soils are on ridgetops and side slopes on high terraces, and they have a fragipan.

Typical pedon of Bowie fine sandy loam, 1 to 5 percent slopes; about 6.75 miles southwest of Marion, 500 feet south and 550 feet east of the northwest corner of sec. 27, T. 22 N., R. 1 E.; USGS DeLoutre topographic quadrangle; latitude 32 degrees 52 minutes 19 seconds N.; longitude 92 degrees 21 minutes 39 seconds W.

A—0 to 4 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular block structure; very friable; many fine and few medium roots; strongly acid; clear smooth boundary.

E—4 to 14 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak medium subangular blocky structure; very friable; common fine and few medium roots; strongly acid; clear smooth boundary.

Bt1—14 to 24 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky; friable; few fine and medium roots; few fine pores; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—24 to 34 inches; strong brown (7.5YR 5/8) sandy clay loam; few fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; few fine and medium roots; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.

Btv1—34 to 49 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium prominent yellowish red (5YR 4/6) mottles and few fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm and slightly brittle in about 20 percent of layer; few fine pores; common distinct clay films on faces of peds; about 8 percent plinthite nodules; strongly acid; gradual wavy boundary.

Btv2—49 to 60 inches; yellowish brown (10YR 5/6) sandy clay loam; few fine prominent red (2.5YR 4/6) mottles and common medium distinct light brownish gray (10YR 6/2) and light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; firm and slightly brittle; few fine pores; common distinct clay films on faces of peds; about 5 percent plinthite nodules; strongly acid.

The thickness of the solum is 60 inches or more. The depth to horizons that contain more than 5 percent plinthite ranges from 25 to 50 inches. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 3 to 5 and chroma of 2 or 4. It is 2 to 8 inches thick. Reaction ranges from very strongly acid to slightly acid, unless limed.

The E horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 5. Texture is very fine sandy loam, loamy fine sand, or fine sandy loam. Reaction ranges from very strongly acid to slightly acid.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. Few to many mottles of red, yellow, or brown are in most pedons. Texture of the Bt horizon is fine sandy loam, sandy clay loam, or clay loam. Reaction is very strongly acid to strongly acid.

The Btv and Btv/E horizons have a hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Mottles in shades of red, yellow, or gray range from few to many or the matrix is mottled with these colors. The grayish mottles are at depths below 30 inches. The E materials comprise 5 to 20 percent, by volume, of the Btv/E horizons. Plinthite makes up 5 percent to about 15 percent, by volume, of these horizons. Texture is fine sandy loam, loam, clay loam, or sandy clay loam. Reaction is very strongly acid to strongly acid.

Boykin Series

The Boykin series consists of well drained soils that formed in sandy and loamy sediments. Permeability is rapid in the upper part of the soil and moderate in the lower part. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the Boykin series are loamy, siliceous, thermic Arenic Paleudults.

Boykin soils commonly are near Darley, Kirvin, Malbis, and Ruston soils. All of these soils are in landscape positions similar to those of the Boykin soils. Darley soils are also on strongly sloping to steep side slopes. Darley and Kirvin soils have a clayey or a clayey and loamy subsoil. Malbis and Ruston soils are loamy throughout the profile.

Typical pedon of Boykin loamy fine sand, 1 to 5 percent slopes; about 1.8 miles northeast of Conway, 1,990 feet south and 390 feet east of the northwest corner of sec. 9, T. 22 N., R. 1 E.; USGS Truxno topographic quadrangle; latitude 32 degrees 54 minutes 43 seconds N.; longitude 92 degrees 22 minutes 43 seconds W.

Ap—0 to 6 inches; brown (10YR 5/3) loamy fine sand; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

E—6 to 24 inches; pale brown (10YR 6/3) loamy fine sand; weak fine granular structure; very friable; common fine roots; strongly acid; clear wavy boundary.

Bt1—24 to 40 inches; yellowish red (5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—40 to 51 inches; mottled strong brown (7.5YR 5/6) and yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt3—51 to 60 inches; mottled yellowish red (5YR 5/6) and strong brown (7.5YR 5/6) sandy clay loam; common medium prominent light yellowish brown (10YR 6/4) mottles; few medium distinct red (2.5YR 4/6) mottles; weak medium subangular blocky structure; firm; common distinct clay films on faces of peds; very strongly acid.

The solum is more than 60 inches thick.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. Reaction ranges from very strongly acid to slightly acid, unless limed. Where limed, reaction ranges to mildly alkaline. This horizon is 4 to 10 inches thick.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 to 4. Reaction ranges from very strongly acid to slightly acid, unless limed. Where lime has been added, reaction ranges to neutral.

The Bt horizon has hue of 2.5YR, 5YR, or 7.5YR, value 4 or 5, and chroma of 6 or 8. Texture is fine sandy loam or sandy clay loam. Mottles are in shades of red, brown, or yellow. Reaction of the Bt horizon ranges from very strongly acid to medium acid, unless limed. Where lime has been added, reaction in the upper part of the Bt horizon can be slightly acid to neutral.

Briley Series

The Briley series consists of well drained soils that formed in sandy and loamy sediments. Permeability is rapid in the upper part of the soil and moderate in the lower part. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the Briley series are loamy, siliceous, thermic Arenic Paleudults.

Briley soils commonly are near Bowie, Darley, Mahan, McLaurin, and Ruston soils. All of these soils are in landscape positions similar to those of the Briley soils. Darley soils are also on side slopes. Bowie, Mahan, McLaurin, and Ruston soils are loamy throughout the profile. Darley soils have a clayey subsoil.

Typical pedon of Briley loamy fine sand, 1 to 5 percent slopes; about 2.5 miles northwest of Bernice, 1,750 feet south and 2,400 feet east of the northwest corner of sec. 32, T. 22 N., R. 3 W.; USGS Bernice topographic quadrangle; latitude 32 degrees 51 minutes 05 seconds N.; longitude 92 degrees 42 minutes 01 second W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) loamy fine sand; common medium distinct light yellowish brown (10YR 6/4) mottles; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

E1—4 to 10 inches; light yellowish brown (10YR 6/4) loamy fine sand; few fine distinct yellowish brown (10YR 5/6) mottles; massive; very friable; few fine and coarse roots; medium acid; clear wavy boundary.

E2—10 to 23 inches; light yellowish brown (10YR 6/4) loamy fine sand; common medium faint yellowish brown (10YR 5/4) mottles and common medium distinct yellowish red (5YR 5/6) mottles; massive; very friable; few fine and coarse roots; strongly acid; clear wavy boundary.

Bt1—23 to 35 inches; red (2.5YR 4/6) sandy clay loam; few fine prominent light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; medium acid; gradual wavy boundary.

Bt2—35 to 48 inches; yellowish red (5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; few streaks of light gray (10YR 7/2) loamy fine sand; common distinct clay films on faces of peds; medium acid; gradual wavy boundary.

Bt3—48 to 60 inches; red (2.5YR 4/8) loam; weak medium subangular blocky structure; friable; few fine roots; few streaks of light gray (10YR 7/2) loamy fine sand; few distinct clay films on faces of some peds; medium acid.

The solum is 60 inches or more thick.

The A horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. Reaction ranges from very strongly acid to slightly acid. This horizon is 4 to 14 inches thick.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 to 4. Reaction ranges from very strongly acid to slightly acid.

The Bt horizon has hue of 2.5YR, 5YR, or 7.5YR, value of 4 or 5 and chroma of 6 or 8. Texture is sandy clay loam, loam, or fine sandy loam. Mottles, when present, are in shades of red, brown, or yellow. Reaction ranges from very strongly acid to medium acid.

Cahaba Series

The Cahaba series consists of well drained, moderately permeable soils. These soils formed in loamy and sandy sediments. They are on low stream terraces. These soils are subject to rare flooding. Slopes range from 1 to 5 percent.

Soils of the Cahaba series are fine-loamy, siliceous, thermic Typic Hapludults.

Cahaba soils commonly are near the Guyton, Iuka, Ochlockonee, and Ouachita soils. The Iuka, Ochlockonee, and Ouachita soils are on flood plains and do not have a well developed subsoil. Guyton soils are lower on the landscape than the Cahaba soils and are grayish throughout the profile.

Typical pedon of Cahaba fine sandy loam, 1 to 5 percent slopes; about 2.25 miles east of Crossroads, 450 feet north and 2,950 feet west of the southeast corner of sec. 17, T. 20 N., R. 3 E.; USGS Rocky Branch topographic quadrangle; latitude 32 degrees 42 minutes 51 seconds N.; longitude 92 degrees 11 minutes 02 seconds W.

A—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; moderate medium granular structure; very friable; common fine roots; very strongly acid; abrupt smooth boundary.

A/B—4 to 10 inches; dark brown (10YR 4/3) fine sandy loam (A) and strong brown (7.5YR 5/6) fine sandy loam (Bt); weak medium subangular blocky structure; very friable; medium acid; clear smooth boundary.

Bt1—10 to 19 inches; yellowish red (5YR 4/6) loam; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—19 to 30 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; many distinct clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt3—30 to 37 inches; red (2.5YR 4/6) loam; weak medium subangular blocky structure; friable; many distinct clay films on faces of peds; medium acid; gradual smooth boundary.

C1—37 to 45 inches; yellowish red (5YR 4/8) fine sandy loam; massive; very friable; medium acid; gradual smooth boundary.

C2—45 to 57 inches; yellowish red (5YR 4/8) loamy fine sand; few fine prominent light brown (7.5YR 6/4) mottles; massive; very friable; medium acid; gradual smooth boundary.

C3—57 to 68 inches; light brown (7.5YR 6/4) fine sand; few fine distinct strong brown (7.5YR 5/6) mottles; massive; medium acid; loose; gradual smooth boundary.

The thickness of the solum ranges from 36 to 60 inches. Reaction ranges from very strongly acid to medium acid. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The A horizon has value of 3 to 5 and chroma of 2 to 4. Thickness ranges from 4 to 8 inches.

The A part of the A/B horizon has the same color and texture as the A horizon. The Bt part has hue of 7.5YR or 5YR, value of 5 or 6, and chroma of 6 or 8. Texture is fine sandy loam or loam.

Some pedons have an E horizon. Where present, it has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. Texture is fine sandy loam or loamy fine sand.

The Bt horizon has value of 4 or 5 and chroma of 6 or 8. Texture is sandy clay loam, clay loam, or loam.

Some pedons have a BC horizon. Where present, it has colors similar to those of the Bt horizon. In some pedons, this horizon is mottled with shades of yellow and brown. Texture is fine sandy loam or sandy loam.

The C horizon has hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 4 to 8. It is commonly stratified with layers of fine sand, loamy fine sand, and fine sandy loam.

Darley Series

The Darley series consists of well drained, moderately slowly permeable soils that contain layers of fractured ironstone. These soils formed in iron-rich, loamy and clayey sediments. They are on uplands. Slopes range from 1 to 30 percent.

Soils of the Darley series are clayey, kaolinitic, thermic Typic Hapludults.

Darley soils commonly are near Mahan, Ruston, and Sacul soils. All of these soils are in landscape positions similar to those of the Darley soils on ridgetops and side slopes. Mahan, Ruston, and Sacul soils do not have ironstone layers in the subsoil. Also, Ruston soils are loamy throughout the profile.

Typical pedon of Darley gravelly fine sandy loam, 1 to 5 percent slopes; about 4.5 miles North of Downsville, 225 feet north and 1,425 feet west of the southeast corner of sec. 19, T. 20 N., R. 1 E.; USGS Downsville North topographic quadrangle; latitude 32 degrees 41 minutes 58 seconds N.; longitude 92 degrees 24 minutes 07 seconds W.

A—0 to 7 inches; dark brown (7.5YR 4/4) gravelly fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; about 15 percent, by volume, angular fragments of ironstone that range from 1/8 inch to 1 1/2 inches in diameter; very strongly acid; clear smooth boundary.

E—7 to 13 inches; yellowish red (5YR 5/6) gravelly fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; about 15 percent, by volume, angular ironstone fragments that range in diameter from 1/8 inch to 1/2 inch; strongly acid; clear wavy boundary.

Bt1—13 to 29 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable; few fine roots; about 10 percent, by volume, angular fragments of ironstone that range in diameter from 1/8 inch to 1 inch; few distinct clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—29 to 45 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds; common pockets of strong brown (7.5YR 5/6) and gray (10YR 6/1) materials; about 5 percent small angular fragments of ironstone; very strongly acid; abrupt smooth boundary.

Bt/Bsm—45 to 60 inches; alternating layers of red (2.5YR 4/6) and strong brown (7.5YR 5/6) sandy clay (Bt) and nearly continuous layers of fractured ironstone (Bsm); the Bt part has weak medium subangular blocky structure and is friable; the Bsm part consists of ironstone layers separated by clay loam material; few faint clay films on faces of peds; many small pockets of gray (10YR 6/1) clay loam are embedded within the Bt material; very strongly acid.

The thickness of the solum exceeds 60 inches. The depth to ironstone layers typically ranges from 20 to 45 inches and can range from 10 to 45 inches. Angular and flattened fragments of ironstone make up from 15 to 35 percent of the volume in the A and E horizons. Thickness of ironstone layers ranges from 1/2 inch to 10 inches. The lateral distance between fractures in the ironstone ranges from 2 to 20 inches and averages from 4 to 48 inches. The average content of clay in the textural control section ranges from 40 to 60 percent. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 3 to 8. Reaction ranges from very strongly acid to slightly acid. Thickness ranges from 2 to 8 inches.

The E horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 to 8. It is gravelly fine sandy loam, gravelly sandy loam, gravelly loamy fine sand, or gravelly loamy sand. Reaction ranges from very strongly acid to slightly acid.

The upper part of the Bt horizon above the ironstone layers has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 3 to 8. It is sandy clay loam, clay loam, or sandy clay. The content of clay ranges from 35 to 60 percent. Fragments of ironstone make up from less than 1 percent to 15 percent of volume. Reaction is very strongly acid to strongly acid.

The Bt/Bsm horizon consists of alternating layers of ironstone and sandy clay or clay or their gravelly counterparts. Ironstone fragments, including fragments that make up the ironstone layers, make up from 20 to 60 percent of the volume of the horizon. The ironstone layers are fractured and range in thickness from 1/2 inch to 10 inches. The lateral distance between fractures ranges from 2 to 20 inches and averages 4 to 8 inches. Typically, the ironstone layers are continuous for several feet; but in some pedons they are intermittent and extend only a few feet horizontally. The less than 2 millimeter fraction has hue of 5YR, 2.5YR, or 7.5YR, value of 3 to 5, and chroma of 4 to 8. Few to many small pockets and strata of whitish or grayish kaolin are in some pedons. Pockets and strata of loamy and sandy material range from none to common. Reaction is very strongly acid to strongly acid.

Eastwood Series

The Eastwood series consists of moderately well drained, very slowly permeable soils that formed in clayey and loamy sediments. These soils are on uplands. Slopes range from 5 to 12 percent.

Soils of the Eastwood series are fine, montmorillonitic, thermic Vertic Hapludalfs.

Eastwood soils commonly are near Angie, Bowie, Darley, and Mahan soils. Angie soils are on broad, gently sloping ridgetops and have a base saturation of less than 35 percent. Bowie soils are on convex ridgetops at a higher elevation and are fine-loamy. Darley and Mahan soils are at a higher elevation than the Eastwood soils. Darley soils have layers and fragments of ironstone. Mahan soils have a base saturation of less than 35 percent.

Typical pedon of Eastwood very fine sandy loam, 5 to 12 percent slopes; about 3.5 miles northeast of Shiloh, 2,450 feet west and 300 feet south of the northeast corner of sec. 13, T. 21 N., R. 2 W.; USGS Shiloh topographic quadrangle; latitude 32 degrees, 48 minutes, 59 seconds N.; longitude 92 degrees, 32 minutes, and 03 seconds W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; less than 5 percent, by volume, of angular fragments of ironstone that range from 0.12 inch to 1 inch in diameter; strongly acid; clear wavy boundary.

E—5 to 9 inches; brown (7.5YR 5/4) very fine sandy loam; moderate medium subangular blocky structure; very friable; few fine roots; less than 5 percent, by volume, angular fragments of ironstone that range in diameter from 0.12 inch to 1 inch; strongly acid; clear wavy boundary.

Bt1—9 to 24 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; very firm, few fine roots; common distinct clay films on faces of peds; less than 5 percent, by volume, angular fragments of ironstone that range in diameter from 0.12 inch to 1 inch; strongly acid; gradual wavy boundary.

Bt2—24 to 36 inches; red (2.5YR 4/8) clay; common medium prominent light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm, few fine roots; common faint clay films on faces of peds; few fine pressure faces; strongly acid; gradual wavy boundary.

Bt3—36 to 43 inches; red (2.5YR 4/6) silty clay; common medium prominent light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure parting to weak medium platy; firm, slightly plastic; few fine roots; few faint clay films on faces of peds; few intersecting slickensides; strongly acid; gradual wavy boundary.

BC—43 to 60 inches; red (2.5YR 4/8) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure parting to weak medium platy; firm, slightly plastic; few faint clay films on faces of peds; strongly acid; abrupt smooth boundary.

C—60 to 65 inches; mottled brown (7.5YR 4/2) and light brownish gray (10YR 6/2) weakly consolidated materials of silty clay loam; common fine distinct yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) mottles; moderate medium and coarse platy structure; friable; medium acid.

The solum is 40 to 60 inches thick. The soil cracks when dry. Cracks are 0.5 inch or more wide at a depth of about 20 inches and are at least 12 inches long. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. Reaction ranges from very strongly acid to medium acid. This horizon is 2 to 6 inches thick.

The E horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 6. Texture is fine sandy loam, very fine sandy loam, or loam. Reaction ranges from very strongly acid to medium acid.

The upper part of the Bt horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 6 or 8. Mottles are in shades of brown and gray and range from none to common. The lower part of the Bt horizon is mottled or it has matrix colors in shades of red, brown, or gray. Mottles of these colors and mottles in shades of yellow range from few to many. Texture is silty clay or clay in the upper part of the Bt horizon and clay, silty clay, clay loam, or silty clay loam in the lower part. Reaction ranges from extremely acid to strongly acid throughout the Bt horizon.

The BC horizon is mottled in shades of brown or gray, or it has dominant colors of red, brown, or gray with mottles of these colors and with or without reddish or yellowish mottles. Texture is loam, sandy clay loam, clay loam, or silty clay loam. Some pedons contain few to common white masses of barite. Reaction ranges from extremely acid to slightly acid.

The C horizon has dominant colors in shades of brown or gray with mottles and/or strata of these colors and with or without yellowish colors. It is weakly consolidated, and texture ranges from fine sandy loam to silty clay loam. Most pedons contain a few masses of white barite salts. The reaction ranges from very strongly acid to neutral.

Frizzell Series

The Frizzell series consists of somewhat poorly drained, slowly permeable soils. These soils formed in mixed loess and loamy sediments. They are on low terraces. Slopes range from 0 to 2 percent.

Soils of the Frizzell series are coarse-silty, siliceous, thermic Glossaquic Hapludalfs.

Frizzell soils commonly are near the Guyton, Libuse, and Savannah soils. The Guyton soils are lower on the landscape than the Frizzell soils and are gray throughout the profile. The Libuse and Savannah soils are in higher positions. These soils are more sloping than the Frizzell soils and have a fragipan.

Typical pedon of Frizzell silt loam; 4 miles southeast of Haile, 1,900 feet south and 600 feet west of the northeast corner of sec. 26, T. 21 N., R. 3 E.; USGS Harrell Lake topographic quadrangle; latitude 32 degrees 46 minutes 50 seconds N.; longitude 92 degrees 07 minutes 25 seconds W.

Ap—0 to 4 inches; dark brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; many fine roots; few fine pores; slightly acid; gradual smooth boundary.

B/E—4 to 24 inches, yellowish brown (10YR 5/4) silt loam (Bt); common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine roots; common fine and very fine pores; interfingers of light brownish gray (10YR 6/2) silt loam E material 0.5 inch wide extend through this horizon; common fine black concretions; very strongly acid; gradual wavy boundary.

Bt1—24 to 36 inches, yellowish brown (10YR 5/6) silt loam; common medium distinct yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine black concretions; common faint clay films on faces of peds; strongly acid; abrupt wavy boundary.

Bt2—36 to 45 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3—45 to 60 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct dark yellowish brown (10YR 4/4) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable with a few slightly brittle bodies; few faint clay films on faces of peds; strongly acid.

The thickness of the solum ranges from 60 to 80 inches. This soil is very strongly acid to medium acid throughout, except where the surface has been limed. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. Thickness ranges from 1 to 4 inches.

The Bt part of the B/E horizon has value of 5 or 6 and chroma of 3 to 6. It is silt loam or loam. Common to many mottles are in shades of gray or brown.

The E part of the B/E horizon consists of streaks or spots of interfingers of less clayey material. It has value of 5 to 7 and chroma of 1 to 3.

The Bt horizon has value of 4 to 6 and chroma of 3 to 6. Texture is silty clay loam, silt loam, loam, or clay loam.

Groom Series

The Groom series consists of poorly drained, moderately slowly permeable soils. These soils formed in mixed loess or loamy sediments. They are on low stream terraces. These soils are subject to occasional or frequent flooding. Slopes are less than 1 percent.

Soils of the Groom series are fine-silty, siliceous, thermic, Aeric Ochraqualfs.

The Groom soils commonly are near the Guyton, Haggerty, Litro, Perry, Portland, and Wrightsville soils. The Guyton soils are in local drainageways and are gray throughout the profile. The Haggerty and Wrightsville soils are in landscape positions similar to those of the Groom soils. Haggerty soils are coarse-loamy. The Wrightsville soils have a fine textured control section. Litro, Perry, and Portland soils are in lower positions and have a clayey subsoil.

Typical pedon of Groom silt loam, occasionally flooded; about 6.4 miles northeast of Marion, 800 feet south and 1,200 feet east of the northwest corner of sec. 2, T. 22 N., R. 3 E.; USGS Marion East topographic quadrangle; latitude 32 degrees 55 minutes 43 seconds N.; longitude 22 degrees 08 minutes 05 seconds W.

A—0 to 3 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable; few fine and very fine roots; very strongly acid; abrupt smooth boundary.

BAg—3 to 11 inches; grayish brown (10YR 5/2) silt loam; many fine distinct dark yellowish brown (10YR 4/4, 4/6) mottles; moderate medium subangular blocky structure; friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

Btg1—11 to 21 inches; gray (10YR 6/1) silty clay loam; many medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—21 to 33 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—33 to 48 inches; grayish brown (2.5Y 5/2) silty clay loam; few medium distinct light yellowish brown (2.5Y 6/4) mottles; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; extremely acid; gradual wavy boundary.

Btg4—48 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; common coarse distinct light yellowish brown (2.5Y 6/4) mottles; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; few pockets of white calcium sulfate; medium acid; gradual wavy boundary.

The thickness of the solum ranges from 60 to 90 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 4 to 6 and chroma of 2 or 3. Thickness ranges from 3 to 8 inches. Reaction ranges from extremely acid to strongly acid. Texture is silt loam or silty clay loam.

The BAg horizon has value of 5 or 6 and chroma of 1 or 2. Mottles in shades of brown range from few to many. Texture is silt loam, loam, or very fine sandy loam. Reaction ranges from extremely acid to strongly acid.

The Btg horizon has mottles in shades of brown and yellow that range from few to many. Texture is silty clay loam, silt loam, or loam. Reaction ranges from extremely acid to medium acid.

Guyton Series

The Guyton series consists of poorly drained, slowly permeable soils that formed in loamy sediments. These soils are on flood plains and on low and high terraces. The soils on flood plains are frequently flooded. Slopes are 0 to 1 percent.

Soils of the Guyton series are fine-silty, siliceous, thermic Typic Glossaqualfs.

Guyton soils commonly are near the Cahaba, Frizzell, Iuka, Libuse, Ochlockonee, Ouachita, and Savannah soils. The Cahaba, Frizzell, Libuse, and Savannah soils are on terraces. They are higher on the landscape than the Guyton soils. The Cahaba and Savannah soils are fine-loamy. The Frizzell soils are coarse-silty. The Libuse and Savannah soils have a fragipan. The Iuka, Ochlockonee, and Ouachita soils are on flood plains and do not have a well developed subsoil.

Typical pedon of Guyton silt loam; about 0.75 mile northwest of Sterlington, 2,550 feet south and 2,600 feet west of the northeast corner of sec. 19, T. 20 N., R. 4 E.; USGS Sterlington topographic quadrangle; latitude 32 degrees 42 minutes 20 seconds N.; longitude 92 degrees 05 minutes 46 seconds W.

A—0 to 4 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; many medium roots; extremely acid; clear smooth boundary.

Eg1—4 to 12 inches; light gray (10YR 7/2) silt loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; many medium roots; few fine black concretions; extremely acid; clear smooth boundary.

Eg2—12 to 19 inches; light gray (10YR 7/2) silt loam; common medium distinct dark brown (7.5YR 4/4) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; many medium roots; few fine black concretions; very strongly acid; clear smooth boundary.

B/E—19 to 28 inches; grayish brown (10YR 5/2) silty clay loam (Bt) and light gray (10YR 7/1) silt loam (E); few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; few fine black concretions; very strongly acid; clear wavy boundary.

Btg1—28 to 40 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm; common fine pores; few faint clay films on faces of peds; few vertical streaks of light gray (10YR 7/1) silt loam; very strongly acid; clear smooth boundary.

Btg2—40 to 52 inches; light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; friable; common fine pores; few faint clay films on faces of peds; extremely acid; clear smooth boundary.

Btg3—52 to 60 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable; common fine pores; few faint clay films on faces of peds; extremely acid.

The thickness of the solum ranges from 50 to 80 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity. Exchangeable sodium may be from 5 to more than 15 percent in the lower part of the solum.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 or 3. It is 3 to 8 inches thick. Reaction ranges from extremely acid to medium acid, except where limed.

Thickness ranges from 4 to 8 inches.

The Eg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of brown range from few to many. Texture is silt loam, loam, or very fine sandy loam. Reaction ranges from extremely acid to medium acid.

The Bt part of the B/E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is silty clay loam or silt loam with few to common mottles in shades of brown and gray. It is extremely acid to medium acid.

The E part of the B/E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is silt loam or very fine sandy loam and contains less clay than the Bt part of the B/E horizon. Reaction ranges from extremely acid to medium acid.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is silty clay loam, silt loam, or clay loam. Reaction ranges from extremely acid to medium acid.

Haggerty Series

The Haggerty series consists of somewhat poorly drained, moderately rapidly permeable soils that formed in loamy and sandy sediments. These soils are on low stream terraces that are former beaches of relict lakes. They are frequently flooded. Slopes are less than 1 percent.

Soils of the Haggerty series are coarse-loamy, siliceous, thermic Aeric Ochraquults.

Haggerty soils commonly are near the Groom, Litro, and Perry soils. The Groom soils are in landscape positions similar to those of the Haggerty soils and are fine-silty. The Litro and Perry soils are in lower positions and are clayey throughout the profile.

Typical pedon of Haggerty silty clay loam, frequently flooded; about 2.5 miles northeast of Dean, 2,600 feet south and 50 feet west of the northeast corner of sec. 34, T. 23 N., R. 3 E.; USGS Marion East topographic quadrangle; latitude 32 degrees 56 minutes 16 seconds N.; longitude 92 degrees 08 minutes 20 seconds W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) silty clay loam; common medium distinct brown (7.5YR 4/4) mottles; weak medium granular structure; very friable; common fine roots; few fine pores; extremely acid; clear smooth boundary.

Bt1—7 to 14 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; very friable; common fine and medium roots; few fine pores; sand grains coated and bridged with clay; extremely acid; clear wavy boundary.

Bt2—14 to 26 inches; pale brown (10YR 6/3) fine sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; many fine and medium roots; common fine pores; few faint clay films and common clay bridges between sand grains; very strongly acid; clear wavy boundary.

BC—26 to 37 inches; light gray (10YR 7/2) loamy fine sand; few medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; very friable; few very fine and fine roots; few very fine and fine pores; clay bridges between sand grains; very strongly acid; clear wavy boundary.

C—37 to 60 inches; light gray (10YR 7/1) sand; few fine faint pale brown mottles and few fine distinct yellowish brown (10YR 5/4) mottles; single-grained; loose; very strongly acid.

The thickness of the solum ranges from 25 to 55 inches. Reaction ranges from extremely acid to strongly acid throughout, except where the soil has been limed. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity. The content of gravel ranges from 0 to 5 percent in the lower part of the Bt horizon and in the C horizon.

The A horizon has value of 3 to 6, and chroma of 2 to 4. Where the value is 3, the thickness is 6 inches or less. Texture is fine sandy loam or silty clay loam. Thickness ranges from 4 to 10 inches.

The upper part of the Bt horizon has value of 5 or 6, and chroma of 1 or 2. Mottles are in shades of gray, brown, or red. Texture is fine sandy loam or loamy fine sand with less than 18 percent clay. The lower part of the Bt horizon has value of 4 to 6 and chroma of 1 to 6. Texture is fine sandy loam or loamy fine sand.

The BC horizon has value of 6 or 7 and chroma of 1 or 2. It has the same texture as the Bt horizon. Mottles are in shades of brown or red.

The C horizon has value of 6 to 8 and chroma of 1 or 2. Texture is sand, fine sand, or loamy fine sand.

Harleston Series

The Harleston series consists of moderately well drained, moderately permeable soils that formed in loamy sediments. These soils are on low stream terraces. They are subject to rare flooding. Slopes range from 1 to 3 percent.

Soils of the Harleston series are coarse-loamy, siliceous, thermic Aquic Paleudults.

The Harleston soils commonly are near Cahaba, Guyton, Iuka, Ochlockonee, and Ouachita soils. Cahaba soils are in slightly higher positions on the landscape than the Harleston soils and are fine-loamy. Iuka, Ochlockonee, and Ouachita soils are on flood plains and do not have a well developed subsoil. Guyton soils are lower on the landscape than the Harleston soils and are fine-silty and grayish throughout the profile. Guyton soils also are on flood plains.

Typical pedon of Harleston fine sandy loam, 1 to 3 percent slopes; about 4.1 miles southeast of Mt. Union, 800 feet north and 1,600 feet west of the southeast corner of sec. 18, T. 22 N., R. 1 W.; USGS Spearsville topographic quadrangle; latitude 32 degrees 53 minutes 29 seconds N.; longitude 92 degrees 30 minutes 23 seconds W.

A—0 to 2 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure; very friable; common fine and few medium roots; strongly acid; clear smooth boundary.

E—2 to 10 inches; pale brown (10YR 6/3) fine sandy loam; common medium faint brown (10YR 5/3) mottles, weak medium platy structure; very friable; few fine roots; strongly acid; clear smooth boundary.

BE—10 to 17 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; strongly acid; clear smooth boundary.

Bt1—17 to 29 inches; yellowish brown (10YR 5/4) sandy loam; common medium faint brown (10YR 5/3) mottles and few medium faint yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; very friable; few medium roots; few medium tubular pores; few faint clay films on faces of some peds; few fine and medium concretions; few silt coatings of light yellowish brown (10YR 6/4); strongly acid; clear wavy boundary.

Bt2—29 to 37 inches; yellowish brown (10YR 5/6) sandy loam; few fine distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; slightly brittle; few medium roots; few fine tubular pores; few faint clay films on faces of some peds; few silt coatings of pale brown (10YR 6/3); strongly acid; clear wavy boundary.

Bt3—37 to 43 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; slightly brittle; few faint clay films on faces of some peds; few nodules of plinthite; very strongly acid; clear wavy boundary.

Bt4—43 to 52 inches; mottled yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), and light brownish gray (10YR 6/2) sandy clay loam; moderate medium subangular blocky structure; firm; slightly brittle; few fine tubular pores; few faint clay films on faces of some peds; very strongly acid.

Bt5—52 to 60 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; firm; slightly brittle in yellowish brown part; few faint clay films on faces of some peds; very strongly acid.

The solum is more than 60 inches thick. Reaction ranges from extremely acid to strongly acid throughout the solum. The content of gravel ranges from none to as much as 10 percent of the volume in all horizons. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The A horizon has value of 3 to 5 and chroma of 1 to 3. It is 2 to 5 inches thick.

The E horizon has value of 4 to 6 and chroma of 2 to 4. Texture is loam, loamy fine sand, fine sandy loam, or sandy loam. This horizon is 3 to 10 inches thick.

The BE horizon has chroma of 4 to 6. Texture is fine sandy loam or loam.

The upper part of the Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Mottles in shades of brown or red range from few to many. Also, mottles that have chroma of 2 or less are within 30 inches of the surface and range from few to many in the Bt horizon. Texture is sandy loam or loam.

The lower part of the Bt horizon has matrix colors similar to those of the upper part, or it is mottled in shades of gray, brown, or red. Texture is sandy loam, loam, or sandy clay loam. Some pedons have 1 to 5 percent plinthite. Some pedons have few to many, fine to medium concretions of iron.

Hebert Series

The Hebert series consists of somewhat poorly drained, moderately slowly permeable soils that formed in loamy alluvium deposited by the old Arkansas River. These soils are on flood plains. They are subject to occasional or frequent flooding. Slopes are less than 1 percent.

Soils of the Hebert series are fine-silty, mixed, thermic Aeric Ochraqualfs.

Hebert soils commonly are near the Groom, Perry, Portland, and Sterlington soils. The Groom soils are on low stream terraces and are poorly drained and grayish throughout the profile. The Perry and Portland soils are lower on the landscape than the Hebert soils and have a clayey subsoil. The Sterlington soils are in higher positions and are coarse-silty.

Typical pedon of Hebert silt loam, occasionally flooded; about 0.5 mile southwest of Sterlington, 2,275 feet south and 3,175 feet east of the northwest corner of sec. 30, T. 20 N., R. 4 E.; USGS Sterlington topographic quadrangle; latitude 32 degrees 41 minutes 32 seconds N.; longitude 92 degrees 05 minutes 41 seconds W.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; very friable; few fine pores; few fine black stains on peds; medium acid; clear smooth boundary.

E—6 to 10 inches; brown (10YR 5/3) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium platy structure; very friable; common fine pores; few medium roots; few fine and very fine black concretions; medium acid; clear smooth boundary.

Bt1—10 to 20 inches; brown (10YR 5/3) silty clay loam; grayish brown (10YR 5/2) on faces of peds; common medium faint light brownish gray (10YR 6/2) mottles and common medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; friable; few medium roots; common fine pores; few distinct clay films on faces of peds; common fine to coarse black concretions; few thin silt coatings on faces of peds; strongly acid; clear smooth boundary.

Bt2—20 to 30 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine and medium roots; common fine pores; few distinct clay films on faces of peds; few fine and medium black concretions; common thin silt coatings on faces of peds; strongly acid; clear wavy boundary.

Bt3—30 to 37 inches; brown (7.5YR 4/4) silty clay loam; common medium distinct brown (10YR 5/3) mottles and few fine distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; few fine and medium roots; few fine and medium pores; few distinct clay films on faces of peds; few fine and medium black concretions; thick light brownish gray (10YR 6/2) silt coatings on faces of peds; medium acid; clear wavy boundary.

BC—37 to 45 inches; reddish brown (5YR 4/4) silty clay loam; common medium distinct dark brown (7.5YR 4/4) mottles and few medium prominent grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; firm; few fine and medium roots; few fine pores; few distinct clay films on faces of peds; few very fine black concretions; slightly acid; clear smooth boundary.

CB—45 to 60 inches; reddish brown (5YR 4/3) silty clay loam; common medium prominent grayish brown (10YR 5/2) mottles; massive; firm; few very fine roots; few soft black masses; mildly alkaline.

The thickness of the solum ranges from 36 to 72 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 10 to 20 percent of the effective cation-exchange capacity.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. Texture is silt loam or silty clay loam. Reaction ranges from very strongly acid to neutral. Thickness ranges from 4 to 10 inches.

The E horizon has value of 5 to 7 and chroma of 1 to 3. Texture is silt loam, loam, or very fine sandy loam. Reaction ranges from very strongly acid to slightly acid.

The Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 to 6, and chroma of 2 to 4. Texture is silt loam, silty clay loam, or loam. Reaction ranges from very strongly acid to slightly acid.

The BC, CB, and C horizons have the same colors as the Bt horizon. Texture is silt loam, silty clay loam, or very fine sandy loam. Reaction ranges from strongly acid to mildly alkaline.

Iuka Series

The Iuka series consists of moderately well drained, moderately permeable soils that formed in loamy and sandy alluvium. These soils are on flood plains. They are frequently flooded. Slopes are less than 1 percent.

Soils of the Iuka series are coarse-loamy, siliceous, acid, thermic Aquic Udifluvents.

Iuka soils commonly are near Guyton, Ochlockonee, and Ouachita soils. Ochlockonee and Ouachita soils are higher on the landscape than the Iuka soils and do not have mottles of 2 chroma or less within 20 inches of the surface. Guyton soils are in lower positions and are fine-silty and grayish throughout the profile.

Typical pedon of Iuka fine sandy loam, in an area of Iuka-Ochlockonee complex, frequently flooded; about 2.75 miles southeast of Laran, 1,725 feet north and 1,400 feet west of the southeast corner of sec. 33, T. 23 N., R. 1 W.; USGS Truxno topographic quadrangle; latitude 32 degrees 56 minutes 11 seconds N.; longitude 92 degrees 28 minutes 14 seconds W.

A—0 to 6 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; common medium and fine roots; common medium tubular pores; strongly acid; clear smooth boundary.

C1—6 to 15 inches; brown (10YR 5/3) fine sandy loam; few fine faint light brownish gray mottles; weak fine granular structure; friable; common fine and medium roots; many medium irregular pores; very strongly acid; clear smooth boundary.

C2—15 to 23 inches; yellowish brown (10YR 5/4) loam; common medium distinct light brownish gray (10YR 6/2) mottles; massive; friable; common fine and few medium roots; common fine black specks; very strongly acid; clear smooth boundary.

Cg1—23 to 30 inches; mottled light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6, 5/4) fine sandy loam; massive; friable; few fine roots; common medium irregular pores; extremely acid; clear wavy boundary.

Cg2—30 to 40 inches; light brownish gray (10YR 6/2) loamy fine sand; common medium distinct yellowish brown (10YR 5/6) mottles; massive; very friable; few fine roots; common medium irregular pores; extremely acid; gradual wavy boundary.

Cg3—40 to 60 inches; light gray (10YR 7/2) loamy fine sand; common medium distinct light yellowish brown (10YR 6/4) mottles; massive; very friable; extremely acid.

Thin bedding planes of contrasting textures are in some pedons. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 to 4. Reaction is very strongly acid to strongly acid. Thickness ranges from 1 to 8 inches.

The C horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 6, and chroma of 3 to 6; or it has hue of 10YR or 7.5YR, value of 4, and chroma of 2. Mottles that have chroma of 2 or less are within 20 inches of the surface. Texture is sandy loam, fine sandy loam, loam, or silt loam. Reaction ranges from extremely acid to strongly acid.

The Cg horizon has value of 5 to 7 and chroma of 1 or 2, or it is mottled in shades of gray, brown, or red. Texture is sandy loam, fine sandy loam, loam, silt loam, or loamy fine sand. Some pedons have thin sandy strata, or they have texture of sandy clay loam or clay loam at a depth of more than 40 inches. Some pedons have buried A horizons below a depth of 20 inches. Reaction ranges from extremely acid to strongly acid.

Kirvin Series

The Kirvin series consists of well drained, moderately slowly permeable soils that formed in loamy and clayey sediments. These soils are on uplands. Slopes range from 1 to 12 percent.

Soils of the Kirvin series are clayey, mixed, thermic Typic Hapludults.

Kirvin soils commonly are near Malbis, Sacul, and Sawyer soils. All of these soils are in landscape positions similar to those of the Kirvin soils. Malbis soils are fine-loamy and have a brownish subsoil. Sacul soils have gray mottles in the upper part of the subsoil. Sawyer soils are fine-silty.

Typical pedon of the Kirvin fine sandy loam, 1 to 5 percent slopes; about 6 miles northwest of Marion, 300 feet east and 1,500 feet south of the northwest corner of sec. 18, T. 23 N., R. 2 E.; USGS Marion West topographic quadrangle; latitude 33 degrees 59 minutes 06 seconds N.; longitude 92 degrees 18 minutes 34 seconds W.

A—0 to 5 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

Bt1—5 to 16 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm; common fine and medium roots; few faint clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—16 to 24 inches; red (2.5YR 4/6) clay; few fine distinct yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; few distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt3—24 to 36 inches; red (2.5YR 4/8) sandy clay; moderate medium subangular blocky structure; firm; many medium prominent strong brown (7.5YR 5/6) mottles; common distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

BC—36 to 50 inches; red (2.5YR 4/8) sandy clay loam; many medium prominent strong brown (7.5YR 5/6) mottles and few medium prominent light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few distinct clay films on faces of peds; few small bodies of white (10YR 8/1) kaolin clay; very strongly acid.

C—50 to 60 inches; red (2.5YR 4/6) sandy clay loam; common medium prominent strong brown (7.5YR 5/6) mottles and few medium prominent light brownish gray (10YR 6/2) mottles; massive; friable; few small bodies of white (10YR 6/2) kaolin clay; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The particle-size control section is 40 to 60 percent clay. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. Some pedons have hue of 5YR, value of 4 or 5, and chroma of 5 or 6. Reaction ranges from strongly acid to neutral. Thickness of the A horizon ranges from 3 to 6 inches.

The E horizon, if it occurs, has values of 1 or 2 units greater than the A horizon. Texture is fine sandy loam or very fine sandy loam. Reaction is strongly acid to medium acid. Thickness ranges from 3 to 8 inches.

The Bt horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 4 to 8. Mottles are in shades of yellow or brown. Grayish platy shale fragments or mottles are in the lower part of some pedons. Texture is clay, sandy clay, or clay loam. Some pedons have ironstone fragments in the Bt horizon. Reaction ranges from extremely acid to strongly acid.

The BC horizon has reddish, yellowish, or brownish colors and is generally mottled with these or grayish colors. Thin strata and fragments of sandstone or shaly materials range from none to common. Texture is sandy clay loam, clay loam, or clay. Reaction is extremely acid to very strongly acid.

The C horizon is reddish, yellowish, or brownish sandy clay loam, sandy loam, or clay loam. Mottles are in shades of brown, yellow, or gray. Bodies of shaly material or kaolin are in some pedons. Reaction is extremely acid to very strongly acid.

Libuse Series

The Libuse series consists of moderately well drained, slowly permeable soils that have a fragipan. These soils formed in mixed loess and loamy sediments. They are on high terraces. Slopes range from 1 to 8 percent.

Soils of the Libuse series are fine-silty, siliceous, thermic Typic Fragiudalfs.

Libuse soils commonly are near the Frizzell, Guyton, Ora, and Savannah soils. The Frizzell soils are nearly level, coarse-silty, and do not have a fragipan. The poorly drained Guyton soils are on terraces and on narrow flood plains. They are poorly drained and gray throughout the profile. The Ora and Savannah soils are in similar positions on the landscape as the Libuse soils. They are fine-loamy.

Typical pedon of Libuse silt loam, 1 to 5 percent slopes; about 4 miles north of Sterlington, 1,500 feet south and 100 feet east of the northwest corner of sec. 6, T. 20 N., R. 4 E.; USGS Harrell Lake topographic quadrangle; latitude 32 degrees 45 minutes 08 seconds N.; longitude 92 degrees 06 minutes 18 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; few fine roots; very strongly acid; clear smooth boundary.

BA—3 to 11 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine roots; very strongly acid; clear smooth boundary.

Bt—11 to 26 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; few fine roots; very strongly acid; clear wavy boundary.

Btx1—26 to 45 inches; yellowish brown (10YR 5/6) silt loam; few medium distinct strong brown (7.5YR 4/6) mottles; moderate very coarse prismatic structure; firm and brittle; seams of pale brown (10YR 6/3) silt loam between prisms; common fine pores; common distinct clay films on faces of peds; few coarse black concretions; strongly acid; gradual wavy boundary.

Btx2—45 to 60 inches; yellowish brown (10YR 5/6) silt loam; few medium distinct strong brown (7.5YR 5/6) mottles; moderate very coarse prismatic structure; firm and brittle; seams of light brownish gray (10YR 6/2) silt loam between prisms; common fine pores; few distinct clay films on faces of peds; few medium black concretions; medium acid.

The thickness of the solum ranges from 60 to 90 inches. Depth to the fragipan ranges from 18 to 36 inches. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 3 to 5 and chroma of 1 to 3. Reaction ranges from very strongly acid to slightly acid. Thickness ranges from 3 to 8 inches.

The BA horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 8. Texture is silt loam or loam. Reaction ranges from very strongly acid to medium acid.

The Bt horizon above the fragipan has the same colors as the BA horizon. Texture is silt loam, loam, or silty clay loam. Reaction ranges from very strongly acid to medium acid. Red mottles are in some pedons.

The Btx horizon has colors, textures, and reaction similar to the Bt horizon. It is mottled in shades of gray, yellow, brown, or red. Typically, the sand content is greater in the fragipan than in the Bt horizon.

The BC horizon, if it occurs, has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. Texture is silt loam, loam, or sandy clay loam. Reaction ranges from very strongly acid to medium acid.

Litro Series

The Litro series consists of poorly drained, very slowly permeable soils that formed in clayey alluvium. They are on flood plains. Slopes are dominantly less than 1 percent, but range from 0 to 2 percent.

Soils of the Litro series are fine, mixed, acid thermic Vertic Haplaquepts.

The Litro soils commonly are near Groom, Haggerty, and Perry soils. The Groom and Haggerty soils are slightly higher on the landscape than the Litro soils. Groom soils are fine-silty and Haggerty soils are sandy. Perry soils are in similar positions and have an alkaline substratum.

Typical pedon of Litro clay, frequently flooded; about 3 miles northeast of Dean, 1,375 feet east and 1,530 feet north of the southwest corner of sec. 36, T. 23 N., R. 3 E.; USGS Fish Lake topographic quadrangle; latitude 32 degrees 56 minutes 05 seconds N.; longitude 92 degrees 06 minutes 59 seconds W.

A—0 to 6 inches; dark gray (10YR 4/1) clay; common medium distinct brown (10YR 4/3) mottles and few medium distinct brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; firm; many fine and medium roots; very strongly acid; clear smooth boundary.

Bg1—6 to 16 inches; dark gray (10YR 4/1) clay; many medium distinct brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; shiny pressure faces on peds; extremely acid; clear smooth boundary.

Bg2—16 to 29 inches; gray (10YR 5/1) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; few slickensides that do not intersect; shiny pressure faces on peds; extremely acid; gradual wavy boundary.

Bg3—29 to 47 inches; gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/4) mottles; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; few fine and medium roots; shiny pressure faces on peds; extremely acid; gradual wavy boundary.

Bg4—47 to 60 inches; gray (10YR 6/1) clay; common medium prominent yellowish brown (10YR 5/8) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; few fine and medium roots; extremely acid.

The thickness of the solum ranges from 60 to 100 inches. Reaction ranges from extremely acid to strongly acid. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 or 4, and chroma of 1 or 2. Thickness ranges from 3 to 8 inches.

The Bg and BCg horizons have hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. Mottles in shades of brown and yellow range from few to many.

Mahan Series

The Mahan series consists of well drained, moderately permeable soils that formed in loamy and clayey sediments. These soils are on uplands. Slopes range from 1 to 12 percent.

Soils of the Mahan series are clayey, kaolinitic, thermic Typic Hapludults.

Mahan soils commonly are near Bowie, Darley, and Sacul soils. All of these soils are in landscape positions similar to those of the Mahan soils. Bowie soils are fine-loamy and have a brownish subsoil. The Darley soils contain more layers and fragments of ironstone than the Mahan soils. Sacul soils have gray mottles in the upper part of the subsoil.

Typical pedon of Mahan fine sandy loam, 1 to 5 percent slopes; about 2.5 miles northwest of Farmerville, 800 feet south and 2,650 feet west of the northeast corner of sec. 23, T. 21 N., R. 1 W.; USGS Farmerville topographic quadrangle; latitude 32 degrees 47 minutes 54 seconds N.; longitude 92 degrees 26 minutes 21 seconds W.

A—0 to 4 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots and few coarse roots; about 10 percent, by volume, small angular, flattened, and slightly rounded fragments of ironstone; about 10 percent of fragments are larger than 3/4 inch in diameter; medium acid; clear smooth boundary.

BE—4 to 12 inches; reddish brown (5YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; flattened and angular fragments of ironstone make up 10 percent of the volume; medium acid; clear wavy boundary.

Bt1—12 to 27 inches; dark red (2.5YR 3/6) clay loam; common fine and medium prominent reddish yellow (7.5YR 6/6) mottles; moderate medium subangular blocky structure; firm; common fine and medium roots; few distinct clay films on faces of peds; about 5 percent, by volume, angular, flattened, and slightly rounded fragments of ironstone; strongly acid; clear wavy boundary.

Bt2—27 to 43 inches; dark red (2.5YR 3/6) sandy clay loam; few fine prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; common distinct clay films on faces of peds; about 10 percent, by volume, angular and flattened ironstone fragments; strongly acid; clear smooth boundary.

Bt3—43 to 51 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; firm; few fine and medium roots; common distinct clay films on faces of peds; about 10 percent, by volume, flattened and angular ironstone fragments; few gray bodies of white kaolin clay; very strongly acid; clear smooth boundary.

BC—51 to 60 inches; red (2.5YR 5/8) sandy loam; weak coarse subangular blocky structure; firm; less than 5 percent, by volume, flattened and angular fragments of ironstone; common very fine pockets and horizontal seams of light brownish gray (10YR 6/2) kaolin clay; few thin layers of strong brown (7.5YR 5/6) material above the ironstone fragments; very strongly acid.

The solum is 40 to more than 60 inches thick. Gravel-sized ironstone fragments make up from about 0 to 15 percent of the volume of the solum. A few coarse ironstone fragments 2 to 20 inches across are in the A, Bt, and BC horizons of some pedons. The particle-size control section is 35 to 60 percent clay. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The A horizon has hue of 5YR, 7.5YR, or 10YR, value of 3 to 5, and chroma of 2 to 6. Reaction is strongly acid to medium acid, except where lime has been added to the soil. This horizon is 3 to 8 inches thick.

The BE horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 6. Reaction is strongly acid to medium acid. Texture is loamy fine sand, sandy loam, or fine sandy loam or their gravelly counterparts.

The Bt horizon has hue of 2.5YR, 5YR, or 10R, value of 4 or 5, and chroma of 6 or 8. Yellowish, reddish, and brownish mottles range from none to common. Some pedons have gray mottles in the lower part of the Bt horizon. Texture is clay, sandy clay, sandy clay loam, clay loam, or loam. Silt content of the Bt horizon is less than 30 percent. Reaction ranges from very strongly acid to medium acid.

The BC horizon has hue of 5YR, 2.5YR, or 10R, value of 4 or 5, and chroma of 6 or 8. Mottles in shades of brown and gray range from none to common. Texture is sandy loam, sandy clay loam, clay loam, or sandy clay. Reaction ranges from very strongly acid to medium acid.

Malbis Series

The Malbis series consists of well drained or moderately well drained, moderately slowly permeable soils that formed in loamy sediments. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the Malbis series are fine-loamy, siliceous, thermic Plinthic Paleudults.

Malbis soils commonly are near Kirvin, Ruston, Sacul, and Savannah soils. Kirvin, Ruston, and Sacul soils are in landscape positions similar to those of the Malbis soils. Kirvin and Sacul soils have a clayey particle-size control section. Ruston soils have more convex slopes than the Malbis soils, and they have a reddish subsoil. Savannah soils are on high terraces and have a fragipan.

Typical pedon of Malbis fine sandy loam, 1 to 5 percent slopes; about 2.1 miles west of Truxno, 1,375 feet north and 2,275 feet east of the southwest corner of sec. 26, T. 23 N., R. 1 W.; USGS Truxno topographic quadrangle; latitude 32 degrees 57 minutes 00 seconds N; longitude 92 degrees 26 minutes 29 seconds W.

A—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium subangular blocky structure; very friable; common fine and few medium roots; very strongly acid; clear smooth boundary.

E—8 to 15 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak medium platy structure; very friable; common fine and few medium roots; common medium tubular pores; strongly acid; gradual smooth boundary.

Bt—15 to 31 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; common fine and few medium roots; many fine tubular pores; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.

Btv1—31 to 47 inches; yellowish brown (10YR 5/6) sandy clay loam; few medium prominent yellowish red (5YR 4/6) mottles and few medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; firm; few medium roots; common medium tubular pores; common distinct clay films on faces of peds; about 5 percent plinthite nodules; yellowish red mottles make up about 5 percent of the volume and are slightly brittle; very strongly acid; clear wavy boundary.

Btv2—47 to 60 inches; yellowish brown (10YR 5/8) sandy clay loam; few medium prominent yellowish red (5YR 4/6) mottles and common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; firm; common medium tubular pores; few faint clay films on faces of peds; about 8 percent plinthite nodules; yellowish red mottles make up about 15 percent of the volume and are brittle; very strongly acid.

The thickness of the solum is 60 inches or more. The depth to horizons that contain more than 5 percent plinthite ranges from 25 to 50 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 3 to 5 and chroma of 2 or 3. It is 4 to 8 inches thick. Reaction ranges from very strongly acid to medium acid.

The E horizon has value of 5 or 6 and chroma of 2 to 4. Reaction ranges from very strongly acid to medium acid. Texture of the E horizon is loam, sandy loam, or fine sandy loam.

The Bt and Btv horizons have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. Few to many mottles of red, yellow, or brown are in most pedons, and they are slightly brittle or brittle. Mottles in shades of gray are at depths below 30 inches. Texture of the Bt and Btv horizons is loam, sandy clay loam, or clay loam. The Btv horizon contains 5 to 25 percent plinthite. Slightly brittle or brittle bodies make up 5 to 40 percent of the volume of the Btv horizon. Reaction in the Bt and Btv horizons is very strongly acid to strongly acid.

McLaurin Series

The McLaurin series consists of well drained, moderately permeable soils that formed in loamy sediments. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the McLaurin series are coarse-loamy, siliceous, thermic Typic Paleudults.

McLaurin soils commonly are near Betis, Briley, Darley, Ruston, Smithdale, and Trep soils. Betis, Briley, and Ruston soils are in landscape positions similar to those of the McLaurin soils. Darley and Smithdale soils are mainly on side slopes. Trep soils are on broad ridgetops. Betis soils have a sandy particle-size control section. Briley and Trep soils have a thick, sandy surface layer and subsurface layer. Darley soils have a clayey subsoil. Ruston and Smithdale soils are fine-loamy.

Typical pedon of McLaurin fine sandy loam, 1 to 5 percent slopes; about 3.75 miles northwest of Bernice, 1,800 feet west and 2,900 feet north of the southeast corner of sec. 29, T. 22 N., R. 3 W.; USGS Bernice topographic quadrangle; latitude 32 degrees 52 minutes 08 seconds N.; longitude 92 degrees 41 minutes 50 seconds W.

A—0 to 6 inches; brown (10YR 5/3) fine sandy loam; weak fine and medium granular structure; very friable; many fine and common medium roots; very strongly acid; clear smooth boundary.

E—6 to 11 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine subangular blocky structure; very friable; common medium roots; few medium discontinuous random tubular pores; strongly acid; clear way boundary.

EB—11 to 17 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine subangular blocky structure; very friable; common fine roots; common fine discontinuous random tubular pores; strongly acid; clear wavy boundary.

Bt1—17 to 28 inches; red (2.5YR 4/6) sandy loam; weak medium subangular blocky structure; very friable; common fine roots; common fine discontinuous random tubular pores; clay bridges between sand grains; few distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—28 to 41 inches; red (2.5YR 5/8) fine sandy loam; common medium distinct reddish yellow (5YR 6/6) mottles; weak coarse subangular blocky structure; friable; few fine roots; common fine discontinuous random tubular pores; clay bridges between sand grains; few distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

B/E—41 to 48 inches; yellowish red (5YR 4/8) (B) and reddish yellow (7.5YR 6/6) (E) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; medium acid; gradual wavy boundary.

B't—48 to 60 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; very friable; sand grains are coated and bridged with clay; medium acid.

The solum thickness ranges from 60 inches to more than 80 inches. Ironstone fragments and gravel make up from 1 to 5 percent of the volume in some pedons. Reaction is very strongly acid to strongly acid.

The A horizon has value of 3 to 5 and chroma of 2 or 3. It is 3 to 9 inches thick.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 6 or hue of 7.5YR, value of 5 and chroma of 4. Texture is sandy loam, fine sandy loam, loamy fine sand, or loamy sand.

The EB horizon has value of 5 or 6 and chroma of 4 to 8. Texture is sandy loam, fine sandy loam, loamy sand, or loamy fine sand.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. Texture is loam, sandy loam, or fine sandy loam.

The B part of the B/E horizon has the same colors as the Bt horizon. The E part has hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 3 to 8. The E part makes up about 10 to 25 percent, by volume, of this horizon. Texture of the B and E parts is loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

The B't horizon has the same colors as the Bt horizon. Texture is sandy loam, loam, or sandy clay loam.

Ochlockonee Series

The Ochlockonee series consists of moderately well drained, moderately rapidly permeable soils that formed in loamy and sandy alluvium. These soils are on flood plains. They are frequently flooded. Slopes range from 0 to 2 percent.

Soils of the Ochlockonee series are coarse-loamy, siliceous, acid, thermic Typic Udifluvents.

Ochlockonee soils commonly are near Cahaba, Guyton, Harleston, Iuka, and Ouachita soils. Cahaba and Harleston soils are at a higher elevation on stream terraces or remnants of stream terraces and have a well developed argillic horizon. Guyton soils are lower on the landscape than those of the Ochlockonee soils, are grayish throughout the profile, and are fine-silty. Iuka soils are in slightly lower positions on the flood plain and have grayish mottles within 20 inches of the surface. Ouachita soils are in similar positions on the landscape as the Ochlockonee soils and are fine-silty.

Typical pedon of Ochlockonee fine sandy loam, in an area of Iuka-Ochlockonee, frequently flooded; about 2.75 miles southeast of Laran, 2,150 feet north and 1,300 feet west of the southeast corner of sec. 33, T. 23 N., R. 1 W.; USGS Truxno topographic quadrangle; latitude 32 degrees 56 minutes 15 seconds N.; longitude 92 degrees 28 minutes 11 seconds W.

A1—0 to 8 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; many fine roots and common medium roots; common fine and medium pores; very strongly acid; clear smooth boundary.

C1—8 to 24 inches; dark brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; friable; many fine roots; common fine and medium pores; very strongly acid; clear smooth boundary.

C2—24 to 45 inches; pale brown (10YR 6/3) loamy fine sand; massive; very friable; many medium and fine roots; common fine and medium pores; very strongly acid; clear smooth boundary.

C3—45 to 55 inches; yellowish brown (10YR 5/4) loamy fine sand; massive; very friable; common fine and medium roots; common medium and fine pores; very strongly acid; clear smooth boundary.

Bb—55 to 60 inches; mottled strong brown (7.5YR 5/6) and light gray (10YR 6/1) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; extremely acid.

In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 4. Reaction ranges from very strongly acid to slightly acid.

The C horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. Some pedons have mottles in shades of brown. In some pedons, mottles with chroma of 2 or less occur at depths below 20 inches. Strata within the C horizon range from loamy fine sand to loam. Reaction ranges from very strongly acid to slightly acid.

Buried horizons below 40 inches are in many pedons. The content of clay ranges from 18 to 35 percent clay. Reaction ranges from extremely acid to slightly acid.

Ora Series

The Ora series consists of moderately well drained soils that have a fragipan. These soils formed in loamy sediments. Permeability is moderate in the upper part of the soil and moderately slow in the fragipan. The Ora soils are on high terraces. Slopes range from 1 to 12 percent.

Soils of the Ora series are fine-loamy, siliceous, thermic Typic Fragiudults.

Ora soils commonly are near the Libuse, Ruston, Sacul, Savannah, and Smithdale soils. The Libuse and Savannah soils are in landscape positions similar to those of the Ora soil and have a strong brown to yellowish brown subsoil. The Ruston, Sacul, and Smithdale soils are on uplands and do not have a fragipan. Also, the Sacul soils have a clayey particle-size control section.

Typical pedon of Ora fine sandy loam, 1 to 5 percent slopes; about 1.75 miles southeast of Crossroads, 600 feet south and 200 feet west of the northeast corner of sec. 19, T. 20 N., R. 3 E.; USGS Rocky Branch topographic quadrangle; latitude 32 degrees 42 minutes 42 seconds N.; longitude 92 degrees 11 minutes 31 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate medium granular structure; friable; very strongly acid; abrupt smooth boundary.

E—4 to 11 inches; brown (10YR 5/3) fine sandy loam; weak medium subangular blocky structure; friable; strongly acid; clear smooth boundary.

BE—11 to 17 inches; yellowish red (5YR 4/6) and dark brown (10YR 4/3) loam; moderate medium subangular blocky structure; friable; very strongly acid; gradual smooth boundary.

Bt—17 to 29 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btx1—29 to 37 inches; yellowish red (5YR 4/8) sandy clay loam; reddish yellow (7.5YR 6/6) seams between pedons; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm and brittle; common distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.

Btx2—37 to 45 inches; strong brown (7.5YR 5/6) sandy loam; reddish yellow (7.5YR 6/4) seams between pedons; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm and brittle; common distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.

C—45 to 60 inches; strong brown (7.5YR 5/6) sandy loam; massive; friable; very strongly acid.

The thickness of the solum ranges from 40 to 70 inches. Depth to the fragipan ranges from 18 to 42 inches. The soil ranges from extremely acid to strongly acid, except where the soil has been limed. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 3 to 5 and chroma of 1 to 4. Thickness ranges from 2 to 5 inches.

The E horizon has value of 4 or 5 and chroma of 2 to 4. Texture is sandy loam, fine sandy loam, silt loam, or loam.

The BE horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is sandy loam, fine sandy loam, silt loam, or loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. Texture is loam, sandy clay loam, or clay loam.

The Btx and C horizons are mottled in shades of yellow, brown, gray, and red or have yellowish brown matrix colors that are mottled in shades of gray, yellow, and red. Texture is sandy clay loam, loam, or sandy loam.

Ouachita Series

The Ouachita series consists of well drained, moderately slowly permeable soils that formed in loamy alluvium. These soils are on flood plains. They are frequently flooded. Slopes range from 0 to 2 percent.

Soils of the Ouachita series are fine-silty, siliceous, thermic Fluventic Dystrochrepts.

Ouachita soils commonly are near Cahaba, Guyton, Harleston, Iuka and Ochlockonee soils. Cahaba and Harleston soils are at a higher elevation on stream terraces and have a well developed argillic horizon. Ochlockonee soils are in landscape positions similar to those of the Ouachita soils and are coarse-loamy. Guyton soils are in lower positions and are poorly drained and grayish throughout the profile. Iuka soils are slightly lower on the landscape than the Ouachita soils and have gray mottles within 20 inches of the surface.

Typical pedon of Ouachita silt loam, in an area of Guyton-Ouachita silt loams, frequently flooded; about 3.5 miles northwest of Bernice, 1,800 feet east and 1,500 feet south of the northwest corner of sec. 21, T. 22 N., R. 3 W.; USGS Lillie topographic quadrangle; latitude 32 degrees 53 minutes 07 seconds N.; longitude 92 degrees 41 minutes 04 seconds W.

A1—0 to 2 inches; dark brown (10YR 4/3) silt loam; weak medium subangular blocky structure; very friable; common fine and few coarse roots; very strongly acid; gradual smooth boundary.

A2—2 to 9 inches; brown (10YR 5/3) silt loam; weak medium subangular blocky structure; very friable; common fine roots; very strongly acid; gradual smooth boundary.

Bw1—9 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; common fine roots; very strongly acid; gradual wavy boundary.

Bw2—16 to 21 inches; dark yellowish brown (10YR 4/4) silt loam; common medium faint pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Bw3—21 to 27 inches; brown (10YR 4/3) silt loam; common medium faint pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Bw4—27 to 43 inches; mottled grayish brown (10YR 5/2), yellowish brown (10YR 5/4), and yellowish brown (10YR 5/8) silt loam; weak medium subangular blocky structure; friable; very strongly acid; clear smooth boundary.

Agb—43 to 55 inches; light brownish gray (10YR 6/2) very fine sandy loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; very strongly acid; abrupt smooth boundary.

Bgb—55 to 60 inches; grayish brown (10YR 5/2) silty clay loam; many coarse distinct yellowish brown (10YR 5/4) mottles and common medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; very strongly acid.

The solum is 40 to 80 inches thick. Reaction is very strongly acid to strongly acid throughout, except where lime has been added to the soil. The content of organic matter decreases irregularly with depth. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A1 and A2 horizons have value of 4 and chroma of 2 to 4 or value of 5 and chroma of 3. The A1 horizon is 1 to 6 inches thick, and the A2 horizon is 6 to 12 inches thick.

The Bw horizon has chroma of 3 to 8 or value of 4 and chroma of 2. Mottles are in shades of brown. Gray mottles are in the lower part in some pedons. Texture is silt loam, loam, very fine sandy loam, or silty clay loam.

The Agb horizon has value of 6 or 7 and chroma of 1 to 3. Brownish mottles range from few to many. Texture is silt loam or very fine sandy loam.

The Bgb horizon has value of 5 or 6 and chroma of 1 or 2. Brownish mottles range from few to many. Texture is silt loam or silty clay loam.

Perry Series

The Perry series consists of poorly drained, very slowly permeable soils. These soils formed in clayey alluvium deposited by the Arkansas River. They are on flood plains. These soils are frequently flooded. Slopes are dominantly less than 1 percent.

The soils of the Perry series are very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts.

Perry soils commonly are near the Groom, Haggerty, Hebert, Litro, and Portland soils. The Groom and Hebert soils are higher on the landscape than the Perry soils and are fine-silty. The Haggerty soils are in slightly higher positions and are coarse-loamy. The Litro and Portland soils are in similar positions. The Litro soils are gray throughout the profile. The Portland soils have a subsoil that is reddish brown throughout the profile.

Typical pedon of Perry clay, frequently flooded; about 3 miles north of Sterlington, 75 feet west and 400 feet south of the northeast corner of sec. 8, T. 20 N., R. 4 E.; USGS Sterlington topographic quadrangle; latitude 32 degrees 44 minutes 28 seconds N.; longitude 92 degrees 04 minutes 15 seconds W.

A—0 to 4 inches; dark gray (10YR 4/1) clay; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; common very fine to medium roots; few fine black stains; very strongly acid; abrupt smooth boundary.

Bg—4 to 11 inches; gray (10YR 5/1) clay; common medium distinct brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; few fine to medium roots; few very fine black stains; very strongly acid; clear smooth boundary.

Bssg—11 to 18 inches; gray (10YR 5/1) clay; many medium distinct brown (7.5YR 4/4) mottles in the upper part and few medium prominent reddish brown (5YR 4/4) mottles in the lower part; moderate medium subangular blocky structure; firm; few fine to medium roots; few very fine black stains; few slickensides 2 to 3 inches wide on a 45 degree angle; very strongly acid; clear wavy boundary.

2BC—18 to 30 inches; dark reddish brown (5YR 3/4) clay; moderate medium subangular blocky structure; firm; few fine to medium roots; common very fine black stains; medium acid; clear wavy boundary.

2Ck1—30 to 48 inches; mottled reddish brown (5YR 4/4) and gray (10YR 5/1) clay; few medium prominent dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; few very fine black stains; common fine and medium calcium carbonate concretions; mildly alkaline; clear smooth boundary.

2Ck2—48 to 70 inches; dark reddish brown (5YR 3/4) clay; few medium prominent gray (10YR 5/1) mottles; moderate medium subangular blocky structure; firm; common fine and medium calcium carbonate concretions; many barite crystals; mildly alkaline.

The thickness of the solum ranges from 30 to 60 inches. The content of clay ranges from 60 to 85 percent throughout the solum. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The A horizon has value of 3 to 6 and chroma of 1 or 2. Reaction ranges from very strongly acid to slightly acid. Thickness ranges from 4 to 9 inches.

The Bg and Bssg horizons have value of 4 to 6. Mottles in shades of red and brown range from few to many. Reaction ranges from very strongly acid to neutral.

The 2BC horizon has value of 3 or 4 and chroma of 2 to 4. Reaction ranges from medium acid to moderately alkaline.

The 2Ck horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 1 to 4. It contains few to many fine to coarse concretions of carbonates. Reaction ranges from medium acid to moderately alkaline.

Portland Series

The Portland series consists of somewhat poorly drained, very slowly permeable soils. These soils formed in loamy and clayey alluvium deposited by the Arkansas River. They are on flood plains and are subject to occasional to frequent flooding. Slopes are dominantly less than 1 percent.

Soils of the Portland series are very-fine, mixed, nonacid, thermic Vertic Haplaquepts.

Portland soils commonly are near the Groom, Haggerty, Hebert, Perry, and Sterlington soils. The Groom, Hebert, and Sterlington soils are higher on the landscape than the Portland soils and are loamy throughout the profile. The Haggerty soils are in slightly higher positions and are coarse-loamy. Perry soils are in lower positions and have a subsoil that is gray in the upper part.

Typical pedon of Portland silty clay loam, occasionally flooded; about 2.5 miles north of Sterlington, 2,200 feet east and 75 feet north of the southwest corner of sec. 4, T. 20 N., R. 4 E.; USGS Sterlington topographic quadrangle; latitude 32 degrees 44 minutes 31 seconds N.; longitude 92 degrees 03 minutes 37 seconds W.

A1—0 to 6 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; firm; sticky, plastic; common fine to coarse roots; common organic stains throughout the horizon; very strongly acid; clear smooth boundary.

A2—6 to 13 inches; grayish brown (10YR 5/2) silty clay; common medium distinct dark yellowish brown (10YR 4/4) mottles; weak fine blocky structure; firm; sticky;

plastic; common fine roots; very strongly acid; clear smooth boundary.

Bw—13 to 22 inches; reddish brown (5YR 4/4) clay; few medium prominent grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; very firm; sticky, plastic; common fine roots; few fine pores; few fine black stains; few pressure faces; neutral; gradual wavy boundary.

Bss1—22 to 36 inches; reddish brown (5YR 4/4) clay; common medium prominent dark grayish brown (10YR 4/2) mottles; moderate medium subangular blocky structure; very firm; sticky, plastic; few very fine roots; few fine pores; few fine calcium carbonate concretions; few fine black stains; few slickensides that do not intersect; many pressure faces; moderately alkaline; gradual wavy boundary.

Bss2—36 to 50 inches; reddish brown (5YR 4/4) clay; moderate medium subangular blocky structure; very firm; sticky, plastic; common medium and coarse calcium carbonate concretions; few slickensides that do not intersect; common pressure faces; moderately alkaline; gradual wavy boundary.

Cg—50 to 60 inches; gray (10YR 5/1) clay; common medium prominent reddish brown (5YR 4/4) mottles; massive; very firm; mildly alkaline.

The thickness of the solum ranges from 40 to 70 inches. The content of clay ranges from 60 to 85 percent in the control section. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The A horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. Mottles are in shades of gray or brown. Reaction is very strongly acid to strongly acid, except where limed. Texture of the Al horizon is silty clay loam or clay. Texture of the A2 horizon is silty clay or clay. The combined thickness of the Al and A2 horizons ranges from 3 to 17 inches.

The Bw and Bss horizons have hue of 5YR, value of 4, and chroma of 3 or 4 or hue of 7.5YR, value of 4 or 5, and chroma of 4. Texture is clay or silty clay. Reaction ranges from very strongly acid to moderately alkaline.

The Cg horizon has hue of 10YR, 5YR, or 7.5YR, value of 4 or 5, and chroma of 1 to 4. Texture is silty clay or clay. In some pedons the Cg horizon is stratified with thin layers of coarser textured material. Reaction ranges from slightly acid to moderately alkaline.

Ruston Series

The Ruston series consists of well drained, moderately permeable soils that formed in loamy sediments. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the Ruston series are fine-loamy, siliceous, thermic Typic Paleudults.

Ruston soils are similar to Cahaba soils, and they commonly are near Malbis, Savannah, and Smithdale soils. The Cahaba soils are on low stream terraces and have a solum less than 60 inches thick. Malbis soils have less convex slopes than the Ruston soils. They are brownish throughout the profile. Savannah soils are on high terraces and have a fragipan. Smithdale soils are on steeper side slopes and do not have a bisequum in its profile.

Typical pedon of Ruston fine sandy loam, 1 to 5 percent slopes; about 3.5 miles north of Downsville, 2,575 feet north and 300 feet east of the southwest corner of sec. 32, T. 20 N., R. 1 E.; USGS Downsville North topographic quadrangle; latitude 32 degrees 40 minutes 37 seconds N.; longitude 92 degrees 23 minutes 47 seconds W.

A—0 to 4 inches; brown (10YR 5/3) fine sandy loam; weak medium granular structure; friable; strongly acid; clear smooth boundary.

E—4 to 16 inches; pale brown (10YR 6/3) fine sandy loam; a few fine pockets of yellowish red (5YR 5/6) in lower part; weak subangular blocky structure; very friable; many fine pores; common fine streaks of uncoated sand grains; medium acid; clear smooth boundary.

Bt1—16 to 27 inches; yellowish red (5YR 4/6) sandy clay loam; moderate fine subangular blocky structure; friable; common distinct dark red (2.5YR 3/6) clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; clear wavy boundary.

Bt2—27 to 41 inches; yellowish red (5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common distinct dark red (2.5YR 3/6) clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; clear wavy boundary.

B/E—41 to 47 inches; yellowish red (5YR 5/6) fine sandy loam (Bt); weak medium subangular blocky structure; firm; common fine pores; 1/2 inch to 2 inch diameter pockets of somewhat brittle light yellowish brown (10YR 6/4) fine sandy loam (E) that makes up nearly 1/2 of the horizon; few faint clay films on faces of peds in Bt part; strongly acid; clear way boundary.

B't1—47 to 67 inches; coarsely mottled yellowish red (5YR 5/6), yellowish brown (10YR 5/4), red (2.5YR 4/6), and light gray (10YR 7/2) sandy clay loam; moderate medium subangular blocky structure; firm, somewhat brittle; few faint clay films in upper part and common faint clay films in lower part of horizon; very strongly acid.

B't2—67 to 92 inches; coarsely mottled red (2.5YR 4/6), yellowish brown (10YR 5/4), and strong brown (7.5YR

5/6) fine sandy loam; moderate medium subangular blocky structure; firm and brittle; few faint clay films on faces of peds; strongly acid; clear wavy boundary.

The thickness of the solum is 60 inches or more. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 55 percent of the effective cation-exchange capacity.

The A horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4. Reaction ranges from very strongly acid to slightly acid. Thickness ranges from 3 to 6 inches.

The E horizon and E part of the B/E horizon have value of 5 or 6 and chroma of 3 or 4. Texture is sandy loam, fine sandy loam, or loamy sand. Reaction ranges from very strongly acid to slightly acid.

The Bt and B't horizons and the Bt part of the B/E horizon have hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 4 to 8. The B't horizon can be mottled in shades of brown, red, and gray. The content of clay decreases from the upper part of the Bt horizon to the B/E horizon and increases again in the B't horizon. Texture is loam, sandy clay loam, fine sandy loam, or clay loam. Reaction ranges from very strongly acid to medium acid.

Sacul Series

The Sacul series consists of moderately well drained, slowly permeable soils that formed in loamy and clayey sediments. These soils are on uplands. Slopes range from 1 to 12 percent.

Soils of the Sacul series are clayey, mixed, thermic Aquic Hapludults.

Sacul soils commonly are near the Darley, Mahan, Ora, Ruston, and Sawyer soils. The Darley, Mahan, Ruston, and Sawyer soils are in similar positions on the landscape as the Sacul soils. The Ora soils are on high terraces. The Darley soils contain layers of ironstone in the subsoil. The Mahan soils do not have gray mottles in the upper part of the subsoil. The Ora and Ruston soils are fine-loamy. The Sawyer soils are fine-silty.

Typical pedon of Sacul very fine sandy loam, 1 to 5 percent slopes; about 3.3 miles northeast of Marion, 1,850 feet west and 300 feet south of the northeast corner of sec. 5, T. 22 N., R. 3 E.; USGS Marion East topographic quadrangle; latitude 32 degrees 55 minutes 49 seconds N.; longitude 92 degrees 10 minutes 45 seconds W.

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

E—3 to 8 inches; light yellowish brown (10YR 6/4) very fine sandy loam; common distinct yellowish brown (10YR 5/6) mottles; weak medium platy structure; friable; few fine roots; very strongly acid; clear smooth boundary.

Bt1—8 to 19 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm; plastic; few fine roots; common distinct clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—19 to 28 inches; red (2.5YR 4/6) clay; many medium prominent grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; plastic; few fine roots; common distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt3—28 to 40 inches; mottled grayish brown (10YR 5/2) and red (2.5YR 4/6) clay; weak medium subangular blocky structure; very firm; plastic; common distinct clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt4—40 to 52 inches; pale brown (10YR 6/3) clay; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; slightly plastic; common distinct clay films on faces of peds; very strongly acid; clear smooth boundary.

BCg—52 to 65 inches; light brownish gray (10YR 6/2) silty clay loam; common medium prominent yellowish red (5YR 5/6) mottles; weak medium subangular structure; firm; very strongly acid.

The thickness of the solum ranges from 40 to 72 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 3 or 4 and chroma of 2 or 3. Reaction ranges from very strongly acid to medium acid, except where the surface layer has been limed. Thickness ranges from 1 to 4 inches.

The E horizon has value of 4 to 6 and chroma of 3 or 4. Texture is very fine sandy loam, fine sandy loam, sandy loam, or loam. Reaction ranges from very strongly acid to medium acid.

The upper part of the Bt horizon has hue of 5YR, 2.5YR, or 10R, value of 3 to 5, and chroma of 6 or 8. Texture is silty clay or clay. Reaction ranges from extremely acid to strongly acid.

The lower part of the Bt horizon and the BCg horizon are mottled in shades of brown, red, and gray or the matrix has dominant value of 5 or 6 and chroma of 1 or 2. Texture is silty clay loam, clay loam, sandy clay loam, or silt loam. Reaction ranges from extremely acid to strongly acid.

Savannah Series

The Savannah series consists of moderately drained soils that have a fragipan. Permeability is moderate in the upper part of the soil and moderately slow in the lower part. These soils formed in loamy sediments. They are on high terraces. Slopes range from 1 to 12 percent.

Soils of the Savannah series are fine-loamy, siliceous, thermic Typic Fragiudults.

Savannah soils commonly are near the Guyton, Libuse, Ora, Ruston, and Sawyer soils. The Guyton soils are on flood plains of small drainageways and are poorly drained and gray throughout the profile. The Libuse and Ora soils are in landscape positions similar to those of the Savannah soils. The Ruston and Sawyer soils are on uplands. The Libuse soils are fine-silty. The Ora and Ruston soils have a redder subsoil than the Savannah soils. The Ruston and Sawyer soils have no fragipan.

Typical pedon of Savannah fine sandy loam, 1 to 5 percent slopes; about 0.75 mile northwest of Linville, 2,600 feet south and 2,650 feet east of the northwest corner of sec. 31, T. 22 N., R. 3 E.; USGS Haile topographic quadrangle; latitude 32 degrees 51 minutes 08 seconds N.; longitude 92 degrees 11 minutes 58 seconds W.

A1—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; friable; common fine roots; strongly acid; clear smooth boundary.

A2—5 to 8 inches; brown (10YR 5/3) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; strongly acid; clear smooth boundary.

E—8 to 13 inches; pale brown (10YR 6/3) fine sandy loam; few fine faint very pale brown mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; clear smooth boundary.

Bt1—13 to 19 inches; yellowish brown (10YR 5/6 and 5/4) loam; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—19 to 26 inches; yellowish brown (10YR 5/4 and 5/6) loam; moderate medium subangular blocky structure; friable; few fine and medium roots; few faint clay films on faces of peds; very strongly acid; clear smooth boundary.

Btx1—26 to 33 inches; yellowish brown (10YR 5/4) loam; moderate very coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm and slightly brittle; common fine pores; few distinct clay films on faces of peds; seams of pale brown (10YR 6/3) silt loam between prisms; very strongly acid; gradual wavy boundary.

Btx2—33 to 50 inches; yellowish brown (10YR 5/4) loam; moderate very coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm and brittle; few fine roots between peds; few fine pores; few distinct clay films on faces of peds; seams of light gray (10YR 7/2) and pale brown (10YR 6/3) silt loam between prisms; very strongly acid; gradual wavy boundary.

Btx3—50 to 60 inches; yellowish brown (10YR 5/4) sandy clay loam; moderate very coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm and brittle; few fine roots between prisms; few fine pores; few distinct clay films on faces of peds; seams of grayish brown (10YR 5/2) silt loam between peds; very strongly acid.

The thickness of the solum ranges from 50 to 80 inches. Depth to the fragipan ranges from 16 to 38 inches. Reaction is very strongly acid to strongly acid. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up from 15 to more than 50 percent of the effective cation-exchange capacity.

The A and E horizons have hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 2 to 6. Thickness of the A horizon ranges from 5 to 8 inches. Texture of the E horizon is silt loam, fine sandy loam, or sandy loam.

The Bt horizon has hue of 7.5YR, 10YR, or 2.5Y; and chroma of 4 to 8. It is sandy clay loam, clay loam, or loam.

The Btx horizon is multicolored in shades of yellow, brown, red, and gray, or it has a single matrix color in chroma of 4 to 8. Texture is sandy clay loam, clay loam, loam, or sandy loam.

Sawyer Series

The Sawyer series consists of moderately well drained, slowly permeable soils that formed in loamy and clayey sediments. These soils are on uplands. Slopes range from 1 to 8 percent.

Soils of the Sawyer series are fine-silty, siliceous, thermic Aquic Paleudults.

The Sawyer soils in this survey area are taxadjuncts to the Sawyer series because they are Alfisols rather than Ultisols. This difference does not significantly affect use and management of these soils.

The Sawyer soils commonly are near the Frizzell, Guyton, Libuse, Malbis, Sacul, and Savannah soils. The Frizzell soils are at lower elevations than the Sawyer soils and are coarse-silty. The Guyton soils are in drainageways and gray throughout the profile. The Malbis and Sacul soils are in landscape positions similar to those of the Sawyer soils. The Libuse and Savannah soils are on high terraces. Libuse soils have a fragipan. The Malbis and Savannah soils are fine-loamy. The Sacul soils have a clayey particle-size control section.

Typical pedon of Sawyer silt loam, 1 to 5 percent slopes; about 6 miles north of Marion, 1,650 feet west and 100 feet north of the southeast corner of sec. 4, T. 23 N., R. 2 E.; USGS Strong topographic quadrangle; latitude 33 degrees 00 minutes 16 seconds N.; longitude 92 degrees 15 minutes 50 seconds W.

A—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common medium and fine roots; very strongly acid; clear smooth boundary.

Bt1—9 to 22 inches; strong brown (7.5YR 5/6) loam; few fine distinct yellowish brown mottles (10YR 5/4); moderate medium subangular blocky structure; friable; common medium roots; common distinct clay films on faces of peds; few fine black concretions; very strongly acid; clear smooth boundary.

Bt2—22 to 35 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; few fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; common medium roots; common distinct clay films on faces of peds; few fine black concretions; very strongly acid; clear smooth boundary.

Btg1—35 to 53 inches; gray (10YR 5/1) silty clay; common medium distinct strong brown (7.5YR 5/6) mottles; few fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few medium roots; common distinct clay films on faces of peds; few fine black concretions; upper 2 inches of horizon has light gray (10YR 7/1) silt coatings on faces of peds; very strongly acid; clear smooth boundary.

Btg2—53 to 60 inches; light brownish gray (10YR 6/2) silty clay; many medium distinct yellowish brown (10YR 5/4) mottles; few fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few distinct clay films on faces of peds; strongly acid.

The thickness of the solum ranges from 60 to 80 inches. Reaction is very strongly acid to strongly acid. Gravel content ranges from 0 to 5 percent. In at least one subhorizon within 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 4 or 5 and chroma of 2 to 4. Thickness ranges from 4 to 10 inches.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 and chroma of 4 to 8. Texture is silt loam, loam, or silty clay loam. In some pedons, the lower part of the Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Mottles range from none to common and are in shades of gray, red, or brown.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2 and has mottles in shades of gray, brown, and red. Texture is silty clay loam, silty clay, or clay.

Smithdale Series

The Smithdale series consists of well drained, moderately permeable soils that formed in loamy sediments. These soils are on uplands. Slopes range from 8 to 15 percent.

Soils of the Smithdale series are fine-loamy, siliceous, thermic Typic Hapludults.

Smithdale soils are similar to Cahaba soils and commonly are near McLaurin and Ruston soils. The Cahaba soils are on low stream terraces and have sola less than 60 inches thick. The McLaurin and Ruston soils are mainly on ridgetops. McLaurin soils are coarse-loamy. Ruston soils have a bisequum.

Typical pedon of Smithdale fine sandy loam, 8 to 15 percent slopes; about 6.8 miles east of Farmerville, 2,490 feet south and 2,490 feet west of the northeast corner of sec. 5, T. 20 N., R. 2 E.; USGS DeLoutre topographic quadrangle; latitude 32 degrees 45 minutes 01 second N.; longitude 92 degrees 17 minutes 05 seconds W.

A—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; common coarse and fine roots; very strongly acid; clear smooth boundary.

E—8 to 16 inches; pale brown (10YR 6/3) fine sandy loam; weak medium granular structure; very friable; few medium and fine roots; strongly acid; clear wavy boundary.

BE—16 to 24 inches; brown (7.5YR 5/4) sandy loam; weak medium granular structure; very friable; few fine roots; very strongly acid; clear smooth boundary.

Bt1—24 to 30 inches; red (2.5YR 4/6) sandy clay loam; weak fine subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—30 to 40 inches; yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt3—40 to 60 inches; yellowish red (5YR 5/6) sandy loam; weak medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; few pockets of light yellowish brown (10YR 6/4) sand grains; very strongly acid.

The thickness of the solum is more than 60 inches.

Reaction is very strongly acid to strongly acid, except for surface layers that have been limed. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The A horizon has chroma of 1 to 3. Thickness ranges from 2 to 10 inches.

The E horizon has value of 5 or 6 and chroma of 2 to 4. Texture is fine sandy loam, sandy loam, or loamy sand.

The BE horizon has hue of 7.5YR, 10YR, or 5YR, value of 4 or 5, and chroma of 4 to 8. Texture is fine sandy loam, sandy loam, loamy sand, or loamy fine sand.

The Bt horizon has chroma of 6 or 8. Mottles in shades of red and brown range from none to many. Texture in the upper part is sandy clay loam, clay loam, or loam. Texture in the lower part of the Bt horizon is loam or sandy loam.

Smithton Series

The Smithton series consists of poorly drained, moderately slowly permeable soils that formed in loamy sediments. These soils are on high and low stream terraces. They are subject to rare flooding. Slopes range from 0 to 2 percent.

Soils of the Smithton series are coarse-loamy, siliceous thermic Typic Paleaquults.

The Smithton soils commonly are near Harleston, Guyton, Iuka, and Ochlockonee soils. Guyton, Iuka, and Ochlockonee soils are on flood plains. Iuka and Ochlockonee soils do not have a well developed subsoil. Guyton soils are fine-silty. Harleston soils are slightly higher on the landscape than the Smithton soils. They are moderately well drained and have a subsoil that is yellowish brown in the upper part.

Typical pedon of Smithton fine sandy loam, 0 to 2 percent slopes; about 0.4 mile south of Lillie, 2,200 feet south and 375 feet east of the northwest corner of sec. 2, T. 22 N., R. 3 W.; USGS Lillie topographic quadrangle; latitude 32 degrees 55 minutes 31 seconds N.; longitude 92 degrees 39 minutes 16 seconds W.

A—0 to 5 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure; very friable; common fine and few medium roots; very strongly acid; clear smooth boundary.

Bg—5 to 14 inches; light brownish gray (10YR 6/2) fine sandy loam; common fine prominent strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable ; common fine and medium roots; very strongly acid; clear wavy boundary.

Btg1—14 to 25 inches; light brownish gray (10YR 6/2) sandy loam; weak medium subangular blocky structure; friable; few fine roots; few distinct clay films on faces of peds; strongly acid; gradual smooth boundary.

Btg2—25 to 32 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; few fine and medium concretions; very strongly acid; gradual wavy boundary.

Btg3—32 to 39 inches; gray (10YR 6/1) sandy loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid; gradual smooth boundary.

Btg4—39 to 60 inches; light brownish gray (10YR 6/2) loam; common coarse distinct yellowish brown (10YR 5/6) mottles and common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; extremely acid.

The solum is more than 60 inches thick. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity. The content of gravel ranges from none to less than 5 percent of the volume in all horizons.

The A horizon has value of 3 to 5 and chroma of 1 or 2. It is 1 to 5 inches thick. Reaction is very strongly acid to strongly acid.

The Eg horizon has value of 5 to 7 and chroma of 1 or 2. Texture is fine sandy loam, loam, very fine sandy loam, or sandy loam. Mottles are in shades of brown. Reaction ranges from extremely acid to strongly acid.

The Btg horizon has value of 5 to 7 and chroma of 2 or less. Mottles are in shades of brown or yellow and range from few to many. Some horizons are mottled in shades of gray. Texture is fine sandy loam, very fine sandy loam, sandy loam, or loam. Reaction ranges from extremely acid to strongly acid.

Sterlington Series

The Sterlington series consists of well drained, moderately permeable soils that formed in loamy alluvium deposited by the Arkansas River. They are on natural levees bordering the Ouachita River. The soils are subject to rare flooding. Slopes range from 1 to 3 percent.

Soils of the Sterlington series are coarse-silty, mixed, thermic Typic Hapludalfs.

Sterlington soils commonly are near the Hebert, Perry, and Portland soils. The Hebert soils are slightly lower on the landscape than the Sterlington soils and are fine-silty.

The Perry and Portland soils are in lower positions and have a clayey subsoil.

Typical pedon of Sterlington very fine sandy loam, 1 to 3 percent slopes; about 2.2 miles north of Sterlington, 175 feet north and 3,000 feet west of the southeast corner of sec. 9, T. 20 N., R. 4 E.; USGS Sterlington topographic quadrangle; latitude 32 degrees 42 minutes 40 seconds N.; longitude 92 degrees 03 minutes 48 seconds W.

A—0 to 3 inches; brown (10YR 4/3) very fine sandy loam; weak medium subangular blocky structure; very friable; few very fine to medium roots; very strongly acid; abrupt smooth boundary.

E—3 to 10 inches; brown (7.5YR 5/4) very fine sandy loam; weak medium platy structure; very friable; few very fine to medium roots; strongly acid; clear wavy boundary.

Bt—10 to 18 inches; yellowish red (5YR 4/6) silt loam; few fine prominent brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; friable; few fine to medium roots; few very fine pores; few faint clay films on faces of peds; very strongly acid; clear irregular boundary.

B/E—18 to 25 inches; about 65 percent yellowish red (5YR 4/6) silt loam (Bt) and 35 percent light brown (7.5YR 6/4) very fine sandy loam (E); weak medium subangular blocky structure; very friable; few very fine roots; very strongly acid; clear irregular boundary.

B't—25 to 42 inches; yellowish red (5YR 5/6) silt loam; about 10 percent light brown (7.5YR 6/3) material in this horizon; moderate medium subangular blocky structure; friable; few very fine and fine roots; few very fine pores; few faint clay films on faces of peds; very strongly acid; clear smooth boundary.

C—42 to 60 inches; brown (7.5YR 5/4) very fine sandy loam; massive; very friable; few very fine roots; strongly acid.

The thickness of the solum ranges from 40 to 60 inches. In at least one subhorizon within a depth of 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has hue of 5YR, 7.5YR, or 10YR, value of 3 to 5, and chroma of 2 to 4. Reaction ranges from very strongly acid to medium acid, except where limed. Thickness ranges from 3 to 8 inches.

The E horizon and the E part of the B/E horizon have colors similar to those of the A horizon and includes value of 6. Texture is silt loam or very fine sandy loam. Reaction ranges from very strongly acid to medium acid.

The Bt and B't horizon and the Bt part of the B/E horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. Texture is silt loam or very fine sandy loam. Reaction ranges from very strongly acid to slightly acid. Subhorizons of the Bt horizon commonly contain E material that has colors of 3 or more chroma.

The C horizon has colors and texture similar to the Bt and B't horizons. It is very fine sandy loam, loam, silt loam, or silty clay loam. Reaction ranges from very strongly acid to neutral.

Trep Series

The Trep series consists of moderately well drained soils that formed in sandy and loamy sediments. Permeability is rapid in the upper part of the soil and moderate to moderately slow in the lower part. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the Trep series are loamy, siliceous, thermic Arenic Paleudults.

Trep soils commonly are near Angie, Bowie, Briley, Eastwood, and McLaurin soils. Angie and Eastwood soils are at a lower elevation than the Trep soils and have a loamy and clayey subsoil. Bowie, Briley, and McLaurin soils are in landscape positions similar to those of the Trep soils. Bowie soils are fine-loamy. Briley soils have a red and yellowish red subsoil. McLaurin soils are coarse-loamy.

Typical pedon of Trep loamy fine sand, 1 to 5 percent slopes; about 2.25 miles southwest of Lillie, 800 feet east and 2,250 feet south of the northwest corner of sec. 9, T. 22 N., R. 3 W.; USGS Lillie topographic quadrangle; latitude 32 degrees 54 minutes 48 seconds N.; longitude 92 degrees 41 minutes 18 seconds W.

Ap—0 to 5 inches; brown (10YR 5/3) loamy fine sand; weak fine granular structure; very friable; many fine and medium roots and few coarse roots; common dark brown (10YR 4/3) organic stains; few chert pebbles; strongly acid; clear smooth boundary.

E1—5 to 16 inches; pale brown (10YR 6/3) loamy fine sand; weak coarse subangular blocky structure parting to single grained; very friable; few fine and medium roots; few medium discontinuous tubular pores; few chert pebbles; strongly acid; clear smooth boundary.

E2—16 to 34 inches; very pale brown (10YR 7/3) loamy fine sand; weak coarse subangular blocky structure parting to weak fine subangular blocky; very friable; few medium and coarse roots; few medium discontinuous tubular pores; few chert pebbles; strongly acid; clear smooth boundary.

Bt1—34 to 46 inches; yellowish brown (10YR 5/6) sandy clay loam; many medium distinct strong brown (7.5YR 5/6) and pale brown (10YR 6/3) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; friable; few medium roots; common medium discontinuous tubular pores; common distinct clay films on faces of peds; few chert pebbles; strongly acid; clear wavy boundary.

Bt2—46 to 60 inches; mottled yellowish brown (10YR 5/6), yellowish red (5YR 5/6), red (2.5YR 4/6), and light brownish gray (10YR 6/2) sandy clay loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; friable; few medium roots; common distinct clay films on faces of peds; few chert pebbles; strongly acid; clear wavy boundary.

The solum is 60 to more than 80 inches thick. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. Reaction ranges from strongly acid to slightly acid. This horizon is 4 to 10 inches thick.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 or 4. Texture is loamy fine sand or fine sand. Reaction ranges from strongly acid to slightly acid.

The upper part of the Bt horizon has value of 5 or 6 and chroma of 4 to 8. Texture is sandy clay loam or loam. Reaction ranges from very strongly acid to medium acid. Mottles in shades of red or brown range from few to common. The lower part of the Bt horizon is mottled in shades of brown, red, and gray. Texture is sandy clay loam or loam. In some pedons, it is sandy clay. Reaction is very strongly acid to strongly acid.

Warnock Series

The Warnock series consists of moderately well drained, moderately permeable soils that formed in loamy sediments. These soils are on uplands. Slopes range from 1 to 5 percent.

Soils of the Warnock series are fine-loamy, siliceous, thermic Typic Paleudults.

Warnock soils commonly are near Angie, Bowie, Kirvin, Ruston, and Trep soils. Angie and Kirvin soils are at similar elevations as Warnock soils, and they have a loamy and clayey subsoil. Bowie and Ruston soils are in landscape positions similar to those of the Warnock soils. Bowie soils contain plinthite in the subsoil. Ruston soils have a reddish subsoil.

Typical pedon of Warnock fine sandy loam, 1 to 5 percent slopes; about 1.3 miles northwest of Lillie, 100 feet south and 600 feet east of the northwest corner of sec. 34, T. 23 N., R. 3 W.; USGS Lillie topographic quadrangle; latitude 32 degrees 56 minutes 46 seconds N.; longitude 92 degrees 40 minutes 15 seconds W.

A1—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium subangular blocky structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

A2—5 to 9 inches; brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; strongly acid; clear smooth boundary.

E—9 to 15 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine and few medium roots; few small pebbles of chert; strongly acid; gradual smooth boundary.

Bt1—15 to 28 inches; strong brown (7.5YR 5/6) loam; moderate medium subangular blocky structure; friable; few fine and medium roots; common distinct clay films on faces of peds; few small pebbles of chert; strongly acid; clear smooth boundary.

Bt2—28 to 38 inches; strong brown (7.5YR 5/6) sandy clay loam; few medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; few fine and medium roots; common distinct clay films on faces of peds; few small rounded pebbles of chert; strongly acid; clear wavy boundary.

Bt3—38 to 47 inches; strong brown (7.5YR 5/6) sandy clay loam; common medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm and slightly brittle few faint clay films on faces of peds; few fine roots; about 4 percent plinthite nodules; few small pebbles of chert; strongly acid; gradual wavy boundary.

Btx1—47 to 56 inches; mottled red (2.5YR 4/6) and yellowish brown (10YR 5/6) clay loam; common medium prominent light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; about 2 percent, by volume, quartz pebbles; slightly brittle in about 35 percent mass; about 4 percent plinthite; few small pebbles of chert; very strongly acid; gradual wavy boundary.

Btx2—56 to 60 inches; strong brown (7.5YR 5/8) sandy clay loam; few medium prominent red (2.5YR 4/6) mottles and common medium prominent light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; slightly brittle in about 35 percent of mass; few small pebbles of chert; strongly acid.

The thickness of the solum is 60 inches or more. Soil reaction ranges from extremely acid to strongly acid. Fine rounded quartz pebbles range from one to about 10 percent, by volume, in all horizons. In at least one subhorizon within a depth of about 30 inches, exchangeable aluminum makes up 20 to 50 percent of the effective cation-exchange capacity.

The A horizon has value of 4 or 5 and chroma of 2, 3, or 4. It is 4 to 9 inches thick.

The E horizon has value of 5 or 6 and chroma of 2, 3, or 4. It is fine sandy loam, sandy loam, loamy fine sand, or loamy sand.

The Bt1 and Bt2 horizons have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4, 6, or 8. Mottles are in shades of red and brown and range from none to many. Texture is loam, sandy clay loam, or clay loam.

The Bt3 and Btx horizons have hue of 2.5YR, value of 5, and chroma of 4 to 6; hue of 10YR, value of 5, and chroma of 4, 6, or 8; value of 6, and chroma of 6 or 8; hue of 7.5YR, value of 5, and chroma of 6 or 8. Mottles are in shades of red, brown, or gray; or the horizons are multicolored in shades of red, brown, and gray. Texture is loam, sandy clay loam, or clay loam. Brittleness ranges from none to about 35 percent of mass. Plinthite content of these horizons is less than 5 percent.

Wrightsville Series

The Wrightsville series consists of poorly drained, very slowly permeable soils that formed in loamy and clayey sediments. These soils are on low stream terraces. They are occasionally flooded. Slopes are dominantly less than 1 percent.

Soils of the Wrightsville series are fine, mixed, thermic Typic Glossaqualfs.

Wrightsville soils commonly are near the Frizzell, Groom, Guyton, Perry, and Portland soils. The Frizzell, Groom, and Guyton soils are in landscape positions similar to those of the Wrightsville soils and are loamy throughout the profile. Perry and Portland soils are on flood plains and have a clayey subsoil that is reddish in some part.

Typical pedon of Wrightsville silt loam, occasionally flooded; about 3.5 miles northeast of Haile, 1,625 feet north and 1,200 feet west of the southeast corner of sec. 30, T. 22 N., R. 4 E.; USGS Harrell Lake topographic quadrangle; latitude 32 degrees 51 minutes 49 seconds N.; longitude 92 degrees 05 minutes 33 seconds W.

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable; many fine roots; very strongly acid; clear smooth boundary.

Eg1—4 to 12 inches; gray (10YR 6/1) silt loam; common medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; few fine and common medium roots; common fine pores; strongly acid; clear irregular boundary.

Eg2—12 to 19 inches; light gray (10YR 7/1) silt loam; weak medium subangular blocky structure; friable; few fine and common medium roots; common fine pores; very strongly acid; clear wavy boundary.

B/E—19 to 31 inches; grayish brown (2.5Y 5/2) silty clay (Bt) and light gray (10YR 7/1) silt loam tongues (Eg) about 1 inch wide; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure (Bt) and weak medium subangular blocky structure (E); firm (Bt) and friable (E); few fine roots; few fine pores; few distinct clay films on faces of peds; very strongly acid; clear smooth boundary.

Btg1—31 to 49 inches; light brownish gray (2.5Y 6/2) silty clay; many medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; few fine pores; few distinct clay films on faces of peds; extremely acid; gradual wavy boundary.

Btg2—49 to 60 inches; light brownish gray (2.5Y 6/2) silty clay; common medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; few fine pores; few distinct clay films on faces of peds; extremely acid; gradual wavy boundary.

The thickness of the solum ranges from 40 to 72 inches or more. Reaction ranges from extremely acid to strongly acid. In at least one subhorizon within 30 inches, exchangeable aluminum makes up 50 percent or more of the effective cation-exchange capacity.

The A horizon has value of 3 to 5 and chroma of 1 or 2. Thickness ranges from 1 to 5 inches.

The Eg horizon and the E part of the B/E horizon have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of gray and brown range from few to many.

The Btg horizon and the Bt part of the B/E horizon have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of yellow and brown range from few to many. Texture is silty clay loam, silty clay, or clay.

Genesis of the Soils

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This section explains soil genesis, the processes and factors of soil formation as they relate to the soils of Union Parish.

Soil genesis is the phase of soil science that deals with the processes and factors of soil formation (5). It is the study of the formation of soils on the land surface and of changes in soil bodies. It is the science of the evolution of soils that are conceived of as natural units (10, 23).

Internal and external forces influence soils. Generally, the internal forces are synonymous with soil-forming processes, and the external forces are synonymous with soil-forming factors. Soils generally are perceived to be a stable component of our environment; unless the soils are disturbed, they show very little change. Soil scientists, however, view soils as a dynamic system and can observe minute but important changes in the composition of the soil, depending upon when and how samples are taken (17). The following information gives a better understanding of how the soil survey can be used and how interpretations can be derived from it.

Processes of Soil Formation

The complex soil-forming processes are the gains, losses, translocations, and transformations that occur in the soil. These also influence the kind and degree of development of soil horizons (25). Soil-forming processes result in either additions to or losses from the soil of organic, mineral, and gaseous materials; translocations of materials from one point to another within the soil; and physical and chemical transformations of mineral and organic materials within the soil.

The addition of organic material to the soil is an important process that occurs to some extent in all soils. However, more organic matter accumulates in some soils than in others. Organic matter increases the available water and cation-exchange capacities of the soil, helps granulate the soil, and releases plant nutrients in the soil. Organic matter accumulates mainly in and above the surface horizon; consequently, the surface horizon is higher in organic matter content and is darker than the lower horizons.

Leaving crop residue and allowing leaf litter and other organic material to accumulate on the surface can help to maintain or increase the content of organic matter in the soil. Living organisms, through their activities, decompose these accumulations and mix them into the soil. Increasing the content of organic matter in the soil helps to control erosion.

The addition of mineral material on the surface has been important in the formation of some soils in Union Parish. The added material, generally in the form of alluvium, provides new parent material in which the processes of soil formation can occur. In many cases, new material has accumulated faster than the processes of soil formation could appreciably alter the material. As a result, depositional strata are evident in the lower horizons of many of the alluvial soils. Depositional strata are evident in the lower horizons of the Iuka and Ochlockonee soils. These soils have been forming in relatively young alluvial sediments. Liquids or gases added to the soil are generally compounds of nitrates and sulfates dissolved or trapped in rainwater.

The loss of components from the soil also is important in the overall process of soil development, although it is generally less noticeable than the addition of materials to the soils during soil formation. For example, as organic matter is decomposed, carbon dioxide is emitted into the atmosphere. Water also escapes from the soil by evaporation and transpiration from plants. On some soils, erosion has removed both mineral and organic materials. These losses are natural, to some extent, but in some places they are accelerated by human activities. In Union Parish, moving water is the greatest cause of erosion.

Leaching removes many water soluble compounds and elements from the soil. Water moving through the soil carries these soluble elements out of the soil. In many soils, the soluble elements have been moved completely out of the soil profile. Sandy and loamy soils, such as the Boykin, and Cahaba soils, are permeable, and most soluble bases are leached in a relatively short time. The more clayey soils, such as the Eastwood and Perry, are less permeable, and slowly moving water leaches smaller amounts of soluble elements. In some soils which formed from carbonate-containing parent material, such as Mahan soils, the carbonates have been leached from the profile. This is because of the relative high rainfall and the length of time parent material has been exposed to weathering. Relatively young soils that were initially high in bases show the least amount of leaching.

The translocation of material in the soil, either in eluviation or illuviation, has been an important process in the development of most of the soils in the parish. Eluviation is the moving of solids out of part of the soil profile, and illuviation is the moving of solids into a lower part of the soil profile. In soils that have large pores, soil material that is small enough to go through these pores can be suspended in water as it moves downward. The translocation and accumulation of clay in the profile is evident in some of the soils in Union Parish.

In many soils in the parish, iron and manganese move to and accumulate in the lower part of the profile. These accumulations result from alternating oxidizing and reducing conditions related primarily to the fluctuations of water-saturated zones within the soils. Reduction occurs when water saturates the soil for relatively long periods and when low amounts of oxygen are in the soil. It results in gray compounds of iron and manganese characteristic of the Btg and Cg horizons in Guyton soils. Prevailing reduced conditions and a fluctuating water table can translocate iron and manganese to a lower horizon and can precipitate them at the top of the saturated zone. Eastwood, Frizzell, and Sacul soils commonly have brownish or reddish mottles.

The transformation of mineral and organic substances in soils is also a major process of soil formation. Transformation processes include oxidation, reduction, hydration, solution, and hydrolysis. Oxidation is a geochemical reaction in well aerated soils and parent material. Its effect is easily recognized in the Mahan soils as the oxidation of the ferrous ion to the ferric materials. Ferrous iron is contained in the mineral or hornblende and pyroxene of the primary mineral group and is a component of soils that formed in glauconite or siderite such as the Darley and Mahan soils.

Hydration occurs when water molecules or hydroxyl groups are united with minerals without their being a part of the mineral itself. It generally occurs on the surfaces or edges of mineral grains or, partly, as the structure in simple salts. For example, after hydration, anhydrite mineralizes. Gypsum is commonly in clayey soils that contain sulfate, presumably from marine sediment, and calcium, either from marine sediment or mineral weathering.

Hydrolysis is the chemical reaction of the hydrogen ion with individual elements within crystal structures. The highly reactive hydrogen ion replaces one of the basic ions in the structure of the mineral. Hydrolysis generally is the most important chemical weathering process. It completely disintegrates primary minerals in all soils, thus making plant nutrients available to plants.

Solution is the simple process of water as the dissolving agent of salts, such as carbonates and sulfates. In solution, salts move through the soil and are either removed from the soil profile or deposited at a lower depth.

A soil-forming process that is not fully understood is the formation of fragipans. Fragipans are dense, brittle layers in the subsoil of some soils. The Libuse, Ora, and Savannah soils have a fragipan. Fragic material is dense and has many vesicular pores, but it does not readily allow water to move through it. Several hypotheses have been offered to explain the formation of fragipans. Either chemical or physical reactions or a combination of both reactions have resulted in their formation.

Factors of Soil Formation

External factors control the character and development of soils (12). These factors are important in understanding soil genesis. They may be an agent, force, condition, relationship or a combination of these that influence parent material (10). The five factors of soil formation are climate, organisms, parent material, relief, and time (15). They determine the characteristics of the soil, but not in terms of processes, causes, or forces active in the system. They can vary either singly or collectively.

Climate

Detailed information on the climate in Union Parish is given in the section "General Nature of the Parish."

Rainfall and temperature are the most commonly measured features of climate and have been the most closely correlated to soil properties (10). Although average climatic conditions are often given for a region, the extremes of climate in that region may have more influence in the development of certain soil properties. Rainfall and temperature can change, depending upon the relief or elevation within a general area.

Rainfall is relatively uniform throughout Union Parish. Major differences within the soils in the parish are not a result of variances in rainfall amounts. Boykin and Cahaba are some of the most highly leached soils, but they are different because they have different parent material. The solubility of elements in minerals increases as the temperature rises in summer. When temperatures are below freezing, the physical action of water, primarily in the form of ice, plays an important role in the physical destruction of the soil. This process has minimal influence in Union Parish, however, which does not experience extremely cold conditions. To a degree, the intensity and annual distribution of rainfall are more important than the absolute amount of rainfall. Rainfall in the parish is not equally distributed throughout the year, and some storms are severe. The intensity of rainfall has an effect on the type and rate of reactions.

Water erodes and deposits soil material, but its most important functions are within the soil profile. Some morphological characteristics result from excessive or inadequate amounts of water. In soils that are highly leached and acid, excessive amounts of water are indicated by grayish colors in the profile. The gray color is caused by reduction.

Temperature is considered an independent soil-forming factor that influences reactions in the soil-forming process. It is the driving force in most models of evapotranspiration. The combination of evapotranspiration and uneven rainfall distribution is perhaps the most important climatic factor in the soil-forming process. For every 10-degree rise in temperature, the speed of a chemical reaction increases by a factor of 2 to 3 (32). Solar radiation generally increases with increasing elevation. It increases at the most rapid rate in the lower, dust-filled layers of the air. The absorption of solar radiation at the surface is affected by many variables, such as soil color, plant cover, and aspect. South-facing slopes are always warmer than north-facing slopes. Temperature, unlike solar radiation, generally decreases with increasing elevation. The changes in elevation in Union Parish are not sufficient to have a significant effect on the mean annual soil temperature.

Organisms

The effect of organisms as a soil-forming factor is indicated by the presence or absence of major horizons in the soil profile. Properties associated with living organisms are also important to soil formation. For example, living organisms play a significant role in the cycling of carbon.

The carbon cycle takes place mainly in the biosphere. In photosynthesis, the sun's energy is used to transform carbon and other elements, such as nitrogen and sulfur, to produce organic material. As organic matter decomposes, it releases nitrogen for plant use and returns carbon dioxide directly to the atmosphere. Humus, a somewhat resistance organic material, stays in the soil. Because of its size and chemical composition, humus increases infiltration, available water capacity, and cation-exchange capacity and the absorption and storage capabilities of such nutrients as calcium, magnesium, and potassium. It also improves soil tilth.

The natural vegetation in Union Parish is quite diverse. The low flats and drainageways are primarily in hardwoods. The gently sloping areas are in mixed hardwoods and pine, and areas on the upper slopes and ridges are in pine and a few hardwoods. In soils with the same parent material, generally the reaction of soils in areas of hardwoods is slightly higher than that of soils in areas of pine. Soils that formed under hardwoods, pines, and mixed pines and hardwoods generally are thicker in the eluvial horizon than those that formed under prairie vegetation. In soils that developed under grass, the surface horizon is generally thicker and has more organic matter than in those that formed under pine or under mixed hardwoods and pine. The amount of organic matter accumulated in the soils depends on other factors, such as temperature and rainfall. Under optimal conditions for microbial activity, the production and decomposition of organic matter are in equilibrium. Accumulation of organic matter will not occur without a change in the factor controlling the equilibrium. The content of organic matter increases when its annual production is high and conditions are not favorable for its decomposition. In Union Parish, most soils exist in an ecosystem in which the rate of decomposition of organic matter exceeds the ability of the vegetation to return organic matter to the soils; therefore, the soils are low in organic matter.

Parent Material

Parent material has been defined as "the state of the soil system at time zero of soil formation" (15). It is that physical body and its associated chemical and mineralogical properties at the starting point that are changed by the other soil-forming factors over time. The influence of parent material on soil properties is greater on the younger soils than on the older soils. For example, the young luka soils exhibit more properties associated with the initial deposits than the much older Ruston soils, which may have very few properties in common with the initial parent material. In weathered soils, however, the influence of the parent material may be visible and the parent material can still be an independent factor in soil formation. The nature of the parent material can be expressed in the color, texture, and mineralogy of the soils. These properties can be related to physical and chemical properties, such as heat absorption, susceptibility to erosion, the shrink-swell potential, and cation-exchange capacity. The characteristics associated with parent material in the parish are described in the section "Landforms and Surface Geology."

Relief

The relief in Union Parish ranges from low on flood plains to moderate in the uplands. Relief associated with the physiographic and geologic units within the parish is described in more detail in the section "Landforms and Surface Geology."

Relief and the geologic physiographic units influenced soil formation as a result of their effects on drainage, runoff, and erosion. Within specific geographic regions, several soil properties associated with relief are depth of the solum, thickness of the A horizon and its content of organic matter, wetness or dryness, color of the profile, degree of horizon differentiation, soil reaction, and content of soluble salts.

Relief also affects the moisture relationships in the soil, either in the form of ground water or in the amount of water available for photosynthesis. The water table is closer to the surface in depressions than on high points on the landscape. In soils with the same parent material, the seasonal high water table is more commonly close to the surface in soils in areas of low relief than in soils on convex landscapes. If the parent material is clayey and has low relief, the soils on ridgetops may be the wettest on the landscape.

Time

When considering soil formation, a pedologist normally does not think in terms of depth in inches or centimeters but rather in terms of horizons, sola, and profile development. Rather than absolute time, the rate of change is what affects soil properties. Time as a rate of change is what affects soil properties. Time as a rate of change can be described in terms of relative stages of development, absolute dating of horizons and profiles, the rate of soil formation, and the relation to the age and slope of the landform and associated weathering complex (13, 14).

Several hypotheses or models in regard to time have been developed. The hypotheses of the continuous steady state system determined that time is uninterrupted and soil development begins at time zero (6, 16). The continuous steady state model shows that once a process or feature has begun, it continues to develop over time until one of the soil-forming factors greatly changes. Assuming no major change, the morphological feature in time would develop to the maximum extent without giving way to other features. At time zero, for example, the Iuka soils have no subhorizons. As the processes of soil development begin, a cambic horizon would develop over time until it reached its maximum. According to this theory, no additional change takes place in the other soil-forming processes, and time is the only thing that changes. Because soils represent a dynamic system, however, the continuous steady state hypothesis probably errs in the way it relates time to pedogenic development.

Another hypotheses of soil formation is the sequential model (4, 11). In this model all stages of soil development operate concurrently. Some processes of soil development operate concurrently. Some processes of soil development proceed so slowly that they have very little effect, whereas others are so rapid that they determine the dominant features of the soil. As long as the relative rates of the process continue unchanged, a given set or properties expresses soil development. The sequential model, sometimes referred to as polygenesis, has two major characteristics. First, a soil morphological entity may be a consequence of a combination of several genetic factors. Second, the morphological expression of soil processes may be a result of several pathways. For example, a given soil begins to form in loamy parent material on gently sloping uplands covered with pine forest under a climate similar to that of the present. A darkened surface horizon may form because of the accumulation of organic carbon. Subsequently, an E horizon and an argillic horizon may form. The result is a soil similar to the Ruston soils. As long as the parent material, climate, organisms, and relief did not change substantially over time, the soil would have formed sequentially. The factors, however, possibly could have changed. When some major factor changes, time as a factor of soil formation returns to zero. Because the changes made in a soil by any particular factor remain even after that factor changes, the total amount of time that the factors of soil formation were acting on the soil might not appear to differ from one soil to another.

Several methods can be used to determine the actual age of soils. Morphological properties, however, are most commonly used as a basis of dating the soils. For example, the Boykin soils, which have a thick E horizon, would normally be considered older than the Sacul soils, which have a relatively thin E horizon. Other factors, however, such as parent material, climate, and living organisms, also are important in determining horizon thicknesses. Although geology can indicate in gross terms the relative age of the soil, pedogenic time returns to zero each time major or catastrophic events affect the landscape. These events generally begin a major geologic period.

The rate of change in weathering decreases over time (11a). It becomes constant only when the soil material has been weathered to the maximum extent possible under the effects of a given combination of soil forming factors. Soil formation is seldom a uniform process over time. Minor fluctuations can constantly readjust the environmental conditions in the system. The relative ages of the soils and their parent material are described in the section "Landforms and Surface Geology."

Landforms and Surface Geology

Union Parish can be separated into three general physiographic areas—the recent alluvial plains, low stream terraces and high terraces, and the uplands. Each of these areas can be further divided on the basis of differences in parent material, time of deposition, or physiographic features.

Alluvial Plains

The soils on alluvial plains formed in Holocene alluvial deposits along the Ouachita River, Bayou D'Arbonne, Corney Bayou, Bayou de Loutre and numerous small streams that drain the uplands. These alluvial plains make up about 23 percent of the parish. Elevations range from about 50 feet above mean sea level in the eastern and southeastern parts of the parish to about 130 feet in the northern part. Elevations increase from south to north at a rate of about 2 feet per mile. The alluvial plains are mostly level or nearly level.

Partial sorting of sediments occurs when a stream overflows and the depositional pattern forms high, loamy natural levees near the stream channels. As the natural levees extend away from the stream channel, sediments are less sandy and grade into the clayey backswamp sediments. Differences in time of deposition, as well as partial sorting of the sediments, result in the formation of different kinds of soils. The backswamp soils in the Litro-Perry-Portland general soil map unit, as well as the Hebert and Sterlington soils on natural levees, formed on the alluvial plains of the Ouachita River.

Most of these sediments were from the Permian red beds and were transported in an ancestral Arkansas River channel. These sediments account for the characteristic red colors associated with most of these soils. When these sediments were deposited, they were relatively unweathered and typically contained free carbonates. The acid horizons in these soils are weathered products of several hundred years of leaching by rainfall and floodwater.

Litro soils formed at the lowest elevations in the backswamps and farthest away from the ancestral Arkansas River channel. Parent material of the Litro soil in Union Parish most likely consists of reduced Permian red bed clays deposited by the Arkansas River and Tertiary clays that have eroded from the surrounding uplands. These soils are generally acid throughout. They are frequently flooded for brief to long periods.

Perry and Portland soils formed in backswamp settings. Parent material is recent Permian red bed clays. Perry soils are in depressions. Portland soils are on ridges and at slightly higher elevations than the Perry soil. In places, both soils are underlain by older soils. The Perry and Portland soils are generally more acid in the upper horizons than in the lower horizons. They are subject to flooding.

The soils in the Guyton-Iuka-Ochlockonee general soil map unit formed on alluvial plains along streams that drain the uplands. These soils developed in sediments that have eroded from upland soils and were deposited by local streams. Guyton soils formed in loamy alluvium that is high in silt content. Iuka and Ochlockonee soils formed in sandy and loamy alluvium. All of these soils are acid throughout.

Low Stream Terraces and High Terraces

The soils on low stream terraces and on high terraces are along major upland streams and along the western boundary of the Ouachita River flood plain. These soils make up about 10 percent of the parish. Elevations range from about 70 feet to 180 feet. The soil areas are characterized by level to gently sloping topography.

The age of the sediments probably includes late Holocene, Deweyville, Prairie, and undifferentiated mid to late Pleistocene (24). Some of the soils on high terraces formed at least partially in loess. The age of the loess is undetermined, but it is generally agreed that these sediments are older than the Peoria loess that mantles the Macon Ridge in West Carroll Parish to the east. The loess is generally less than 5 feet thick in Union Parish and is probably the same age as the loess in Morehouse Parish. Soils, such as Frizzell and Libuse, probably formed in mixed loess and mid Pleistocene Ouachita River alluvial sediments.

The Groom-Haggerty general soil map unit is on late Pleistocene (Deweyville) or early Holocene terraces along the Ouachita River and Bayou D'Arbonne. The sediments in which these soils formed are younger, less dissected, and at lower elevations than those in the adjoining terraces. The Haggerty soil is commonly thought to be on late Pleistocene stream terraces. The landscape patterns in which the Haggerty soils are in Union and Morehouse Parish suggest that these sediments are relict beaches of an old lake. Elevations range from about 70 feet to about 85 feet.

At slightly higher elevations are soils of the Frizzell-Guyton-Wrightsville general soil map unit. Elevations range from about 85 feet to 125 feet. The landscape consists mainly of broad flats with little natural drainage. These soils are on Prairie and Deweyville Age terraces.

Soils of the Bienville-Smithton-Harleston general soil map unit are on the first terrace above the flood plains along upland streams such as Little Corney Bayou and Corney Bayou. Smaller areas are along Bayou de Loutre and Bayou D'Arbonne. The terraces on which these soils occur are probably Prairie or Deweyville age sediments. Elevations range from about 125 feet to about 170 feet.

At similar elevations are soils of the Libuse-Savannah-Ora general soil map unit. These soils formed in undifferentiated Pleistocene and loess sediments. They are adjacent to the uplands in the eastern part of the parish. These soils are level to strongly sloping.

Elevations range from 125 feet to 180 feet. This landscape is characterized by a thin veneer of loamy ironstone. Sometimes the loess is over a chert gravel impregnated ironstone, suggesting a Tertiary-eroded undifferentiated Pleistocene-loess toposequence.

Uplands

The upland soils of Union Parish were once thought to have formed entirely in Tertiary sediments. Soil and geologic investigations during the survey suggest that Pleistocene sediments may have at one time covered the entire Parish.

The soils of this physiographic area make up a part of the D'Arbonne structural platform. This platform has only a slight northeasterly regional dip; therefore, outcrops of the Tertiary formation occur as nearly horizontal beds. Erosion by relatively large streams, such as the Ouachita River, Bayou D'Arbonne, Corney Bayou, Little Corney Bayou, and Bayou de Loutre, has resulted in a highly dissected upland landscape. The valleys have strongly sloping and moderately steep side slopes with relatively wide, flat bottoms. The interfluves are gently sloping and range from narrow and convex to relatively broad ridgetops, depending upon the extent of dissection. Local relief of less than 100 feet to over 250 feet is common. The highest elevation is 285 feet. It is in the north-central part of the parish, just west of Oakland.

The Cook Mountain and the Cockfield Formations of the Claiborne Group were deposited during the Tertiary Period of the Eocene Epoch.

The Cook Mountain is the oldest formation outcropping in Union Parish (24). It is bedded marine sediment consisting mostly of yellowish to brown clays and fossiliferous mast in the lower part. The largest outcrop area makes up most of the uplands in the south, central, and southwestern parts of the parish. A high concentration of ironstone is a diagnostic indicator for the Cook Mountain Formation.

The Cockfield Formation is the younger of the Tertiary deposits exposed at the surface in Union Parish. The lower part of the formation is sideritic and glauconitic rich sand, silts, and clays. The upper part of the formation is predominantly nonmarine sediment of bedded, brown lignitic clays, silts, and sands. A major outcropping of the Cockfield Formation is in the north-central and northeastern parts of the parish. Petrified wood is a diagnostic indicator of the Cockfield Formation and the undifferentiated Pleistocene.

The undifferentiated Pleistocene deposits also are included in the uplands. These loamy alluvial terrace sediments are scattered throughout the uplands, generally on ridgetops in the higher parts of the landscape. In areas where the deposits were thick, side slopes are also covered. On some highly eroded landscapes, ridgetops that are near major channels, resistant Pleistocene chert gravel is "welded" to Tertiary ironstone. The presence of chert gravel generally indicates the base of undifferentiated Pleistocene sediments. However, not all sediments thought to be Pleistocene are underlain by thin layers of chert gravel.

Streams such as D'Arbonne, Middle Fork, Corney, Little Corney, Bayou de Loutre, and Little Bayou de Loutre are largely responsible for the downgrading and removal of Pleistocene sediments from the uplands on higher elevations west and north of Union Parish. The confluence of these major local streams may also account for the redeposition of some Pleistocene sediments in the parish. Of particular interest is an area that is an east to west trending of gravelly upland sediments through the Conway area to Corney Bayou. Even though this band is not very wide, it appears that this is an area of redeposition. Whether it is colluvium or stream, outwash is inconclusive.

The relationship between the soils and geology of the uplands is not entirely understood. Definitive data, which can help in distinguishing between loamy Tertiary sediments and loamy Pleistocene sediments is not available. Previously, loamy and sandy soils, such as Betis, Bowie, Briley, McLaurin, and Trep were thought to have formed in Tertiary sediments. Investigations in Union Parish indicate that all of these soils, except the Bowie, probably formed in Pleistocene sediments. Chert gravel is in or near most areas of these soils.

The soils in the Ruston-Smithdale-Malbis general soil map unit formed in undifferentiated Pleistocene loamy sediments. The Ruston soils in this map unit are mainly on the higher and less eroded ridgecrests. The Smithdale soils are mainly on side slopes, and the Malbis soils are on lower and broad ridgetops. The Ruston, Smithdale, and Malbis soils are mapped in all areas of the parish except the eastern edge.

The soils in the Sacul-Kirvin-Sawyer general soil map unit formed mainly in clayey sediments of the Cockfield Formation. However, in places, admixtures of Pleistocene loamy and silty sediments may be included in the upper portion of the Kirvin and Sawyer soils. The Sacul and Kirvin soils in this map unit are on both ridgetops and side slopes. Generally, the Sawyer soils are on ridgetops and side slopes that are broader or less convex than those where the Sacul and Kirvin soils occur. The Sacul, Kirvin, and Sawyer soils are mostly in the northern part of the parish.

The Darley and Mahan soils of the Darley-Sacul-Mahan general soil map unit formed in sediment of the Cook Mountain Formation. The Sacul soils formed in sediment of the Cockfield Formation. All of these soils are on both ridgetops and side slopes. These soils are mapped mainly adjacent to the major streams in the central and western parts of the parish.

In the northwestern part of the parish, thin veneers of undifferentiated Pleistocene loamy sediments remain on most ridgetops. The Ruston, McLaurin, and Warnock soils formed in these sediments. Clayey and loamy sediments of the Cook Mountain and Cockfield Formations outcrop on side slopes. Darley and Kirvin soils formed in these sediments. Soils of the Ruston-Darley-McLaurin and Darley-Kirvin-Warnock general soil map units make up these areas.

The soils of the Darley-Angie-Bowie general soil map unit are in the extreme northwestern and southwestern parts of the parish. They formed in clayey and loamy Cook Mountain and Cockfield Tertiary sediments.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

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:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

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.

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.

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 human or animal activities or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The movement of water into the soil is rapid.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

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 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of the 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 uppercase letter represents the major horizons. Numbers or lowercase 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:

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

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.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (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.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Large stones (in tables). Rock fragments that are 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

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).

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

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.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of the acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly 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.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

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.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

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 on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

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."

Thin layer (in tables). An otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1949-87 at Bastrop, Louisiana)

Month	Temperature						Precipitation			
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more
	°F	°F	°F	°F	°F	Units	In	In	In	
January-----	56.8	35.9	46.4	80	11	94	4.80	2.31	6.96	6
February----	61.2	38.9	50.0	82	17	115	4.96	2.71	6.95	6
March-------	69.4	46.2	57.8	88	25	265	5.46	2.98	7.66	7
April-------	77.7	54.7	66.2	90	35	468	5.05	2.68	7.13	6
May---------	85.2	62.2	73.7	95	46	695	5.21	2.44	7.60	6
June--------	91.7	69.3	80.5	100	54	840	4.11	1.59	6.23	5
July--------	94.4	72.2	83.3	102	61	961	3.94	1.96	5.66	6
August------	93.8	70.9	82.3	102	58	957	3.33	1.34	5.01	4
September---	88.4	65.2	76.8	100	46	752	3.28	1.45	4.84	5
October-----	79.6	54.2	66.9	94	34	482	3.39	0.98	5.49	4
November----	68.1	44.7	56.4	85	23	226	4.31	2.20	6.35	5
December----	59.4	38.1	48.8	80	16	101	5.16	2.23	7.66	6
Yearly:										
Average---	77.1	54.4	65.7	---	---	---	---	---	---	---
Extreme---	110	4	---	104	10	---	---	---	---	---
Total-----	---	---	---	---	---	5,956	53.00	42.89	62.15	66

* 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 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1961-87 at Bastrop, Louisiana)

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--	Mar. 6	Mar. 16	Mar. 30
2 years in 10 later than--	Feb. 27	Mar. 9	Mar. 24
5 years in 10 later than--	Feb. 10	Feb. 25	Mar. 12
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 18	Nov. 7	Oct. 26
2 years in 10 earlier than--	Nov. 25	Nov. 12	Nov. 1
5 years in 10 earlier than--	Dec. 8	Nov. 22	Nov. 12

TABLE 3.--GROWING SEASON

(Recorded in the period 1957-87 at Bastrop, Louisiana)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	245	233	209
8 years in 10	258	242	220
5 years in 10	281	260	240
2 years in 10	305	278	260
1 year in 10	318	288	271

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
An	Angie very fine sandy loam, 1 to 5 percent slopes	6,000	1.0
Ba	Betis loamy fine sand, 1 to 5 percent slopes	800	0.1
Be	Bienville loamy fine sand, 1 to 3 percent slopes	6,500	1.1
Bh	Bowie fine sandy loam, 1 to 5 percent slopes	1,300	0.2
Bo	Boykin loamy fine sand, 1 to 5 percent slopes	1,200	0.2
Br	Briley loamy fine sand, 1 to 5 percent slopes	1,900	0.3
Ca	Cahaba fine sandy loam, 1 to 5 percent slopes	3,500	0.6
Dk	Darley gravelly fine sandy loam, 1 to 5 percent slopes	6,100	1.1
DM	Darley gravelly fine sandy loam, 5 to 12 percent slopes	54,900	9.6
DO	Darley gravelly fine sandy loam, 12 to 30 percent slopes	33,800	5.8
ED	Eastwood very fine sandy loam, 5 to 12 percent slopes	200	*
Fr	Frizzell silt loam	13,100	2.3
Gm	Groom silt loam, occassionally flooded	10,400	1.8
GO	Groom silty clay loam, frequently flooded	9,900	1.7
Gu	Guyton silt loam	2,900	0.5
GY	Guyton silt loam, frequently flooded	43,200	7.6
GZ	Guyton-Ouachita silt loams, frequently flooded	9,400	1.6
HA	Haggerty fine sandy loam, frequently flooded	1,400	0.2
HB	Haggerty silty clay loam, frequently flooded	1,100	0.2
Hd	Harleston fine sandy loam, 1 to 3 percent slopes	4,900	0.8
He	Hebert silt loam, occasionally flooded	600	0.1
HP	Hebert-Perry soils, frequently flooded	900	0.2
ID	Iuka-Ochlockonee complex, frequently flooded	47,200	8.2
Kn	Kirvin fine sandy loam, 1 to 5 percent slopes	15,200	2.6
KR	Kirvin fine sandy loam, 5 to 12 percent slopes	20,100	3.5
Le	Libuse silt loam, 1 to 5 percent slopes	16,500	2.9
LF	Libuse silt loam, 5 to 8 percent slopes	2,200	0.4
LT	Litro clay, frequently flooded	17,400	3.0
Ma	Mahan fine sandy loam, 1 to 5 percent slopes	10,500	1.8
MH	Mahan fine sandy loam, 5 to 12 percent slopes	4,800	0.8
Mn	Malbis fine sandy loam, 1 to 5 percent slopes	21,400	3.7
Mr	McLaurin fine sandy loam, 1 to 5 percent slopes	4,100	0.7
Or	Ora fine sandy loam, 1 to 5 percent slopes	6,500	1.1
OS	Ora fine sandy loam, 5 to 12 percent slopes	1,900	0.3
PF	Perry clay, frequently flooded	5,500	1.0
Po	Portland silty clay loam, occasionally flooded	1,400	0.2
PR	Portland clay, frequently flooded	1,900	0.3
Rs	Ruston fine sandy loam, 1 to 5 percent slopes	60,700	10.6
Sa	Sacul very fine sandy loam, 1 to 5 percent slopes	18,200	3.1
SB	Sacul very fine sandy loam, 5 to 12 percent slopes	27,400	4.7
Sg	Savannah fine sandy loam, 1 to 5 percent slopes	13,500	2.3
SH	Savannah fine sandy loam, 5 to 12 percent slopes	1,300	0.2
Sk	Sawyer silt loam, 1 to 5 percent slopes	10,600	1.8
SL	Sawyer silt loam, 5 to 8 percent slopes	2,800	0.5
SM	Smithdale fine sandy loam, 8 to 15 percent slopes	21,600	3.7
So	Smithton fine sandy loam, 0 to 2 percent slopes	4,800	0.8
St	Sterlington very fine sandy loam, 1 to 3 percent slopes	800	0.1
Tr	Trep loamy fine sand, 1 to 5 percent slopes	3,200	0.6
Wc	Warnock fine sandy loam, 1 to 5 percent slopes	6,300	1.1
Wr	Wrightsville silt loam, occasionally flooded	900	0.2
	Water	16,200	2.8
	Total	578,900	100.0

* Less than 0.1 percent.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(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	Land capability	Cotton	Corn	Bahiagrass	Common bermudagrass	Improved bermudagrass
		Lbs	Bu	AUM*	AUM*	AUM*
An-- Angie	IIIe	400	75	7.5	5.0	12.0
Ba-- Betis	IIIs	---	---	6.0	5.0	9.5
Be-- Bienville	IIs	400	80	6.5	7.0	11.0
Bh-- Bowie	IIIe	450	80	9	8	12
Bo-- Boykin	IIIs	---	---	8.0	6.0	10.0
Br-- Briley	IIIs	---	60	6.5	6.0	10.0
Ca-- Cahaba	IIe	750	85	8.0	6.5	11.0
Dk-- Darley	IIIe	650	50	7	6.0	12
DM, DO-- Darley	VIe	---	---	5	5.0	10
ED-- Eastwood	VIe	---	---	5.5	5.5	6.5
Fr-- Frizzell	IIw	450	85	7.0	5.0	10.5
Gm-- Groom	IVw	---	---	5.5	4.0	---
GO-- Groom	Vw	---	---	---	---	---
Gu-- Guyton	IIIw	---	---	6.5	5.0	---
GY-- Guyton	Vw	---	---	---	4.0	---
GZ**:						
Guyton--	Vw	---	---	---	4.0	---
Ouachita--	Vw	---	---	7.0	7.0	---
HA, HB-- Haggerty	Vw	---	---	---	5.0	---
Hd-- Harleston	IIe	650	85	8.5	6.5	10.5

See footnote at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Cotton	Corn	Bahiagrass	Common bermudagrass	Improved bermudagrass
		Lbs	Bu	AUM*	AUM*	AUM*
He------------------------ Hebert	IIIw	550	70	7.0	6.5	10.0
HP**:						
Hebert-------------------	Vw	---	---	---	5.0	---
Perry--------------------	Vw	---	---	---	5.0	---
ID*:						
Iuka---------------------	Vw	---	---	7.0	5.5	---
Ochlockonee--------------	Vw	---	---	7.5	6.0	---
Kn------------------------ Kirvin	IIIe	---	75	8	7.0	10.0
KR------------------------ Kirvin	VIe	---	---	6	6	7
Le------------------------ Libuse	IIIe	550	85	7.5	5.5	12.0
LF------------------------ Libuse	IVe	---	---	7.0	5.0	11.5
LT------------------------ Litro	Vw	---	---	---	4.0	---
Ma------------------------ Mahan	IIIe	550	70	7	6.5	9
MH------------------------ Mahan	VIe	---	---	6	6.0	8
Mn------------------------ Malbis	IIIe	750	85	8.5	6.5	9.5
Mr------------------------ McLaurin	IIe	600	75	8.0	5.0	10.0
Or------------------------ Ora	IIe	700	80	9.0	6.0	8.5
OS------------------------ Ora	IVe	---	---	8.0	5.0	7.0
PF------------------------ Perry	Vw	---	---	---	5.0	---
Po------------------------ Portland	IVw	---	---	---	6.5	---
PR------------------------ Portland	Vw	---	---	---	6.0	---
Rs------------------------ Ruston	IIIe	600	75	9.5	5.5	12.0
Sa------------------------ Sacul	IVe	---	---	7.5	6.5	7.5

See footnote at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Cotton	Corn	Bahiagrass	Common bermudagrass	Improved bermudagrass
		Lbs	Bu	AUM*	AUM*	AUM*
SB----------------------- Sacul	VIe	---	---	6.5	5.5	7.0
Sg----------------------- Savannah	IIe	650	75	9.0	6.5	11.0
SH----------------------- Savannah	IVe	---	---	7.0	6.0	7.0
Sk, SL------------------- Sawyer	IIIe	500	70	7.0	6.0	9
SM----------------------- Smithdale	VIe	---	---	8.0	5.0	9.0
So----------------------- Smithton	IIIw	450	70	7.5	7.0	8.0
St----------------------- Sterlington	IIe	825	85	8.0	7.0	15.5
Tr----------------------- Trep	IIIs	400	65	6.0	6.0	9.0
Wc----------------------- Warnock	IIIe	650	75	7	7	9.5
Wr----------------------- Wrightsville	IVw	---	---	7.0	6.5	---

* 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.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--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	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
An-------------- Angie	9W	Slight	Moderate	Slight	Severe	Loblolly pine-------	86	9	Loblolly pine.
						Shortleaf pine------	---	---	
						Sweetgum-----------	---	---	
Ba-------------- Betis	7S	Slight	Moderate	Severe	Slight	Shortleaf pine------	63	7	Loblolly pine.
						Loblolly pine-------	70	6	
Be-------------- Bienville	10S	Slight	Severe	Moderate	Slight	Loblolly pine-------	96	10	Loblolly pine.
						Longleaf pine-------	88	8	
						Shortleaf pine------	75	8	
Bh-------------- Bowie	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	86	9	Loblolly pine.
						Shortleaf pine------	80	9	
						Sweetgum-----------	---	---	
						Hickory------------	---	---	
						Southern red oak----	---	---	
Bo-------------- Boykin	10S	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	92	10	Loblolly pine.
						Shortleaf pine------	76	8	
						Longleaf pine-------	---	---	
Br-------------- Briley	8S	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	80	8	Loblolly pine.
						Shortleaf pine------	70	8	
						Longleaf pine-------	---	---	
Ca-------------- Cahaba	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	87	9	Loblolly pine, water oak.
						Shortleaf pine------	70	8	
						Yellow-poplar-------	---	---	
						Sweetgum-----------	90	7	
						Southern red oak----	---	---	
						Water oak----------	---	---	
Dk, DM---------- Darley	8F	Slight	Slight	Slight	Moderate	Loblolly pine-------	85	8	Loblolly pine.
						Shortleaf pine------	75	8	
						Hickory------------	---	---	
						Southern red oak----	---	---	
						White oak----------	---	---	
						Sweetgum-----------	---	---	
DO-------------- Darley	8R	Moderate	Moderate	Slight	Moderate	Loblolly pine-------	85	8	Loblolly pine.
						Shortleaf pine------	75	8	
						Hickory------------	---	---	
						Southern red oak----	---	---	
						White oak----------	---	---	
						Sweetgum-----------	---	---	
ED-------------- Eastwood	9C	Slight	Moderate	Slight	Slight	Loblolly pine-------	86	9	Loblolly pine.
						Shortleaf pine------	77	9	
						Sweetgum-----------	---	---	
						Southern red oak----	---	---	
						Hickory------------	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
Fr-------------- Frizzell	9W	Slight	Moderate	Slight	Severe	Loblolly pine-------	90	9	Loblolly pine, water oak, Shumard oak.
						Sweetgum-----------	90	7	
						Water oak-----------	---	---	
Gm-------------- Groom	5W	Slight	Moderate	Moderate	Severe	Willow oak----------	80	5	Green ash, Nuttall oak, loblolly pine, water oak.
						Water oak-----------	80	5	
						Loblolly pine-------	80	8	
						Sweetgum-----------	80	6	
						Cherrybark oak------	80	6	
						Persimmon-----------	---	---	
GO-------------- Groom	5W	Slight	Moderate	Moderate	Severe	Green ash-----------	95	5	Green ash, Nuttall oak, American sycamore.
						Sweetgum-----------	80	6	
						Overcup oak---------	75	5	
						Honeylocust---------	---	---	
						Sugarberry----------	---	---	
Gu-------------- Guyton	8W	Slight	Severe	Moderate	Severe	Loblolly pine-------	85	8	Loblolly pine, water oak, green ash.
						Sweetgum-----------	---	---	
						Green ash-----------	---	---	
						Cherrybark oak------	---	---	
						Water oak-----------	---	---	
						Willow oak----------	78	5	
GY-------------- Guyton	6W	Slight	Severe	Severe	Severe	Green ash-----------	100	6	Nuttall oak, green ash.
						Sweetgum-----------	---	---	
						Black willow--------	---	---	
						Nuttall oak---------	---	---	
						Eastern cottonwood--	---	---	
						Sugarberry----------	---	---	
						Loblolly pine-------	95	10	
GZ**:									
Guyton---------	6W	Slight	Severe	Severe	Severe	Green ash-----------	100	6	Nuttall oak, green ash.
						Sweetgum-----------	---	---	
						Black willow--------	---	---	
						Nuttall oak---------	---	---	
						Eastern cottonwood--	---	---	
						Sugarberry----------	---	---	
						Loblolly pine-------	95	10	
Ouachita-------	11W	Slight	Slight	Moderate	Severe	Loblolly pine-------	100	11	Loblolly pine, Nuttall oak.
						Sweetgum-----------	100	10	
						Eastern cottonwood--	100	9	
						Cherrybark oak------	100	10	
HA, HB---------- Haggerty	2W	Slight	Severe	Severe	Moderate	Water oak-----------	50	2	Green ash.
						Green ash-----------	---	---	
						Baldcypress---------	---	---	
						Persimmon-----------	---	---	
						Water tupelo--------	---	---	
Hd-------------- Harleston	9W	Slight	Slight	Slight	Moderate	Loblolly pine-------	90	9	Loblolly pine.
						Shortleaf pine------	80	9	
						Sweetgum-----------	75	5	
						Honeylocust---------	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordi-nation symbol	Management concerns: Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Plant competi-tion	Potential productivity: Common trees	Site index	Produc-tivity class*	Trees to plant
He-------------- Hebert	8W	Slight	Moderate	Moderate	Severe	Eastern cottonwood--	95	8	Water oak, cherrybark oak, Shumard oak.
						Cherrybark oak------	95	9	
						Nuttall oak---------	90	---	
						Sweetgum------------	90	7	
						Water oak-----------	---	---	
						American sycamore---	90	6	
						Green ash-----------	---	---	
HP**:									
Hebert---------	7W	Slight	Severe	Severe	Moderate	Eastern cottonwood--	90	7	Nuttall oak, green ash.
						Green ash-----------	---	---	
						Overcup oak---------	---	7	
						Water hickory-------	---	---	
						American sycamore---	---	---	
Perry----------	2W	Slight	Severe	Severe	Moderate	Green ash-----------	70	2	Green ash, baldcypress.
						Water hickory-------	---	---	
						Sweetgum------------	70	4	
						Overcup oak---------	---	---	
						Baldcypress---------	---	---	
						Black willow--------	---	---	
ID**:									
Iuka-----------	9W	Slight	Moderate	Moderate	Severe	Loblolly pine-------	100	9	Loblolly pine, Nuttall oak.
						Sweetgum------------	100	10	
						Eastern cottonwood--	105	10	
						Water oak-----------	100	7	
Ochlockonee----	4W	Slight	Moderate	Moderate	Moderate	Southern red oak	80	4	Loblolly pine, Nuttall oak.
						Green ash-----------	---	---	
						Hickory-------------	---	---	
						Sweetgum------------	90	7	
Kn, KR---------- Kirvin	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	85	8	Loblolly pine.
						Shortleaf pine------	75	8	
						Sweetgum------------	---	---	
						Hickory-------------	---	---	
Le, LF---------- Libuse	8A	Slight	Slight	Slight	Moderate	Loblolly pine-------	83	8	Loblolly pine.
						Shortleaf pine------	77	9	
						Sweetgum------------	80	6	
						Southern red oak----	---	---	
						Hickory-------------	---	---	
						White oak-----------	---	---	
LT-------------- Litro	3W	Slight	Severe	Severe	Moderate	Baldcypress---------	75	3	Green ash, baldcypress.
						Overcup oak---------	75	---	
						Water hickory-------	70	3	
						Honeylocust---------	70	---	
						Water tupelo--------	60	6	
						Persimmon-----------	70	---	
Ma, MH---------- Mahan	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	90	9	Loblolly pine.
						Shortleaf pine------	---	---	
						Hickory-------------	---	---	
						Southern red oak----	---	---	
						Sweetgum------------	---	---	
						White oak-----------	---	---	
						Post oak------------	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordi-nation symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Plant competi-tion	Common trees	Site index	Produc-tivity class*	
Mn-------------- Malbis	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	90	9	Loblolly pine.
						Longleaf pine-------	80	7	
						Sweetgum------------	---	---	
						Southern red oak----	---	---	
Mr-------------- McLaurin	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	83	8	Loblolly pine.
						Shortleaf pine------	70	8	
						Sweetgum------------	---	---	
Or, OS---------- Ora	8W	Slight	Slight	Slight	Moderate	Loblolly pine-------	83	8	Loblolly pine, slash pine.
						Shortleaf pine------	69	8	
						Sweetgum------------	80	6	
PF-------------- Perry	2W	Slight	Severe	Severe	Moderate	Green ash-----------	70	2	Green ash, baldcypress.
						Water hickory-------	---	---	
						Sweetgum------------	70	4	
						Overcup oak---------	---	---	
						Baldcypress---------	---	---	
						Black willow--------	---	---	
Po, PR---------- Portland	6W	Slight	Moderate	Severe	Severe	Water oak-----------	85	6	Water oak, Nuttall oak, baldcypress.
						Nuttall oak---------	85	7	
						Green ash-----------	70	3	
						Eastern cottonwood--	90	7	
						Sweetgum------------	80	6	
Rs-------------- Ruston	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	84	8	Loblolly pine.
						Shortleaf pine------	75	8	
						Southern red oak----	---	---	
						Post oak------------	---	---	
						Sweetgum------------	---	---	
						Hickory-------------	---	---	
Sa, SB---------- Sacul	8C	Slight	Moderate	Slight	Moderate	Loblolly pine-------	84	8	Loblolly pine.
						Shortleaf pine------	74	8	
						Sweetgum------------	---	--	
Sg, SH---------- Savannah	8W	Slight	Moderate	Slight	Moderate	Loblolly pine-------	81	8	Loblolly pine.
						Shortleaf pine------	76	8	
						Southern red oak----	75	4	
						Sweetgum------------	---	---	
Sk, SL---------- Sawyer	8W	Slight	Slight	Slight	Moderate	Loblolly pine-------	85	8	Loblolly pine.
						Shortleaf pine------	75	8	
						Sweetgum------------	---	---	
SM-------------- Smithdale	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	80	8	Loblolly pine.
						Shortleaf pine------	---	---	
						Sweetgum------------	---	---	
						Post oak------------	---	---	
So-------------- Smithton	9W	Slight	Moderate	Moderate	Severe	Loblolly pine-------	86	9	Loblolly pine, cherrybark oak, Shumard oak.
						Shortleaf pine------	76	8	
						Sweetgum------------	86	7	
						Cherrybark oak------	85	7	
						Water oak-----------	85	6	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
St------------ Sterlington	3A	Slight	Slight	Slight	Moderate	Green ash-----------	75	3	Water oak, cherrybark oak, Shumard oak.
						Eastern cottonwood--	---	---	
						Cherrybark oak------	95	9	
						Water oak-----------	90	6	
						Pecan---------------	---	---	
						Sweetgum------------	90	7	
Tr------------ Trep	9S	Slight	Slight	Moderate	Moderate	Loblolly pine-------	90	9	Loblolly pine.
						Shortleaf pine------	80	9	
Wc------------ Warnock	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	86	9	Loblolly pine.
						Shortleaf pine------	77	9	
Wr------------ Wrightsville	4W	Slight	Moderate	Severe	Severe	Water oak-----------	70	4	Loblolly pine, water oak, Nuttall oak.
						Sweetgum------------	70	4	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--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
An-------------------- Angie	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
Ba-------------------- Betis	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Moderate: droughty, too sandy.
Be-------------------- Bienville	Severe: flooding.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Bh-------------------- Bowie	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
Bo-------------------- Boykin	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Slight.
Br-------------------- Briley	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Ca-------------------- Cahaba	Severe: flooding.	Slight----------	Moderate: slope.	Slight----------	Slight.
Dk-------------------- Darley	Severe: small stones.	Severe: small stones.	Severe: small stones.	Slight----------	Severe: small stones.
DM-------------------- Darley	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight----------	Severe: small stones.
DO-------------------- Darley	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, slope.
ED-------------------- Eastwood	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope.
Fr-------------------- Frizzell	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
Gm-------------------- Groom	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
GO-------------------- Groom	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Gu-------------------- Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GY-------------------- Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
GZ*:					
Guyton---------------	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Ouachita-------------	Severe: flooding.	Moderate: flooding, percs slowly.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
HA, HB---------------- Haggerty	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Hd-------------------- Harleston	Severe: flooding.	Moderate: wetness.	Moderate: slope, wetness.	Slight----------	Slight.
He-------------------- Hebert	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
HP*:					
Hebert---------------	Severe: flooding.	Moderate: flooding, wetness, percs slowly.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
Perry----------------	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
ID*:					
Iuka-----------------	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
Ochlockonee----------	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Kn-------------------- Kirvin	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
KR-------------------- Kirvin	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Le-------------------- Libuse	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight----------	Moderate: wetness.
LF-------------------- Libuse	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LT: Litro	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, flooding.	Severe: wetness, too clayey.	Severe: wetness, flooding, too clayey.
Ma: Mahan	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
MH: Mahan	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Mn: Malbis	Slight	Slight	Moderate: slope.	Slight	Slight.
Mr: McLaurin	Slight	Slight	Moderate: slope.	Slight	Slight.
Or: Ora	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Moderate: droughty.
OS: Ora	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Slight	Moderate: droughty, slope.
PF: Perry	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, flooding.	Severe: wetness, too clayey.	Severe: wetness, flooding, too clayey.
Po: Portland	Severe: flooding, wetness, percs slowly.	Severe: percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
PR: Portland	Severe: flooding, wetness, percs slowly.	Severe: too clayey, percs slowly.	Severe: too clayey, flooding.	Severe: too clayey.	Severe: flooding, too clayey.
Rs: Ruston	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Sa: Sacul	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Slight	Slight.
SB: Sacul	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Slight	Moderate: slope.
Sg: Savannah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, droughty.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SH-------------------- Savannah	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: wetness, droughty, slope.
Sk-------------------- Sawyer	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Slight.
SL-------------------- Sawyer	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Slight.
SM-------------------- Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
So-------------------- Smithton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
St-------------------- Sterlington	Severe: flooding.	Slight----------	Moderate: slope.	Slight----------	Slight.
Tr-------------------- Trep	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Wc-------------------- Warnock	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Moderate: droughty.
Wr-------------------- Wrightsville	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

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	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
An----------------- Angie	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ba----------------- Betis	Poor	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Be----------------- Bienville	Fair	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Bh----------------- Bowie	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Bo----------------- Boykin	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Br----------------- Briley	Poor	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Ca----------------- Cahaba	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Dk----------------- Darley	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
DM, DO------------- Darley	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
ED----------------- Eastwood	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Fr----------------- Frizzell	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Gm, GO------------- Groom	Poor	Fair	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair.
Gu----------------- Guyton	Fair	Fair	Fair	Fair	Fair	Good	Good	Good	Fair	Fair	Good.
GY----------------- Guyton	Poor	Fair	Fair	Fair	Fair	Poor	Good	Good	Poor	Fair	Good.
GZ*:											
Guyton------------	Poor	Fair	Fair	Fair	Fair	Poor	Good	Good	Poor	Fair	Good.
Ouachita----------	Poor	Fair	Fair	Good	Poor	Fair	Good	Fair	Fair	Good	Fair.
HA, HB------------- Haggerty	Poor	Fair	Fair	Fair	Poor	Poor	Fair	Very poor.	Fair	Fair	Very poor.
Hd----------------- Harleston	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
He----------------- Hebert	Fair	Fair	Good	Good	Poor	Good	Fair	Fair	Fair	Good	Fair.

See footnote at end of table.

TABLE 8.--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	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
HP*:											
Hebert	Poor	Fair	Fair	Good	Very poor.	Fair	Good	Fair	Poor	Fair	Good.
Perry	Poor	Poor	Fair	Fair	---	Fair	Fair	Fair	Poor	Fair	Fair.
ID*:											
Iuka	Poor	Fair	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
Ochlockonee	Poor	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Kn Kirvin	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
KR Kirvin	Poor	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Le Libuse	Good	Good	Good	Fair	Good	Good	Poor	Poor	Good	Good	Poor.
LF Libuse	Fair	Good	Good	Fair	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LT Litro	Poor	Fair	Fair	Fair	---	Fair	Good	Good	Poor	Fair	Good.
Ma Mahan	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MH Mahan	Poor	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Mn Malbis	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Mr McLaurin	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Or Ora	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
OS Ora	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PF Perry	Poor	Poor	Fair	Fair	---	Fair	Fair	Fair	Poor	Fair	Fair.
Po Portland	Good	Good	Good	Good	---	Good	Good	Good	Good	Good	Good.
PR Portland	Poor	Fair	Fair	Good	---	Fair	Good	Good	Fair	Good	Good.
Rs Ruston	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Sa Sacul	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
SB----------------- Sacul	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Sg----------------- Savannah	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SH----------------- Savannah	Fair	Good	Good	Fair	Fair	Good	Very poor.	Very poor.	Good	Good	Very poor.
Sk----------------- Sawyer	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
SL----------------- Sawyer	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SM----------------- Smithdale	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
So----------------- Smithton	Poor	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
St----------------- Sterlington	Good	Good	Good	Good	Fair	Good	Poor	Very poor.	Good	Good	Very poor.
Tr----------------- Trep	Poor	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Wc----------------- Warnock	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Wr----------------- Wrightsville	Fair	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
An-Angie	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
Ba-Betis	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: droughty, too sandy.
Be-Bienville	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.
Bh-Bowie	Moderate: wetness.	Slight	Slight	Moderate: low strength.	Slight.
Bo-Boykin	Slight	Slight	Slight	Slight	Slight.
Br-Briley	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: droughty.
Ca-Cahaba	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
Dk-Darley	Moderate: cemented pan, too clayey.	Slight	Slight	Slight	Severe: small stones.
DM-Darley	Moderate: cemented pan, too clayey, slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones.
DO-Darley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
ED-Eastwood	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
Fr-Frizzell	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Gm-Groom	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
GO-Groom	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Gu----------------- Guyton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
GY----------------- Guyton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
GZ*:					
Guyton-----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Ouachita---------	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
HA, HB------------ Haggerty	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Hd----------------- Harleston	Severe: wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, flooding.	Slight.
He----------------- Hebert	Severe: wetness.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: wetness, flooding.
HP*:					
Hebert-----------	Severe: wetness.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
Perry------------	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, flooding.
ID*:					
Iuka-------------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
Ochlockonee------	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Kn----------------- Kirvin	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
KR----------------- Kirvin	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Le----------------- Libuse	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
LF----------------- Libuse	Severe: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Severe: low strength.	Moderate: wetness.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LT: Litro	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness, flooding, too clayey.
Ma: Mahan	Moderate: too clayey.	Slight	Slight	Moderate: low strength.	Slight.
MH: Mahan	Moderate: too clayey, slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
Mn: Malbis	Moderate: wetness.	Slight	Slight	Slight	Slight.
Mr: McLaurin	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
Or: Ora	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: droughty.
OS: Ora	Severe: wetness.	Moderate: wetness, slope.	Severe: slope.	Moderate: low strength, wetness, slope.	Moderate: droughty, slope.
PF: Perry	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, flooding, too clayey.
Po: Portland	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: wetness, flooding.
PR: Portland	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Severe: flooding, too clayey.
Rs: Ruston	Severe: cutbanks cave.	Slight	Slight	Moderate: low strength.	Slight.
Sa: Sacul	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
SB: Sacul	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
Sg: Savannah	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: wetness, droughty.
SH: Savannah	Severe: wetness.	Moderate: wetness, slope.	Severe: slope.	Moderate: low strength, wetness, slope.	Moderate: wetness, droughty, slope.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Sk---------------- Sawyer	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.
SL---------------- Sawyer	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Slight.
SM---------------- Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
So---------------- Smithton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
St---------------- Sterlington	Slight-----------	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
Tr---------------- Trep	Severe: cutbanks cave.	Slight-----------	Slight-----------	Moderate: low strength.	Moderate: droughty.
Wc---------------- Warnock	Moderate: wetness.	Slight-----------	Slight-----------	Slight-----------	Moderate: droughty.
Wr---------------- Wrightsville	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
An-----------------Angie	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Ba-----------------Betis	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
Be-----------------Bienville	Moderate: flooding, wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: too sandy.
Bh-----------------Bowie	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
Bo-----------------Boykin	Slight-----------	Moderate: seepage, slope.	Slight-----------	Slight-----------	Good.
Br-----------------Briley	Slight-----------	Moderate: seepage, slope.	Slight-----------	Severe: seepage.	Good.
Ca-----------------Cahaba	Moderate: flooding.	Severe: seepage.	Severe: seepage.	Moderate: flooding.	Fair: thin layer.
Dk-----------------Darley	Severe: cemented pan, percs slowly.	Severe: seepage, cemented pan.	Moderate: cemented pan, too clayey.	Severe: cemented pan.	Poor: cemented pan, small stones.
DM-----------------Darley	Severe: cemented pan, percs slowly.	Severe: seepage, cemented pan, slope.	Moderate: cemented pan, slope, too clayey.	Severe: cemented pan.	Poor: cemented pan, small stones.
DO-----------------Darley	Severe: cemented pan, percs slowly, slope.	Severe: seepage, cemented pan, slope.	Severe: slope.	Severe: cemented pan, slope.	Poor: cemented pan, small stones, slope.
ED-----------------Eastwood	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Fr-----------------Frizzell	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Gm, GO-------------Groom	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 10.--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
Gu------------------ Guyton	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
GY------------------ Guyton	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
GZ*:					
Guyton-------------	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Ouachita-----------	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, seepage.	Severe: flooding.	Fair: too clayey.
HA------------------ Haggerty	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.
HB------------------ Haggerty	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, thin layer.
Hd------------------ Harleston	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
He------------------ Hebert	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
HP*:					
Hebert-------------	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
Perry--------------	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
ID*:					
Iuka---------------	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Ochlockonee--------	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: wetness.
Kn------------------ Kirvin	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight-----------	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 10.--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
KR------------------ Kirvin	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Le, LF-------------- Libuse	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
LT------------------ Litro	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Ma------------------ Mahan	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey, hard to pack.
MH------------------ Mahan	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
Mn------------------ Malbis	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
Mr------------------ McLaurin	Slight-----------	Severe: seepage.	Slight-----------	Severe: seepage.	Good.
Or------------------ Ora	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
OS------------------ Ora	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: slope, wetness.
PF------------------ Perry	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Po, PR-------------- Portland	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Rs------------------ Ruston	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey.
Sa------------------ Sacul	Severe: wetness, percs slowly.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
SB------------------ Sacul	Severe: wetness, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
Sg------------------ Savannah	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.

See footnote at end of table.

TABLE 10.--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
SH------------------ Savannah	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
Sk, SL-------------- Sawyer	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Poor: thin layer.
SM------------------ Smithdale	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
So------------------ Smithton	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
St------------------ Sterlington	Moderate: flooding.	Moderate: seepage, slope.	Moderate: flooding.	Moderate: flooding.	Good.
Tr------------------ Trep	Severe: wetness, percs slowly.	Severe: seepage.	Moderate: wetness.	Severe: seepage.	Poor: thin layer.
Wc------------------ Warnock	Moderate: wetness, percs slowly.	Severe: seepage.	Moderate: too clayey.	Slight-----------	Fair: too clayey.
Wr------------------ Wrightsville	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
An-------------------- Angie	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Ba-------------------- Betis	Good-----------------	Improbable: thin layer.	Improbable: too sandy.	Fair: too sandy.
Be-------------------- Bienville	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
Bh-------------------- Bowie	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Bo-------------------- Boykin	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Br-------------------- Briley	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Ca-------------------- Cahaba	Good-----------------	Probable-------------	Improbable: too sandy.	Fair: too clayey.
Dk, DM---------------- Darley	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
DO-------------------- Darley	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
ED-------------------- Eastwood	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Fr-------------------- Frizzell	Fair: thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Gm, GO---------------- Groom	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Gu, GY---------------- Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
GZ*:				
Guyton---------------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ouachita-------------	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
HA, HB----------------- Haggerty	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: wetness.
Hd--------------------- Harleston	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
He--------------------- Hebert	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
HP*:				
Hebert----------------	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Perry-----------------	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
ID*:				
Iuka------------------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ochlockonee-----------	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
Kn, KR----------------- Kirvin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Le, LF----------------- Libuse	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
LT--------------------- Litro	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Ma, MH----------------- Mahan	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Mn--------------------- Malbis	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Mr--------------------- McLaurin	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Or--------------------- Ora	Fair: low strength, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
OS--------------------- Ora	Fair: low strength, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
PF: Perry	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Po, PR: Portland	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Rs: Ruston	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Sa, SB: Sacul	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Sg: Savannah	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
SH: Savannah	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Sk, SL: Sawyer	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
SM: Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
So: Smithton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
St: Sterlington	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Tr: Trep	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
Wc: Warnock	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Wr: Wrightsville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
An: Angie	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: slow refill.	Deep to water	Slope, percs slowly.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Ba: Betis	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Favorable	Droughty.
Be: Bienville	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Bh: Bowie	Severe: slow refill.	Moderate: piping, wetness.	Severe: slow refill.	Deep to water	Slope	Favorable	Rooting depth.
Bo: Boykin	Moderate: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Slope, fast intake, soil blowing.	Soil blowing	Favorable.
Br: Briley	Moderate: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Soil blowing	Droughty.
Ca: Cahaba	Severe: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
Dk: Darley	Moderate: seepage, cemented pan, slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Slope, droughty.	Cemented pan, soil blowing.	Droughty, cemented pan.
DM, DO: Darley	Severe: slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Slope, droughty.	Slope, cemented pan, soil blowing.	Slope, droughty, cemented pan.
ED: Eastwood	Slight	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Fr: Frizzell	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Erodes easily, percs slowly.
Gm: Groom	Slight	Severe: wetness.	Severe: slow refill.	Flooding	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
GO: Groom	Slight	Severe: wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily, percs slowly.
Gu: Guyton	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
GY: Guyton	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
GZ*:							
Guyton	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Ouachita	Slight	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
HA: Haggerty	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
HB: Haggerty	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Percs slowly, flooding, cutbanks cave.	Wetness, percs slowly.	Wetness	Wetness, percs slowly.
Hd: Harleston	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Favorable	Wetness	Wetness	Favorable.
He: Hebert	Moderate: seepage.	Severe: thin layer, wetness.	Severe: slow refill.	Flooding	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
HP*:							
Hebert	Moderate: seepage.	Severe: thin layer, wetness.	Severe: slow refill.	Flooding	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Perry	Slight	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
ID*: Iuka	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding	Wetness, flooding.	Wetness	Wetness.
Ochlockonee	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Flooding	Favorable	Favorable.
Kn: Kirvin	Slight	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
KR: Kirvin	Slight	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
Le, LF: Libuse	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
LT: Litro	Slight	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Ma: Mahan	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, soil blowing.	Soil blowing	Favorable.
MH: Mahan	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, soil blowing.	Slope, soil blowing.	Slope.
Mn: Malbis	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
Mr: McLaurin	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
Or: Ora	Moderate: seepage, slope.	Moderate: piping, wetness.	Severe: no water.	Slope	Slope, wetness, droughty.	Erodes easily, wetness.	Erodes easily, droughty.
OS: Ora	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Slope	Slope, wetness, droughty.	Slope, erodes easily, wetness.	Slope, erodes easily, droughty.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
PF----------------- Perry	Slight---------	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Po----------------- Portland	Moderate: seepage.	Severe: hard to pack.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
PR----------------- Portland	Moderate: seepage.	Severe: hard to pack.	Severe: no water.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Rs----------------- Ruston	Moderate: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, soil blowing.	Soil blowing---	Favorable.
Sa----------------- Sacul	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness.	Wetness--------	Percs slowly.
SB----------------- Sacul	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness.	Slope, wetness.	Slope, percs slowly.
Sg----------------- Savannah	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Slope----------	Slope, wetness, droughty.	Wetness--------	Rooting depth.
SH----------------- Savannah	Severe: slope.	Severe: piping.	Severe: no water.	Slope----------	Slope, wetness, droughty.	Slope, wetness.	Slope, rooting depth.
Sk, SL------------ Sawyer	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly.
SM----------------- Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope----------	Slope----------	Slope.
So----------------- Smithton	Slight---------	Severe: piping, wetness.	Severe: no water.	Favorable------	Wetness, soil blowing.	Erodes easily, wetness, soil blowing.	Wetness, erodes easily.
St----------------- Sterlington	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable------	Erodes easily	Erodes easily.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Tr----------------- Trep	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Soil blowing---	Droughty.
Wc----------------- Warnock	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty.	Soil blowing---	Droughty.
Wr----------------- Wrightsville	Slight---------	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--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		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
An-- Angie	0-11	Very fine sandy loam.	CL-ML, CL	A-4, A-6	95-100	90-100	85-100	60-90	15-38	5-22
	11-60	Silty clay loam, silty clay, clay.	CH, CL	A-7-6	95-100	90-100	85-100	75-95	41-55	18-29
Ba-- Betis	0-25	Loamy fine sand	SM, SP-SM	A-2	100	97-100	90-100	10-35	---	NP
	25-75	Loamy fine sand, fine sandy loam.	SM	A-2, A-4	100	97-100	90-100	25-50	---	NP
Be-- Bienville	0-12	Loamy fine sand	SM	A-2-4, A-4	100	100	90-100	15-50	<25	NP-5
	12-28	Loamy fine sand, fine sand.	SM	A-2-4, A-4	100	100	90-100	15-50	<25	NP-3
	28-60	Loamy fine sand, fine sandy loam, fine sand.	SM, ML	A-2-4, A-4	100	100	90-100	20-55	<25	NP-3
Bh-- Bowie	0-14	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-2-4, A-4	97-100	94-100	90-100	30-55	<25	NP-6
	14-34	Sandy clay loam, clay loam, fine sandy loam.	SC, CL	A-4, A-6	90-100	87-100	80-100	40-72	20-40	8-25
	34-60	Sandy clay loam, clay loam, fine sandy loam.	SC, CL	A-4, A-6, A-2	80-100	70-100	65-100	34-77	20-40	8-25
Bo-- Boykin	0-6	Loamy fine sand	SM	A-2-4, A-4	97-100	95-100	75-98	17-45	<25	NP-4
	6-24	Loamy fine sand	SM	A-2-4, A-4	97-100	95-100	70-98	17-45	<25	NP-4
	24-60	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6, A-7-6	95-100	95-100	80-98	36-55	22-45	8-30
Br-- Briley	0-4	Loamy fine sand	SM	A-2-4, A-4	95-100	95-100	80-100	17-45	<25	NP-4
	4-23	Loamy fine sand	SM	A-2-4, A-4	97-100	95-100	80-100	17-45	<25	NP-4
	23-60	Fine sandy loam, sandy clay loam, loam.	SC, CL	A-4, A-6	95-100	95-100	85-100	36-65	22-39	8-22
Ca-- Cahaba	0-10	Fine sandy loam	SM	A-4, A-2-4	95-100	95-100	65-90	30-45	---	NP
	10-37	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6	90-100	80-100	75-90	40-75	22-35	8-15
	37-68	Loamy fine sand, fine sandy loam, fine sand.	SM, SP-SM	A-2-4	95-100	90-100	60-85	10-35	---	NP
Dk-- Darley	0-13	Gravelly fine sandy loam.	SM, SC-SM, SC, GM	A-1-b, A-2-4, A-4	55-80	40-70	35-65	20-50	<20	NP-8
	13-45	Sandy clay, clay.	GC, SC, CL, CH	A-7-6, A-2-7	85-100	70-95	45-80	30-60	40-60	16-30
	45-60	Clay, gravelly clay, gravelly sandy clay.	GC, SC, CL, CH	A-7-6, A-2-7	40-70	35-60	30-60	25-55	40-60	16-30

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
DM--------------- Darley	0-12	Gravelly fine sandy loam.	SM, SC-SM, SC, GM	A-1-b, A-2-4, A-4	55-80	40-70	35-65	20-50	<20	NP-8
	12-35	Sandy clay, gravelly sandy clay, clay.	GC, SC, CL, CH	A-7-6, A-2-7	65-90	55-85	45-80	30-60	40-60	16-30
	35-60	Clay, gravelly clay, gravelly sandy clay.	GC, SC, CL, CH	A-7-6, A-2-7	40-70	35-60	30-60	25-55	40-60	16-30
DO--------------- Darley	0-10	Gravelly fine sandy loam.	SM, SC-SM, SC, GM	A-1-b, A-2-4, A-4	55-80	40-70	35-65	20-50	<20	NP-8
	10-26	Sandy clay, gravelly sandy clay, clay.	GC, SC, CL, CH	A-7-6, A-2-7	65-90	55-85	45-80	30-60	40-60	16-30
	26-45	Clay, gravelly clay, gravelly sandy clay.	GC, SC, CL, CH	A-7-6, A-2-7	40-70	35-60	30-60	25-55	40-60	16-30
	45-60	Sandy loam, fine sandy loam, gravelly sandy clay loam, sandy clay loam.	SC-SM, CL-ML, CL, SC	A-2-4, A-4, A-6, A-2-6	80-95	75-90	70-85	30-55	16-35	5-20
ED--------------- Eastwood	0-9	Very fine sandy loam.	CL, SC-SM, CL-ML, ML	A-4, A-6	98-100	98-100	95-100	40-89	20-37	3-20
	9-43	Clay, silty clay	CH, CL	A-7-6	100	95-100	90-100	70-98	40-75	25-48
	43-60	Clay loam, silty clay loam, loam.	CL, CH	A-6, A-7-6	100	95-100	90-100	55-99	35-65	15-45
	60-65	Stratified fine sandy loam to shaly silty clay loam.	CL, SC, CL-ML, SC-SM	A-6, A-4, A-7-6	95-100	95-100	90-100	40-98	25-68	5-44
Fr--------------- Frizzell	0-4	Silt loam--------	CL-ML, ML, CL	A-4	100	100	90-100	65-90	11-30	NP-10
	4-36	Silt loam, loam	CL-ML, ML, CL	A-4	100	100	90-100	65-90	11-30	NP-10
	36-60	Silty clay loam, silt loam, clay loam.	CL	A-6	100	100	90-100	70-95	31-40	11-19
Gm--------------- Groom	0-3	Silt loam--------	ML, CL-ML, CL	A-4	100	100	90-100	75-95	11-28	NP-10
	3-11	Silt loam, loam, very fine sandy loam.	CL, CL-ML, ML	A-4	100	100	90-100	75-95	11-28	NP-10
	11-60	Silty clay loam, loam, silt loam.	CL, CL-ML	A-6, A-4	100	100	95-100	80-95	15-40	7-33
GO--------------- Groom	0-6	Silty clay loam	CL	A-6, A-7-6	100	100	95-100	85-95	26-50	7-33
	6-16	Silt loam, loam, very fine sandy loam.	CL, CL-ML, ML	A-4	100	100	90-100	75-95	11-28	NP-10
	16-60	Silty clay loam, loam, silt loam.	CL, CL-ML	A-6, A-4	100	100	95-100	80-95	15-40	7-33

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In								Pct	
Gu--------------- Guyton	0-19	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	65-90	<27	NP-7
	19-40	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	100	100	94-100	75-95	22-40	6-18
	40-60	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	100	100	95-100	50-95	<40	NP-18
GY--------------- Guyton	0-16	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	65-90	<27	NP-7
	16-45	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	100	100	94-100	75-95	22-40	6-18
	45-60	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	100	100	95-100	50-95	<40	NP-18
GZ*:										
Guyton----------	0-29	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	65-90	<27	NP-7
	29-40	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	100	100	94-100	75-95	22-40	6-18
	40-60	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	100	100	95-100	50-95	<40	NP-18
Ouachita--------	0-9	Silt loam--------	ML, CL-ML, CL	A-4	100	100	85-95	55-85	<30	2-10
	9-55	Silt loam, loam, very fine sandy loam.	ML, CL-ML, CL	A-4	100	100	85-95	55-85	<30	2-10
	55-60	Silt loam, loam, silty clay loam.	CL, CL-ML	A-4, A-6	100	100	85-95	55-90	25-40	5-15
HA--------------- Haggerty	0-8	Fine sandy loam	SM, SC-SM, SC, CL-ML	A-4	100	95-100	70-85	35-60	10-30	NP-10
	8-40	Fine sandy loam, loamy fine sand.	SM, SC-SM, SC, CL-ML	A-4	95-100	85-100	70-80	35-60	10-30	NP-10
	40-60	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	95-100	85-100	60-80	5-35	0-20	NP
HB--------------- Haggerty	0-7	Silty clay loam	CL, CH	A-6, A-7-6	100	100	100	95-100	30-75	11-50
	7-37	Fine sandy loam, loamy fine sand.	SM, SC-SM, SC, CL-ML	A-4	95-100	85-100	70-80	35-60	10-30	NP-10
	37-60	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	95-100	85-100	60-80	5-35	0-20	NP
Hd--------------- Harleston	0-17	Fine sandy loam	ML, SM, CL-ML, SC-SM	A-2, A-4	90-100	85-100	60-85	30-55	<25	NP-7
	17-37	Sandy loam, loam	SC, CL, CL-ML, SC-SM	A-2, A-4	90-100	85-100	60-95	30-70	20-30	5-10
	37-60	Sandy loam, loam, sandy clay loam.	SC, CL, CL-ML, SC-SM	A-2, A-4, A-6	90-100	85-100	60-95	30-70	20-35	5-13
He--------------- Hebert	0-10	Silt loam--------	ML, CL-ML	A-4	100	100	100	65-100	<27	NP-7
	10-37	Loam, silt loam, silty clay loam.	CL	A-6, A-7-6	100	100	100	85-100	31-45	11-22
	37-60	Very fine sandy loam, silty clay loam, silt loam.	ML, CL-ML, CL	A-4, A-6	100	100	90-100	60-100	22-40	3-18

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
HP*:										
Hebert	0-10	Silt loam	ML, CL-ML	A-4	100	100	100	65-100	<27	NP-7
	10-35	Loam, silt loam, silty clay loam.	CL	A-6, A-7-6	100	100	100	85-100	31-45	11-22
	35-60	Very fine sandy loam, silty clay loam, silt loam.	ML, CL-ML, CL	A-4, A-6	100	100	90-100	60-100	22-40	3-18
Perry	0-9	Clay	CL, CH	A-7-6	100	100	100	95-100	45-80	22-50
	9-42	Clay	CH	A-7-6	100	100	100	95-100	60-80	33-50
	42-60	Clay	CH, CL	A-7-6	90-100	85-100	75-100	70-100	45-80	22-50
ID*:										
Iuka	0-6	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4, A-2	95-100	90-100	70-100	30-60	<20	NP-7
	6-30	Fine sandy loam, loam, sandy loam.	SM, SC-SM, ML, CL-ML	A-4	95-100	85-100	65-100	36-75	<30	NP-7
	30-60	Sandy loam, fine sandy loam, loamy fine sand.	SM, ML	A-2, A-4	95-100	90-100	70-100	25-60	<30	NP-7
Ochlockonee	0-8	Fine sandy loam	SM, ML, SC-SM, CL-ML	A-4, A-2	100	95-100	65-90	40-70	<26	NP-5
	8-24	Fine sandy loam, sandy loam, silt loam.	SM, ML, SC, CL	A-4	100	95-100	95-100	36-75	<32	NP-9
	24-60	Loamy sand, sandy loam, silt loam, sandy clay loam.	SM, ML, CL, SC	A-4, A-2	100	95-100	85-99	13-80	<32	NP-9
Kn: Kirvin	0-5	Fine sandy loam	SM, ML, CL, SC	A-4	95-100	95-98	90-95	36-70	<30	NP-8
	5-36	Clay loam, sandy clay, clay.	CL, CH	A-7	95-100	90-100	85-100	53-95	42-67	24-43
	36-60	Sandy clay loam, clay loam, clay, sandy clay.	CL, CH	A-6, A-7	95-100	90-100	75-100	51-90	32-59	16-32
KR: Kirvin	0-12	Fine sandy loam	SM, ML, CL, SC	A-4	95-100	95-98	90-95	36-70	<30	NP-8
	12-30	Clay loam, sandy clay, clay.	CL, CH	A-7	95-100	90-100	85-100	53-95	42-67	24-43
	30-60	Sandy clay loam, clay loam, clay, sandy clay.	CL, CH	A-6, A-7	95-100	90-100	75-100	51-90	32-59	16-32
Le: Libuse	0-11	Silt loam	ML, CL-ML	A-4	100	100	85-100	60-90	<30	NP-7
	11-26	Silty clay loam, loam, silt loam.	CL	A-6	100	100	85-100	70-90	30-40	12-18
	26-60	Silt loam, loam, silty clay loam.	CL	A-6	100	100	85-100	60-90	30-40	12-18
LF: Libuse	0-9	Silt loam	ML, CL-ML	A-4	100	100	85-100	60-90	<30	NP-7
	9-24	Silty clay loam, loam, silt loam.	CL	A-6	100	100	85-100	70-90	30-40	12-18
	24-60	Silt loam, loam, silty clay loam.	CL	A-6	100	100	85-100	60-90	30-40	12-18

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
LT--------------- Litro	0-6	Clay-------------	CL, CH	A-6, A-7-6	100	100	90-100	85-95	38-70	15-41
	6-60	Clay, silty clay	CH, CL	A-6, A-7-6	100	100	90-100	85-95	38-70	15-41
Ma--------------- Mahan	0-12	Fine sandy loam	SM, SC-SM, ML, SC	A-2-4, A-4	90-100	85-100	65-80	30-55	<25	NP-8
	12-51	Sandy clay loam, sandy clay, clay, clay loam.	CL, MH, ML, CH	A-7-6, A-6, A-7-5	90-100	85-95	80-90	50-85	36-55	12-22
	51-60	Sandy loam, fine sandy loam, sandy clay loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-4, A-6	90-100	85-95	65-85	35-55	16-35	4-18
MH--------------- Mahan	0-8	Fine sandy loam	SM, SC-SM, ML, SC	A-2-4, A-4	90-100	85-100	65-80	30-55	<25	NP-8
	8-45	Sandy clay loam, sandy clay, clay, clay loam.	CL, MH, ML, CH	A-7-6, A-6, A-7-5	90-100	85-95	80-90	50-85	36-55	12-22
	45-60	Sandy loam, fine sandy loam, sandy clay loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-4, A-6	90-100	85-95	65-85	35-55	16-35	4-18
Mn--------------- Malbis	0-15	Fine sandy loam	SM, ML	A-4	100	97-100	91-97	40-62	<30	NP-5
	15-31	Loam, sandy clay loam, clay loam.	CL-ML, CL	A-4, A-6	99-100	95-100	80-100	55-70	21-35	5-11
	31-60	Sandy clay loam, clay loam, loam.	ML, CL	A-4, A-6, A-7	98-100	96-100	90-100	56-80	29-49	4-15
Mr--------------- McLaurin	0-17	Fine sandy loam	SM	A-4	90-100	90-100	70-85	36-45	<30	NP-4
	17-41	Sandy loam, fine sandy loam, loam.	SM, SC, SC-SM	A-4	90-100	90-100	85-95	36-45	<30	NP-10
	41-48	Loamy fine sand, loamy sand, sandy loam.	SM	A-2, A-4	90-100	90-100	50-85	15-45	<20	NP-4
	48-60	Sandy loam, sandy clay loam, loam.	SC, ML, CL, SM	A-4, A-6	90-100	90-100	70-80	36-55	30-40	6-15
Or--------------- Ora	0-11	Fine sandy loam	SC-SM, SM, ML, CL-ML	A-4, A-2	100	95-100	65-85	30-65	<30	NP-5
	11-29	Clay loam, sandy clay loam, loam.	CL	A-6, A-4, A-7	100	95-100	80-100	50-80	25-48	8-22
	29-45	Sandy clay loam, loam, sandy loam.	CL	A-6, A-7, A-4	100	95-100	80-100	50-75	25-43	8-25
	45-60	Sandy clay loam, loam, sandy loam.	CL	A-6, A-7	100	95-100	80-98	50-60	30-49	11-30
OS--------------- Ora	0-5	Fine sandy loam	SC-SM, SM, ML, CL-ML	A-4, A-2	100	95-100	65-85	30-65	<30	NP-5
	5-25	Clay loam, sandy clay loam, loam.	CL	A-6, A-4, A-7	100	95-100	80-100	50-80	25-48	8-22
	25-50	Sandy clay loam, loam, sandy loam, loam.	CL	A-6, A-7, A-4	100	95-100	80-100	50-75	25-43	8-25
	50-60	Sandy clay loam, loam, sandy loam.	CL	A-6, A-7	100	95-100	80-98	50-60	30-49	11-30

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In								Pct	
PF---------------Perry	0-4	Clay-------------	CH, CL	A-7-6	100	100	100	95-100	45-75	22-45
	4-18	Clay-------------	CH	A-7-6	100	100	100	95-100	60-80	33-50
	18-70	Clay-------------	CH, CL	A-7-6	90-100	85-100	75-100	70-100	45-80	22-50
Po---------------Portland	0-6	Silty clay loam	CL, CL-ML	A-4, A-6, A-7	100	100	90-100	70-95	25-43	7-22
	6-36	Clay, silty clay	CH	A-7	100	100	90-100	75-95	60-80	40-60
	36-60	Clay, silty clay	CH	A-7	100	98-100	90-100	75-95	60-80	40-60
PR---------------Portland	0-10	Clay-------------	CH, CL	A-7	100	100	90-100	75-95	45-65	25-40
	10-25	Clay, silty clay	CH	A-7	100	100	90-100	75-95	60-80	40-60
	25-60	Clay, silty clay	CH	A-7	100	98-100	90-100	75-95	60-80	40-60
Rs---------------Ruston	0-16	Fine sandy loam	SM, ML, CL-ML	A-4, A-2-4	100	85-100	65-85	30-55	<20	NP-7
	16-41	Sandy clay loam, loam, clay loam.	SC, CL	A-6, A-7-6	100	85-100	80-95	36-75	25-45	11-20
	41-47	Fine sandy loam, sandy loam, loamy sand.	SM, ML, CL-ML, SC-SM	A-4, A-2-4	100	85-100	65-85	30-75	<27	NP-7
	47-92	Sandy clay loam, loam, clay loam, fine sandy loam.	SC, CL	A-6, A-7-6	100	85-100	80-95	36-75	25-45	11-20
Sa---------------Sacul	0-3	Very fine sandy loam.	SC-SM, SC, CL-ML, CL	A-4	90-100	85-100	80-95	40-75	<30	4-10
	3-8	Very fine sandy loam, fine sandy loam.	SM, ML, SC-SM, CL-ML	A-2, A-4, A-1	90-100	85-100	80-95	12-75	<30	NP-10
	8-52	Clay, silty clay, clay loam, sandy clay.	CH, CL, SC	A-7	90-100	85-100	85-100	40-95	45-70	20-40
	52-60	Silty clay loam, clay loam, silt loam.	CL, SC	A-6, A-7, A-4, A-2	90-100	85-100	85-100	30-95	25-48	8-25
SB---------------Sacul	0-4	Very fine sandy loam.	SC-SM, SC, CL-ML, CL	A-4	90-100	85-100	80-95	40-75	<30	4-10
	4-10	Very fine sandy loam, fine sandy loam.	SM, ML, SC-SM, CL-ML	A-2, A-4, A-1	90-100	85-100	80-95	12-75	<30	NP-10
	10-46	Clay, silty clay, clay loam, sandy clay.	CH, CL, SC	A-7	90-100	85-100	80-95	40-95	45-70	20-40
	46-60	Silty clay loam, clay loam, silt loam.	CL, SC	A-6, A-7, A-4, A-2	90-100	85-100	80-95	30-95	25-48	8-25
Sg---------------Savannah	0-13	Fine sandy loam	SM, ML	A-2-4, A-4	98-100	90-100	60-100	30-65	<25	NP-4
	13-26	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	98-100	90-100	80-100	40-80	23-40	7-19
	26-60	Loam, clay loam, sandy clay loam, sandy loam.	CL, SC, CL-ML	A-4, A-6, A-7, A-2	94-100	90-100	60-100	30-80	23-43	7-19
SH---------------Savannah	0-11	Fine sandy loam	SM, ML	A-2-4, A-4	98-100	90-100	60-100	30-65	<25	NP-4
	11-28	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	98-100	90-100	80-100	40-80	23-40	7-19
	28-60	Loam, clay loam, sandy clay loam.	CL, SC, CL-ML	A-4, A-6, A-7, A-2	94-100	90-100	60-100	30-80	23-43	7-19

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
Sk--------------- Sawyer	0-9	Silt loam--------	ML, CL-ML, CL	A-4	100	95-100	85-95	50-90	25-30	3-10
	9-35	Silty clay loam, loam, silt loam.	CL	A-6	100	95-100	85-95	60-95	30-40	10-20
	35-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	100	95-100	90-100	75-95	45-60	20-35
SL--------------- Sawyer	0-5	Silt loam--------	ML, CL-ML, CL	A-4	100	95-100	85-95	50-90	25-30	3-10
	5-35	Silty clay loam, loam, silt loam.	CL	A-6	100	95-100	85-95	60-95	30-40	10-20
	35-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	100	95-100	90-100	75-95	45-60	20-35
SM--------------- Smithdale	0-16	Fine sandy loam	SM, SC-SM	A-4, A-2	100	85-100	60-95	28-49	<20	NP-5
	16-40	Clay loam, sandy clay loam, loam, sandy loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	100	85-100	80-96	45-75	23-38	7-16
	40-60	Loam, sandy loam	SM, ML, CL, SC	A-4	100	85-100	65-95	36-70	<30	NP-10
So--------------- Smithton	0-5	Fine sandy loam	SM, SC-SM	A-2, A-4	95-100	95-100	60-85	30-50	15-25	NP-5
	5-14	Fine sandy loam, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-2, A-4	95-100	95-100	60-95	30-75	20-25	NP-5
	14-39	Fine sandy loam, loam, very fine sandy loam.	ML, CL-ML, SM, SC-SM	A-4, A-2	95-100	95-100	60-95	30-90	15-25	NP-7
	39-60	Fine sandy loam, loam, sandy loam.	CL-ML, CL, SC-SM, SC	A-4, A-6, A-2	95-100	95-100	60-95	30-95	15-35	NP-13
St--------------- Sterlington	0-10	Very fine sandy loam.	ML, CL-ML	A-4	100	100	90-100	60-95	14-23	NP-7
	10-42	Silt loam, very fine sandy loam.	CL-ML, ML	A-4	100	100	90-100	80-95	14-28	NP-7
	42-60	Very fine sandy loam, silt loam, loam.	ML, CL-ML	A-4	100	100	90-100	80-95	14-28	NP-7
Tr--------------- Trep	0-5	Loamy fine sand	SM	A-2-4	100	95-100	90-95	15-30	<25	NP-4
	5-34	Loamy fine sand, fine sand.	SM	A-2-4	100	95-100	90-95	15-30	<25	NP-3
	34-60	Sandy clay loam, loam.	SC, CL	A-6	100	95-100	80-90	40-70	25-40	11-20
Wc--------------- Warnock	0-9	Fine sandy loam	SM, SC-SM	A-4, A-2	90-100	85-100	60-85	30-50	15-25	NP-7
	9-15	Fine sandy loam, sandy loam, loamy fine sand.	SM, SC-SM	A-2, A-4	90-100	85-100	50-85	15-50	15-25	NP-7
	15-56	Loam, sandy clay loam, clay loam.	SC, SC-SM, CL, CL-ML	A-4, A-6	90-100	85-100	80-100	36-80	20-40	7-20
	56-60	Loam, sandy clay loam, clay loam.	SC, SC-SM, CL, CL-ML	A-4, A-6	90-100	85-100	80-100	36-95	15-40	4-20

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
Wr---------------- Wrightsville	0-19	Silt loam--------	ML, CL-ML, CL	A-4	100	95-100	90-100	70-100	<30	3-10
	19-49	Silty clay, clay, silty clay loam.	CH, CL, ML, MH	A-7, A-6	100	100	95-100	75-95	39-60	15-25
	49-60	Silty clay loam, silty clay, clay.	CL, CH, MH	A-7, A-6	100	95-100	90-100	70-95	39-60	15-25

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--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)

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/cc	In/hr	In/in	pH				Pct
An--------------- Angie	0-11	4-18	1.35-1.65	0.6-2.0	0.18-0.24	4.5-6.5	Low-----------	0.49	5	.5-2
	11-60	35-60	1.20-1.60	0.06-0.2	0.16-0.22	3.6-6.0	High----------	0.32		
Ba--------------- Betis	0-25	2-10	1.20-1.50	6.0-20	0.05-0.09	4.5-6.0	Low-----------	0.17	5	<1
	25-75	5-15	1.20-1.50	6.0-20	0.08-0.11	4.5-6.0	Low-----------	0.17		
Be--------------- Bienville	0-6	4-15	1.35-1.65	6.0-20	0.07-0.11	4.5-6.5	Low-----------	0.20	5	<2
	6-28	2-15	1.35-1.60	2.0-6.0	0.08-0.11	4.5-6.5	Low-----------	0.20		
	28-60	5-20	1.35-1.70	2.0-6.0	0.08-0.13	4.5-6.0	Low-----------	0.20		
Bh--------------- Bowie	0-14	3-15	1.40-1.69	2.0-6.0	0.10-0.15	4.5-6.5	Low-----------	0.32	5	.5-1
	14-34	18-35	1.60-1.69	0.6-2.0	0.11-0.18	4.5-5.5	Low-----------	0.32		
	34-60	18-35	1.60-1.70	0.2-0.6	0.11-0.18	4.5-5.5	Low-----------	0.32		
Bo--------------- Boykin	0-6	3-10	1.40-1.60	6.0-20	0.07-0.11	4.5-6.5	Low-----------	0.20	5	<1
	6-24	3-10	1.40-1.60	6.0-20	0.07-0.11	4.5-6.5	Low-----------	0.20		
	24-60	18-30	1.45-1.70	0.6-2.0	0.13-0.17	4.5-6.0	Low-----------	0.28		
Br--------------- Briley	0-4	5-18	1.50-1.65	6.0-20	0.07-0.11	4.5-6.5	Low-----------	0.20	5	<2
	4-23	5-18	1.50-1.65	6.0-20	0.07-0.11	4.5-6.5	Low-----------	0.20		
	23-60	15-35	1.55-1.69	0.6-2.0	0.13-0.17	4.5-6.0	Low-----------	0.24		
Ca--------------- Cahaba	0-10	7-17	1.35-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low-----------	0.24	5	.5-2
	10-37	18-35	1.35-1.60	0.6-2.0	0.12-0.20	4.5-6.0	Low-----------	0.28		
	37-68	4-20	1.40-1.70	2.0-20	0.05-0.10	4.5-6.0	Low-----------	0.24		
Dk--------------- Darley	0-13	5-15	1.35-1.70	2.0-6.0	0.08-0.12	4.5-6.5	Low-----------	0.17	3	.5-4
	13-45	35-60	1.20-1.40	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.24		
	45-60	35-60	1.20-1.40	0.2-0.6	0.10-0.20	4.5-5.5	Low-----------	0.24		
DM--------------- Darley	0-12	5-15	1.35-1.70	2.0-6.0	0.08-0.12	4.5-6.5	Low-----------	0.17	3	.5-4
	12-35	35-60	1.20-1.40	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.24		
	35-60	35-60	1.20-1.40	0.2-0.6	0.10-0.20	4.5-5.5	Low-----------	0.24		
DO--------------- Darley	0-10	5-15	1.35-1.70	2.0-6.0	0.08-0.12	4.5-6.5	Low-----------	0.17	3	.5-4
	10-26	35-60	1.20-1.40	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.24		
	26-45	35-60	1.20-1.40	0.2-0.6	0.10-0.20	4.5-5.5	Low-----------	0.24		
	45-60	15-35	1.35-1.70	0.2-0.6	0.11-0.17	4.5-5.5	Low-----------	0.28		
ED--------------- Eastwood	0-9	3-18	1.20-1.60	0.6-2.0	0.13-0.20	4.5-6.0	Low-----------	0.55	4	.5-1
	9-43	40-65	1.20-1.45	<0.06	0.12-0.18	3.6-5.5	High----------	0.32		
	43-60	25-40	1.20-1.50	0.06-0.2	0.12-0.20	3.6-6.5	High----------	0.32		
	60-65	15-35	1.35-1.65	0.06-0.2	0.10-0.15	4.5-7.3	Moderate------	0.37		
Fr--------------- Frizzell	0-4	8-18	1.35-1.65	0.6-2.0	0.15-0.22	4.5-6.5	Low-----------	0.49	5	.5-2
	4-36	8-18	1.35-1.65	0.6-2.0	0.15-0.20	4.5-6.0	Low-----------	0.43		
	36-60	14-30	1.35-1.65	0.06-0.2	0.15-0.20	4.5-6.0	Low-----------	0.43		
Gm--------------- Groom	0-3	10-20	1.30-1.65	0.6-2.0	0.18-0.24	3.6-5.5	Low-----------	0.43	5	.5-3
	3-11	18-25	1.35-1.70	0.2-0.6	0.18-0.24	3.6-5.5	Low-----------	0.37		
	11-60	20-35	1.35-1.70	0.2-0.6	0.15-0.24	3.6-6.0	Moderate------	0.37		
GO--------------- Groom	0-6	27-39	1.35-1.60	0.06-0.2	0.15-0.19	3.6-5.5	Moderate------	0.37	5	.5-3
	6-16	18-25	1.35-1.70	0.2-0.6	0.18-0.24	3.6-5.5	Low-----------	0.37		
	16-60	20-35	1.35-1.70	0.2-0.6	0.15-0.24	3.6-6.0	Moderate------	0.37		

See footnote at end of table.

TABLE 14.--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/cc	In/hr	In/in	pH				Pct
Gu----------------	0-19	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low-----------	0.43	5	.5-4
Guyton	19-40	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low-----------	0.37		
	40-60	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low-----------	0.37		
GY----------------	0-16	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low-----------	0.43	5	.5-4
Guyton	16-45	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low-----------	0.37		
	45-60	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low-----------	0.37		
GZ*:										
Guyton-----------	0-29	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low-----------	0.43	5	.5-4
	29-40	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low-----------	0.37		
	40-60	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low-----------	0.37		
Ouachita---------	0-9	8-25	1.35-1.60	0.6-2.0	0.15-0.22	4.5-5.5	Low-----------	0.37	5	1-4
	9-43	8-25	1.35-1.60	0.6-2.0	0.15-0.22	4.5-5.5	Low-----------	0.37		
	43-60	18-35	1.35-1.60	0.2-0.6	0.15-0.22	4.5-5.5	Low-----------	0.32		
HA----------------	0-8	5-12	1.35-1.70	0.6-6.0	0.11-0.24	3.6-5.5	Low-----------	0.24	5	.5-1
Haggerty	8-40	5-12	1.35-1.70	2.0-6.0	0.11-0.20	3.6-5.5	Low-----------	0.24		
	40-60	2-8	1.45-1.85	6.0-20	0.02-0.11	3.6-5.5	Low-----------	0.17		
HB----------------	0-7	27-40	1.35-1.70	0.06-2.0	0.17-0.22	3.6-5.5	High----------	0.28	5	.5-4
Haggerty	7-37	5-12	1.35-1.70	2.0-6.0	0.11-0.20	3.6-5.5	Low-----------	0.24		
	37-60	2-8	1.45-1.85	6.0-20	0.02-0.11	3.6-5.5	Low-----------	0.17		
Hd----------------	0-17	2-8	1.25-1.35	0.6-6.0	0.08-0.16	3.6-5.5	Low-----------	0.20	5	.5-3
Harleston	17-37	8-18	1.55-1.65	0.6-2.0	0.13-0.16	3.6-5.5	Low-----------	0.32		
	37-60	8-27	1.55-1.65	0.6-2.0	0.13-0.16	3.6-5.5	Low-----------	0.32		
He----------------	0-10	10-27	1.30-1.65	0.6-2.0	0.21-0.23	4.5-7.3	Low-----------	0.43	5	.5-4
Hebert	10-37	14-35	1.30-1.65	0.2-0.6	0.18-0.22	4.5-6.5	Moderate------	0.32		
	37-60	10-35	1.30-1.65	0.6-2.0	0.18-0.22	5.1-7.8	Low-----------	0.37		
HP*:										
Hebert-----------	0-10	10-27	1.30-1.65	0.6-2.0	0.21-0.23	4.5-7.3	Low-----------	0.43	5	.5-4
	10-35	14-35	1.30-1.65	0.2-0.6	0.18-0.22	4.5-6.5	Moderate------	0.32		
	35-60	10-35	1.30-1.65	0.6-2.0	0.18-0.22	5.1-7.8	Low-----------	0.37		
Perry------------	0-9	55-85	1.35-1.70	<0.06	0.12-0.18	4.5-6.5	High----------	0.32	5	.5-4
	9-42	55-85	1.17-1.40	<0.06	0.12-0.18	4.5-7.3	Very high-----	0.28		
	42-60	55-85	1.17-1.35	<0.06	0.12-0.18	5.6-8.4	Very high-----	0.28		
ID*:										
Iuka-------------	0-6	6-15	1.35-1.70	2.0-6.0	0.10-0.15	4.5-5.5	Low-----------	0.24	5	.5-2
	6-30	8-18	1.35-1.70	0.6-2.0	0.10-0.20	3.6-5.5	Low-----------	0.28		
	30-60	5-15	1.35-1.70	0.6-2.0	0.05-0.15	3.6-5.5	Low-----------	0.20		
Ochlockonee------	0-8	3-18	1.40-1.60	2.0-6.0	0.07-0.14	4.5-6.5	Low-----------	0.20	5	.5-2
	8-24	8-18	1.40-1.60	2.0-6.0	0.10-0.20	4.5-6.5	Low-----------	0.20		
	24-60	3-18	1.40-1.70	2.0-6.0	0.06-0.12	3.6-6.5	Low-----------	0.17		
Kn----------------	0-5	2-15	1.20-1.40	2.0-6.0	0.11-0.16	5.1-7.3	Low-----------	0.37	4	<2
Kirvin	5-36	35-60	1.24-1.45	0.2-0.6	0.10-0.15	3.6-5.5	Moderate------	0.32		
	36-60	25-50	1.35-1.60	0.2-0.6	0.10-0.16	3.6-5.0	Moderate------	0.32		
KR----------------	0-12	2-15	1.20-1.40	2.0-6.0	0.11-0.16	5.1-7.3	Low-----------	0.37	4	<2
Kirvin	12-30	35-60	1.24-1.45	0.2-0.6	0.10-0.15	3.6-5.5	Moderate------	0.32		
	30-60	25-50	1.35-1.60	0.2-0.6	0.10-0.16	3.6-5.0	Moderate------	0.32		

See footnote at end of table.

TABLE 14.--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/cc	In/hr	In/in	pH				Pct
Le---------------- Libuse	0-11	5-15	1.35-1.65	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.49	3	.5-2
	11-26	18-32	1.35-1.70	0.2-0.6	0.18-0.22	4.5-6.0	Low----------	0.37		
	26-60	18-35	1.45-1.80	0.06-0.2	0.10-0.14	4.5-6.5	Low----------	0.37		
LF---------------- Libuse	0-9	5-15	1.35-1.65	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.49	3	.5-2
	9-24	18-32	1.35-1.70	0.2-0.6	0.18-0.22	4.5-6.0	Low----------	0.37		
	24-60	18-35	1.45-1.80	0.06-0.2	0.10-0.14	4.5-6.5	Low----------	0.37		
LT---------------- Litro	0-6	40-50	1.20-1.60	<0.06	0.12-0.20	3.6-5.5	High---------	0.32	3	.5-3
	6-60	40-50	1.20-1.60	<0.06	0.12-0.20	3.6-5.5	High---------	0.32		
Ma---------------- Mahan	0-12	2-15	1.35-1.70	2.0-6.0	0.10-0.15	5.1-6.0	Low----------	0.28	5	.5-4
	12-51	35-60	1.30-1.70	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.32		
	51-60	10-35	1.35-1.70	0.6-2.0	0.10-0.17	4.5-6.0	Low----------	0.28		
MH---------------- Mahan	0-8	2-15	1.35-1.70	2.0-6.0	0.10-0.15	5.1-6.0	Low----------	0.28	5	.5-4
	8-45	35-60	1.30-1.70	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.32		
	45-60	10-35	1.35-1.70	0.6-2.0	0.10-0.17	4.5-6.0	Low----------	0.28		
Mn---------------- Malbis	0-15	10-20	1.30-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.24	5	.5-1
	15-31	18-33	1.30-1.70	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.28		
	31-60	20-35	1.40-1.60	0.2-0.6	0.12-0.17	4.5-5.5	Low----------	0.28		
Mr---------------- McLaurin	0-17	5-10	1.40-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Low----------	0.20	5	.3-2
	17-41	10-18	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20		
	41-48	5-15	1.30-1.70	2.0-6.0	0.05-0.10	4.5-5.5	Very low-----	0.20		
	48-60	5-27	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20		
Or---------------- Ora	0-11	10-18	1.45-1.55	2.0-6.0	0.10-0.13	3.6-5.5	Low----------	0.28	3	1-3
	11-29	18-33	1.45-1.60	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.37		
	29-45	18-33	1.70-1.80	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.32		
	45-60	10-35	1.65-1.75	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.37		
OS---------------- Ora	0-5	10-18	1.45-1.55	2.0-6.0	0.10-0.13	3.6-5.5	Low----------	0.28	3	1-3
	5-25	18-33	1.45-1.60	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.37		
	25-50	18-33	1.70-1.80	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.32		
	50-60	10-35	1.65-1.75	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.37		
PF---------------- Perry	0-4	40-80	1.20-1.55	<0.06	0.12-0.18	4.5-6.5	High---------	0.32	5	.5-4
	4-18	55-85	1.17-1.40	<0.06	0.12-0.18	4.5-7.3	Very high----	0.28		
	18-70	55-85	1.17-1.35	<0.06	0.12-0.18	5.6-8.4	Very high----	0.28		
Po---------------- Portland	0-6	15-35	1.25-1.55	0.2-2.0	0.16-0.24	4.5-5.5	Low----------	0.43	5	1-4
	6-36	60-85	1.15-1.45	<0.06	0.12-0.18	4.5-8.4	High---------	0.32		
	36-60	55-85	1.15-1.45	<0.06	0.12-0.18	4.5-8.4	High---------	0.32		
PR---------------- Portland	0-10	40-60	1.15-1.50	<0.06	0.12-0.18	4.5-5.5	High---------	0.32	5	1-4
	10-25	60-85	1.15-1.45	<0.06	0.12-0.18	4.5-8.4	High---------	0.32		
	25-60	55-85	1.15-1.45	<0.06	0.12-0.18	4.5-8.4	High---------	0.32		
Rs---------------- Ruston	0-16	5-20	1.30-1.70	0.6-2.0	0.09-0.16	4.5-6.5	Low----------	0.28	5	.5-2
	16-41	18-35	1.40-1.70	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.28		
	41-47	10-20	1.30-1.70	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28		
	47-67	15-38	1.40-1.70	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.28		
Sa---------------- Sacul	0-3	10-20	1.30-1.50	0.6-2.0	0.13-0.17	4.5-6.0	Low----------	0.32	5	1-3
	3-8	2-20	1.40-1.60	0.6-2.0	0.07-0.17	4.5-6.0	Low----------	0.28		
	8-52	35-60	1.25-1.40	0.06-0.2	0.15-0.18	3.6-5.5	High---------	0.32		
	52-60	15-40	1.30-1.45	0.2-0.6	0.14-0.18	3.6-5.5	Low----------	0.28		

See footnote at end of table.

TABLE 14.--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/cc	In/hr	In/in	pH				Pct
SB---------------Sacul	0-4	10-20	1.30-1.50	0.6-2.0	0.13-0.17	4.5-6.0	Low-----------	0.32	5	1-3
	4-10	2-20	1.40-1.60	0.6-2.0	0.07-0.17	4.5-6.0	Low-----------	0.28		
	10-46	35-60	1.25-1.40	0.06-0.2	0.15-0.18	3.6-5.5	High----------	0.32		
	46-60	15-40	1.30-1.45	0.2-0.6	0.14-0.18	3.6-5.5	Low-----------	0.28		
Sg---------------Savannah	0-13	3-16	1.50-1.60	0.6-2.0	0.13-0.16	3.6-5.5	Low-----------	0.24	3	.5-3
	13-26	18-32	1.45-1.65	0.6-2.0	0.11-0.17	3.6-5.5	Low-----------	0.28		
	26-60	18-32	1.60-1.80	0.2-0.6	0.05-0.10	3.6-5.5	Low-----------	0.24		
SH---------------Savannah	0-11	3-16	1.50-1.60	0.6-2.0	0.13-0.16	3.6-5.5	Low-----------	0.24	3	.5-3
	11-28	18-32	1.45-1.65	0.6-2.0	0.11-0.17	3.6-5.5	Low-----------	0.28		
	28-60	18-32	1.60-1.80	0.2-0.6	0.05-0.10	3.6-5.5	Low-----------	0.24		
Sk---------------Sawyer	0-9	15-25	1.35-1.60	0.6-2.0	0.15-0.20	3.6-5.5	Low-----------	0.37	5	1-3
	9-35	20-40	1.35-1.55	0.2-0.6	0.15-0.20	3.6-5.5	Moderate------	0.32		
	35-60	30-60	1.15-1.50	0.06-0.2	0.14-0.20	3.6-5.5	High----------	0.32		
SL---------------Sawyer	0-5	15-25	1.35-1.60	0.6-2.0	0.15-0.20	3.6-5.5	Low-----------	0.37	5	1-3
	5-35	20-40	1.35-1.55	0.2-0.6	0.15-0.20	3.6-5.5	Moderate------	0.32		
	35-60	30-60	1.15-1.50	0.06-0.2	0.14-0.20	3.6-5.5	High----------	0.32		
SM---------------Smithdale	0-24	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
	24-40	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	40-60	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
So---------------Smithton	0-5	5-18	1.40-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low-----------	0.28	5	1-3
	5-14	5-18	1.40-1.55	0.6-2.0	0.10-0.20	3.6-5.5	Low-----------	0.32		
	14-39	8-18	1.40-1.55	0.2-0.6	0.11-0.20	3.6-5.5	Low-----------	0.32		
	39-60	8-30	1.35-1.55	0.2-0.6	0.11-0.20	3.6-5.5	Low-----------	0.37		
St---------------Sterlington	0-10	10-18	1.30-1.65	0.6-2.0	0.18-0.22	4.5-6.0	Low-----------	0.43	5	.5-4
	10-42	10-18	1.30-1.70	0.6-2.0	0.18-0.22	4.5-6.5	Low-----------	0.37		
	42-60	10-22	1.30-1.70	0.6-2.0	0.18-0.22	4.5-7.3	Low-----------	0.37		
Tr---------------Trep	0-5	4-12	1.35-1.55	6.0-20	0.06-0.10	5.1-6.5	Low-----------	0.24	5	.5-2
	5-34	4-12	1.45-1.60	6.0-20	0.04-0.10	5.1-6.5	Low-----------	0.17		
	34-60	18-35	1.50-1.70	0.6-2.0	0.11-0.16	4.5-6.0	Low-----------	0.32		
Wc---------------Warnock	0-9	2-18	1.30-1.60	2.0-6.0	0.08-0.12	3.6-5.5	Low-----------	0.28	5	.5-3
	9-15	1-18	1.30-1.60	2.0-6.0	0.06-0.12	3.6-5.5	Low-----------	0.24		
	15-56	15-35	1.40-1.65	0.6-2.0	0.12-0.17	3.6-5.5	Low-----------	0.24		
	56-60	12-40	1.40-1.65	0.6-2.0	0.10-0.17	3.6-5.5	Low-----------	0.24		
Wr---------------Wrightsville	0-19	10-25	1.25-1.50	0.2-0.6	0.16-0.24	3.6-5.5	Low-----------	0.43	5	.5-3
	19-49	35-55	1.20-1.45	<0.06	0.14-0.22	3.6-5.5	High----------	0.37		
	49-60	27-50	1.20-1.50	<0.06	0.14-0.22	3.6-5.5	Moderate------	0.37		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means 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				
An---------------- Angie	D	None--------	---	---	3.0-5.0	Apparent	Dec-Apr	High-----	Moderate.
Ba---------------- Betis	A	None--------	---	---	>6.0	---	---	Low------	Moderate.
Be---------------- Bienville	A	Rare--------	---	---	4.0-6.0	Apparent	Dec-Apr	Low------	High.
Bh---------------- Bowie	B	None--------	---	---	3.5-5.0	Perched	Jan-Apr	Moderate	High.
Bo---------------- Boykin	B	None--------	---	---	>6.0	---	---	Moderate	High.
Br---------------- Briley	B	None--------	---	---	>6.0	---	---	Moderate	High.
Ca---------------- Cahaba	B	Rare--------	---	---	>6.0	---	---	Moderate	Moderate.
Dk, DM, DO-------- Darley	C	None--------	---	---	>6.0	---	---	High-----	High.
ED---------------- Eastwood	D	None--------	---	---	>6.0	---	---	High-----	High.
Fr---------------- Frizzell	C	None--------	---	---	1.5-4.0	Apparent	Dec-Apr	High-----	High.
Gm---------------- Groom	C	Occasional	Long------	Nov-Jul	0-1.0	Apparent	Nov-Jul	High-----	Moderate.
GO---------------- Groom	C	Frequent----	Long------	Nov-Jul	0-1.0	Apparent	Nov-Jul	High-----	Moderate.
Gu---------------- Guyton	D	Rare--------	---	---	0-1.5	Perched	Dec-May	High-----	High.
GY---------------- Guyton	D	Frequent----	Very brief to long.	Jan-Dec	0-1.5	Perched	Dec-May	High-----	High.
GZ*:									
Guyton-----------	D	Frequent----	Very brief to long.	Jan-Dec	0-1.5	Perched	Dec-May	High-----	High.
Ouachita---------	C	Frequent----	Very brief to long.	Jan-Dec	>6.0	---	---	Moderate	Moderate.
HA, HB------------ Haggerty	B	Frequent----	Very long	Nov-Jul	0-1.5	Apparent	Nov-Jun	High-----	High.
Hd---------------- Harleston	C	Rare--------	---	---	2.0-3.0	Apparent	Nov-Mar	Moderate	High.

See footnote at end of table.

TABLE 15.--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				
He----------------- Hebert	C	Occasional	Brief to very long.	Dec-Apr	1.5-3.0	Apparent	Dec-Apr	High-----	Moderate.
HP*:									
Hebert-----------	C	Frequent----	Brief to very long.	Dec-Apr	1.5-3.0	Apparent	Dec-Apr	High-----	Moderate.
Perry------------	D	Frequent----	Brief to very long.	Dec-Jun	0-2.0	Apparent	Dec-Jun	High-----	Moderate.
ID*:									
Iuka-------------	C	Frequent----	Very brief to brief.	Dec-Apr	1.0-3.0	Apparent	Dec-Apr	Moderate	High.
Ochlockonee------	B	Frequent----	Very brief to brief.	Dec-Apr	3.0-5.0	Apparent	Dec-Apr	Low------	High.
Kn, KR------------ Kirvin	C	None--------	---	---	>6.0	---	---	High-----	High.
Le, LF------------ Libuse	C	None--------	---	---	1.5-3.0	Perched	Dec-Apr	High-----	Moderate.
LT---------------- Litro	D	Frequent----	Brief to long.	Nov-Jul	0-1.0	Apparent	Nov-Jun	High-----	High.
Ma, MH------------ Mahan	C	None--------	---	---	>6.0	---	---	High-----	High.
Mn---------------- Malbis	B	None--------	---	---	2.5-4.0	Perched	Dec-Mar	Moderate	Moderate.
Mr---------------- McLaurin	B	None--------	---	---	>6.0	---	---	Low------	Moderate.
Or, OS------------ Ora	C	None--------	---	---	2.0-3.5	Perched	Feb-Apr	Moderate	High.
PF---------------- Perry	D	Frequent----	Brief to very long.	Dec-Jun	0-2.0	Apparent	Dec-Jun	High-----	Moderate.
Po---------------- Portland	D	Occasional	Very brief to long.	Dec-May	1.0-2.0	Perched	Dec-May	High-----	Moderate.
PR---------------- Portland	D	Frequent----	Very brief to long.	Dec-May	1.0-2.0	Perched	Dec-May	High-----	Moderate.
Rs---------------- Ruston	B	None--------	---	---	>6.0	---	---	Moderate	Moderate.
Sa, SB------------ Sacul	C	None--------	---	---	2.0-4.0	Perched	Dec-Apr	High-----	High.
Sg, SH------------ Savannah	C	None--------	---	---	1.5-3.0	Perched	Jan-Mar	Moderate	High.

See footnote at end of table.

TABLE 15.--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				
Sk, SL----------- Sawyer	C	None--------	---	---	2.0-3.0	Perched	Dec-Apr	High-----	High.
SM--------------- Smithdale	B	None--------	---	---	>6.0	---	---	Low------	Moderate.
So--------------- Smithton	D	Rare--------	---	---	0-1.0	Perched	Dec-May	High-----	High.
St--------------- Sterlington	B	Rare--------	---	---	>6.0	---	---	Low------	Moderate.
Tr--------------- Trep	B	None--------	---	---	3.5-5.0	Perched	Nov-May	High-----	High.
Wc--------------- Warnock	B	None--------	---	---	4.0-6.0	Perched	Dec-Apr	Moderate	High.
Wr--------------- Wrightsville	D	Occasional	Brief to long.	Jan-Dec	0.5-1.5	Perched	Dec-Apr	High-----	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Effective cation-exchange capacity Al
		In	Pct		Ppm	----------Milliequivalents/100 grams of soil----------									Pct	Pct	Pct
Angie very fine sandy loam:[1] (S91LA-111-4)	A	0-4	1.45	5.1	23	0.6	0.2	0.1	0.0	0.0	1.4	6.7	7.6	2.3	11.8	0.0	0.0
	E	4-11	0.42	5.1	15	0.4	0.2	0.1	0.0	0.8	0.6	2.2	2.9	2.1	24.1	0.0	38.1
	Bt1	11-20	0.32	4.9	13	1.2	1.6	0.2	0.0	4.8	0.8	10.4	13.4	8.6	22.4	0.0	55.8
	Bt2	20-25	0.16	4.8	8	0.7	1.8	0.3	0.0	8.6	0.4	16.3	19.1	11.8	14.7	0.0	72.9
	Bt3	25-33	0.18	4.6	8	0.5	2.3	0.4	0.0	11.8	0.0	20.7	23.9	15.0	13.4	0.0	78.7
	Bt4	33-41	0.10	4.6	9	0.3	3.1	0.5	0.1	13.2	0.4	20.6	25.5	17.6	15.7	0.4	75.0
	Btg	41-60	0.09	4.7	9	0.2	2.8	0.3	0.0	12.0	1.0	20.0	23.3	16.3	14.2	0.0	73.5
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10.6[2]	---	---
Betis loamy fine sand:[1] (S91LA-111-2)	A1	0-7	0.88	5.6	20	0.6	0.1	0.1	0.0	0.0	0.6	1.5	2.3	1.4	34.8	0.0	0.0
	A2	7-25	0.25	5.7	26	0.8	0.2	0.1	0.1	0.0	0.4	3.0	4.2	1.6	28.6	2.4	0.0
	Bw	25-45	0.09	5.6	28	1.1	0.2	0.1	0.0	0.0	0.8	1.7	3.1	2.2	45.2	0.0	0.0
	Bt	45-60	0.07	5.4	15	2.4	0.8	0.1	0.0	0.2	0.8	3.0	6.3	4.3	52.4	0.0	4.7
	B/E	60-75	0.04	5.4	21	2.2	0.7	0.1	0.0	0.0	1.0	2.8	5.8	4.0	51.7	0.0	0.0
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	28.6[2]	---	---
Bowie fine sandy loam:[1] (S91LA-111-7)	A	0-4	1.61	5.1	8	0.4	0.1	0.1	0.0	0.0	1.2	14.8	15.4	1.8	3.9	0.0	0.0
	E	4-14	0.28	5.3	5	0.2	0.1	0.0	0.0	0.6	0.4	10.4	10.7	1.3	2.8	0.0	46.2
	Bt1	14-24	0.33	5.3	10	0.9	2.2	0.1	0.0	3.8	0.2	18.5	21.7	7.2	14.7	0.0	52.8
	Bt2	24-34	0.10	5.4	10	0.9	2.4	0.2	0.0	4.0	0.4	18.5	22.0	7.9	15.9	0.0	50.6
	Btv1	34-49	0.02	5.2	7	0.3	1.5	0.1	0.0	4.0	1.0	16.3	18.2	6.9	10.4	0.0	58.0
	Btv2	49-60	0.00	5.2	6	0.1	1.1	0.1	0.0	4.0	1.2	13.4	14.7	6.5	8.8	0.0	61.5
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	13.1[2]	---	---
Boykin loamy fine sand:[1] (S91LA-111-11)	Ap	0-6	1.12	5.2	19	0.5	0.2	0.1	0.0	0.0	0.8	6.0	6.8	1.6	11.8	0.0	0.0
	E	6-24	0.30	5.4	5	0.5	0.1	0.1	0.0	0.0	0.6	1.8	2.5	1.3	28.0	0.0	0.0
	Bt1	24-40	0.21	5.6	5	1.8	0.4	0.2	0.0	0.0	0.6	3.0	5.4	3.0	44.4	0.0	0.0
	Bt2	40-51	0.22	5.0	5	1.0	0.9	0.1	0.0	1.0	1.0	4.8	6.8	4.0	29.4	0.0	25.0
	Bt3	51-60	0.08	4.9	5	1.1	1.8	0.1	0.0	0.8	1.4	6.6	9.6	5.2	31.3	0.0	15.4
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	29.9[2]	---	---

See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Effective cation-exchange capacity Al
		In	Pct		Ppm	Milliequivalents/100 grams of soil									Pct	Pct	Pct
Boykin loamy fine sand:[3] (S90LA-111-12)	Ap	0-6	0.76	7.4	37	1.1	0.3	0.1	0.0	0.0	1.2	1.5	3.0	2.7	50.0	0.0	0.0
	E	6-20	0.10	6.9	13	0.6	0.2	0.0	0.0	0.0	0.8	1.0	1.8	1.6	44.4	0.0	0.0
	Bt1	20-29	0.08	6.6	10	0.8	0.4	0.1	0.0	0.0	0.8	2.2	3.5	2.1	37.1	0.0	0.0
	Bt2	29-40	0.04	5.7	15	2.1	0.7	0.2	0.0	0.0	1.0	3.7	6.7	4.0	44.8	0.0	0.0
	Bt3	40-60	0.00	6.0	10	1.3	0.5	0.1	0.0	0.0	1.0	2.5	4.4	2.9	43.2	0.0	0.0
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	37.1[2]	---	---
Briley loamy fine sand:[1] (S91LA-111-6)	A	0-4	0.45	5.5	43	0.5	0.1	0.0	0.0	0.0	0.4	12.6	13.2	1.0	4.5	0.0	0.0
	E1	4-10	0.44	5.6	22	0.3	0.1	0.0	0.0	0.0	0.4	6.7	7.1	0.8	5.6	0.0	0.0
	E2	10-23	0.08	5.3	8	0.2	0.1	0.0	0.0	0.0	1.0	10.4	10.7	1.3	2.8	0.0	0.0
	Bt1	23-35	0.11	5.6	8	3.2	0.7	0.1	0.0	0.0	1.0	10.4	14.4	5.0	27.8	0.0	0.0
	Bt2	35-48	0.00	5.7	10	2.5	0.6	0.1	0.0	0.0	0.8	10.4	13.6	4.0	23.5	0.0	0.0
	Bt3	48-60	0.00	5.7	10	3.5	0.8	0.1	0.0	0.0	0.8	11.6	16.0	5.2	27.5	0.0	0.0
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	27.8[2]	---	---
Cahaba fine sandy loam:[1] (S88LA-111-1)	A	0-4	0.91	4.6	27	1.5	0.3	0.1	0.0	0.0	1.4	7.2	9.1	3.3	20.9	0.0	0.0
	A/B	4-10	0.23	5.6	30	1.2	0.2	0.1	0.0	0.0	1.4	4.2	5.7	2.9	26.3	0.0	0.0
	Bt1	10-19	0.22	5.4	48	1.9	0.3	0.1	0.0	1.0	1.0	5.0	7.3	4.3	31.5	0.0	23.3
	Bt2	19-30	0.21	5.5	108	2.7	0.7	0.2	0.0	1.8	1.2	7.2	10.8	6.6	33.3	0.0	27.3
	Bt3	30-37	0.03	5.6	71	2.6	0.5	0.2	0.0	0.0	0.8	4.8	8.1	4.1	40.7	0.0	0.0
	C1	37-45	0.00	5.7	51	1.7	0.3	0.1	0.0	0.0	0.6	3.6	5.7	2.7	36.8	0.0	0.0
	C2	45-57	0.00	5.8	33	1.4	0.3	0.1	0.0	0.0	0.6	4.2	6.0	2.4	30.0	0.0	0.0
	C3	57-68	0.00	5.9	27	1.0	0.2	0.1	0.0	0.0	1.0	0.6	1.9	2.3	68.4	0.0	0.0
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	16.3[2]	---	----
Darley gravelly loam:[1] (S89LA-111-9)	A	0-7	1.96	4.9	7	1.9	0.4	0.1	0.1	0.0	1.6	10.2	12.7	4.1	19.7	0.8	0.0
	E	7-13	0.79	5.2	5	0.7	0.2	0.0	0.0	0.0	1.0	13.8	14.7	1.9	6.1	0.0	0.0
	Bt1	13-29	0.62	5.3	9	1.7	4.4	0.3	0.0	0.6	1.4	15.6	22.0	8.4	29.1	0.0	7.1
	Bt2	29-45	0.16	5.0	6	0.2	0.0	0.1	0.1	5.8	1.8	21.6	22.0	8.0	1.8	0.5	72.5
	Bt/Bsm	45-60	0.18	4.9	10	0.1	1.9	0.1	0.1	7.8	1.0	18.0	20.2	11.0	10.9	0.5	70.9
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12.6[2]	---	---

See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Effective cation-exchange capacity Al
		In	Pct		Ppm	Milliequivalents/100 grams of soil									Pct	Pct	Pct
Darley gravelly fine sandy loam:[4]	A	0-4	1.56	5.6	17	1.3	0.4	0.1	0.0	0.2	0.4	9.6	11.4	2.4	15.8	0.0	8.3
(S90LA-111-13)	E	4-10	1.45	5.6	7	0.6	0.3	0.1	0.0	0.0	0.6	6.7	7.7	1.6	13.0	0.0	0.0
	Bt1	10-16	0.33	5.1	15	0.6	3.3	0.2	0.0	7.0	0.6	17.0	21.1	11.7	19.4	0.0	59.8
	Bt2	16-24	0.10	5.2	17	0.2	2.8	0.1	0.0	7.0	0.4	17.8	20.9	10.5	14.8	0.0	66.7
	Bt/Bsm	24-42	0.23	5.3	13	0.2	2.5	0.1	0.1	6.4	0.2	18.5	21.4	9.5	13.6	0.5	67.4
	BC1	42-52	0.08	5.2	13	0.2	2.0	0.1	0.1	6.4	0.4	17.8	20.2	9.2	11.9	0.5	69.6
	BC2	52-60	0.00	5.3	12	0.5	1.8	0.1	0.2	6.0	0.2	17.3	19.9	8.8	13.1	1.0	68.2
	---	---	---	---	--	---	---	---	---	---	---	---	---	---	13.2[2]	---	---
Frizzell silt loam:[1]	Ap	0-4	1.98	6.1	30	6.6	0.6	0.1	0.0	0.0	1.0	5.4	12.7	8.3	57.5	0.0	0.0
(S89LA-111-5)	B/E	4-24	0.39	5.0	8	1.7	0.5	0.1	0.1	1.8	0.8	6.0	8.4	5.0	28.6	1.2	36.0
	Bt1	24-36	0.22	5.1	5	0.6	0.5	0.1	0.3	4.0	0.6	10.8	12.3	6.1	12.2	2.4	65.6
	Bt2	36-45	0.13	5.5	9	0.9	1.4	0.1	0.9	5.8	0.8	11.4	14.7	9.9	22.4	6.1	58.6
	Bt3	45-60	0.13	5.5	8	2.2	2.2	0.1	1.7	2.6	0.4	6.0	12.2	9.2	50.8	13.9	28.3
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	68.2[2]	---	---
Frizzell silt loam:[5]	A	0-9	1.31	5.3	25	1.9	0.7	0.1	0.1	0.0	0.6	6.7	9.5	3.4	29.5	1.1	0.0
(S90LA-111-5)	Bt1	9-22	0.01	4.9	20	0.6	0.7	0.0	0.1	4.4	1.2	10.4	11.8	7.0	11.9	0.8	62.9
	Bt2	22-35	0.01	5.2	21	0.5	0.7	0.1	0.2	4.0	1.2	11.8	13.3	6.7	11.3	1.5	59.7
	Bt3	35-54	0.01	5.2	23	1.6	1.8	0.1	0.8	4.6	0.8	12.6	16.9	9.7	25.4	4.7	47.4
	Bt4	54-66	0.01	5.5	27	3.4	3.0	0.1	1.7	4.2	0.8	11.9	20.1	13.2	40.8	8.5	31.8
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	51.7[2]	---	---
Groom silt loam:[1]	A	0-3	2.53	4.6	10	2.0	0.5	0.1	0.1	0.8	1.2	7.8	10.5	4.7	25.7	1.0	17.0
(S89LA-111-7)	BAg	3-11	0.82	4.7	10	1.3	0.4	0.1	0.1	2.6	0.6	5.4	7.3	5.1	26.0	1.4	51.0
	Btg1	11-21	0.52	4.5	7	0.8	1.4	0.0	0.5	9.2	1.8	15.6	18.3	13.7	14.8	2.7	67.2
	Btg2	21-33	0.28	4.9	7	1.5	3.0	0.1	1.0	10.2	1.0	19.8	25.4	16.8	22.0	3.9	60.7
	Btg3	33-48	0.14	4.4	8	3.0	4.7	0.1	3.3	6.4	0.2	16.8	27.9	17.7	39.8	11.8	36.2
	Btg4	48-60	0.22	5.8	8	4.0	5.1	0.1	4.5	3.4	2.0	16.2	29.9	19.1	45.8	15.1	17.8
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	43.6[2]	---	---

See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Effective cation-exchange capacity Al
		In	Pct		Ppm	Milliequivalents/100 grams of soil									Pct	Pct	Pct
Guyton silt loam:[1]																	
(S89LA-111-1)	A	0-4	2.35	4.4	15	2.1	0.8	0.1	0.0	1.6	1.0	12.0	15.0	5.6	20.0	0.0	28.6
	Eg1	4-12	0.79	4.3	12	0.3	0.5	0.1	0.0	4.0	1.0	7.8	8.7	5.9	10.3	0.0	67.8
	Eg2	12-19	0.31	4.6	8	0.6	0.8	0.1	0.1	5.4	1.2	10.2	11.8	8.2	13.6	0.8	65.9
	B/E	19-28	0.15	4.9	8	2.0	1.4	0.1	0.5	9.4	0.4	13.2	17.2	13.8	23.3	2.9	68.1
	Btg1	28-40	0.29	4.9	9	3.7	2.1	0.1	0.9	8.0	0.4	12.6	19.4	15.2	35.1	4.6	52.6
	Btg2	40-52	0.12	4.4	11	4.8	2.6	0.1	1.8	5.2	1.0	9.0	18.3	15.5	50.8	9.8	33.5
	Btg3	52-60	0.35	3.9	16	6.1	3.3	0.1	3.5	3.0	1.2	7.2	20.2	17.2	64.4	17.3	17.4
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	67.5[2]	---	---
Haggerty silty clay loam:[1]																	
(S88LA-111-4)	A	0-7	2.92	4.2	28	0.8	0.6	0.2	0.1	13.4	1.4	27.0	28.7	16.5	5.9	0.3	81.2
	Bt1	7-14	0.28	4.2	7	0.1	0.1	0.0	0.0	2.8	0.6	9.0	9.2	3.6	2.2	0.0	77.8
	Bt2	14-26	0.01	4.5	5	0.1	0.0	0.0	0.0	0.8	0.4	6.0	6.1	1.3	1.6	0.0	61.5
	BC	26-37	0.01	4.6	7	0.1	0.0	0.0	0.0	0.2	0.8	4.8	4.9	1.1	2.0	0.0	18.2
	C	37-60	0.05	4.8	3	0.1	0.1	0.0	0.0	0.2	0.4	6.0	6.2	0.8	3.2	0.0	25.0
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.9[2]	---	---
Harleston fine sandy loam:[1]																	
(S91LA-111-1)	A	0-2	1.05	5.1	9	0.6	0.2	0.1	0.0	0.0	1.0	5.2	6.1	1.9	14.8	0.0	0.0
	E	2-10	0.32	5.4	6	0.6	0.2	0.0	0.0	0.0	1.0	3.7	4.5	1.8	17.8	0.0	0.0
	BE	10-17	0.18	5.3	8	0.9	0.3	0.1	0.0	0.0	1.0	3.6	4.9	2.3	26.5	0.0	0.0
	Bt1	17-29	0.11	5.3	6	0.8	0.5	0.1	0.0	0.4	0.4	3.6	5.0	2.2	28.0	0.0	18.2
	Bt2	29-37	0.10	5.2	6	0.7	0.6	0.1	0.0	0.8	0.6	4.4	5.8	2.8	24.1	0.0	20.6
	Bt3	37-43	0.02	5.0	7	1.0	1.8	0.1	0.1	1.2	0.8	5.9	8.1	4.2	27.2	1.2	28.6
	Bt4	43-52	0.01	5.0	7	0.5	0.9	0.1	0.0	1.6	1.6	6.7	8.2	4.7	18.3	0.0	34.0
	Bt5	52-60	0.04	5.0	6	0.4	1.0	0.1	0.0	2.4	0.4	6.7	8.2	4.3	18.3	0.0	55.8
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	30.3[2]	---	---
Hebert silt loam:[1]																	
(S89LA-111-4)	Ap	0-6	1.71	5.6	134	5.5	0.9	0.3	0.0	0.0	0.6	9.0	15.7	7.3	42.7	0.0	0.0
	E	6-10	0.46	6.0	51	5.6	0.9	0.1	0.1	0.0	0.6	6.6	13.3	7.3	50.4	0.8	0.0
	Bt1	10-20	0.35	5.1	46	9.2	6.5	0.5	0.3	3.6	0.6	12.0	28.5	20.7	57.9	1.1	17.4
	Bt2	20-30	0.28	5.1	63	7.0	7.4	0.4	0.5	3.4	0.6	12.6	27.9	19.3	54.8	1.8	17.6
	Bt3	30-37	0.21	5.7	94	7.7	7.9	0.4	0.7	1.0	0.0	10.2	26.9	17.7	62.1	2.6	5.6
	BC	37-45	0.26	6.2	108	11.5	11.0	0.5	1.2	0.2	0.4	10.1	34.3	24.8	70.6	3.5	0.8
	CB	45-60	0.37	7.6	255	20.7	17.0	0.9	2.3	0.0	0.4	10.8	51.7	41.3	79.1	4.4	0.0
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	76.0[2]	---	---

See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Exchangeable cations: Mg	Exchangeable cations: K	Exchangeable cations: Na	Exchangeable cations: Al	Exchangeable cations: H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity, Na	Saturation: Effective cation-exchange capacity, Al
		In	Pct		Ppm	----------Milliequivalents/100 grams of soil----------									Pct	Pct	Pct
Iuka fine sandy loam:[1]																	
(S90LA-111-10)	A	0-6	1.83	5.1	32	1.8	0.6	0.1	0.2	2.2	1.0	13.3	16.0	5.9	16.9	1.3	37.3
	C1	6-15	0.67	4.8	24	0.7	0.4	0.1	0.2	3.8	0.6	11.1	12.5	5.8	11.2	1.6	65.5
	C2	15-23	0.28	4.6	24	0.5	0.3	0.1	0.2	3.8	1.0	10.6	11.7	5.9	9.4	1.7	64.4
	Cg1	23-30	0.12	4.4	22	0.3	0.2	0.1	0.3	4.0	0.8	10.4	11.3	5.7	8.0	2.7	70.2
	Cg2	30-40	0.02	4.1	25	0.2	0.1	0.0	0.3	3.6	1.2	11.1	11.7	5.4	5.1	2.6	66.7
	Cg3	40-60	0.13	4.3	20	0.2	0.2	0.1	0.4	4.2	1.0	11.1	12.0	6.1	7.5	3.3	68.9
Kirvin fine sandy loam:[1]																	
(S89LA-111-16)	A	0-5	0.83	5.3	12	0.7	0.3	0.1	0.0	0.4	0.4	10.1	11.2	1.9	9.8	0.0	21.1
	Bt1	5-16	0.49	4.8	25	4.0	6.0	0.4	0.1	10.6	0.2	23.4	33.9	21.3	31.0	0.3	49.8
	Bt2	16-24	0.26	4.7	20	2.1	6.3	0.4	0.1	14.4	0.4	27.6	36.5	23.7	24.4	0.3	60.8
	Bt3	24-36	0.08	4.7	16	1.0	4.5	0.2	0.1	10.4	1.8	21.0	26.8	18.0	21.6	0.4	57.8
	BC	36-50	0.01	4.7	15	0.8	4.8	0.2	0.1	11.0	0.8	19.5	25.4	17.7	23.2	0.4	62.1
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	20.2[2]	---	---
Libuse silt loam:[1]																	
(S89LA-111-2)	A	0-3	1.55	4.6	10	0.8	0.3	0.1	0.0	1.0	0.4	1.6	2.8	2.6	42.9	0.0	38.5
	BA	3-11	0.21	5.0	6	0.4	0.4	0.1	0.0	1.4	0.6	2.4	3.3	2.9	27.3	0.0	48.3
	Bt	11-26	0.21	4.9	6	0.3	0.7	0.1	0.0	3.0	0.8	2.2	3.3	4.9	33.3	0.0	61.2
	Btx1	26-45	0.20	5.3	6	0.2	0.6	0.1	0.1	4.6	1.4	4.8	5.8	7.0	17.2	1.7	65.7
	Btx2	45-60	0.08	5.6	6	0.3	1.3	0.1	0.7	6.0	0.4	10.2	12.6	8.8	19.0	5.6	68.2
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	35.1[2]	---	---
Litro clay:[1]																	
(S88LA-111-8)	A	0-6	2.92	4.6	92	9.5	3.7	0.4	0.5	11.6	1.6	28.8	42.9	27.3	32.9	1.2	42.5
	Bg1	6-16	1.57	4.2	43	6.2	3.2	0.4	0.7	19.0	1.6	31.2	41.7	31.1	25.2	1.7	61.1
	Bg2	16-29	0.72	3.8	39	6.0	4.7	0.4	1.4	17.8	0.2	23.4	35.9	30.5	34.8	3.9	58.4
	BCg1	29-47	0.39	3.8	44	7.0	6.9	0.4	2.3	10.4	1.0	18.2	34.8	28.0	47.7	6.6	37.1
	BCg2	47-60	0.43	4.0	46	9.4	10.1	0.5	3.4	7.2	8.0	15.6	39.0	38.6	60.0	8.7	18.7
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	63.4[2]	---	---
Mahan fine sandy loam:[1]																	
(S90LA-111-14)	A	0-4	1.40	5.8	16	1.7	0.3	0.1	0.0	0.0	0.8	5.9	8.0	2.9	26.2	0.0	0.0
	BE	4-12	0.52	5.8	10	0.8	0.3	0.1	0.0	0.0	1.0	6.7	7.9	2.2	15.2	0.0	0.0
	Bt1	12-27	0.20	5.1	14	0.9	4.2	0.4	0.0	1.6	0.8	13.3	18.8	7.9	29.3	0.0	20.3
	Bt2	27-43	0.11	5.2	14	0.1	2.5	0.4	0.0	3.4	3.0	14.1	17.1	9.4	17.5	0.0	36.2
	Bt3	43-51	0.09	4.9	15	0.1	1.5	0.2	0.0	2.4	0.6	14.0	15.8	4.8	11.4	0.0	50.0
	BC	51-60	0.07	4.9	15	0.1	1.4	0.1	0.0	3.0	0.6	13.6	15.2	5.2	10.5	0.0	57.7
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See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity, Na	Saturation: Effective cation-exchange capacity, Al
		In	Pct		Ppm	----------Milliequivalents/100 grams of soil----------									Pct	Pct	Pct
Malbis fine																	
sandy loam:[1]	A	0-8	0.55	4.6	9	0.4	0.2	0.1	0.0	1.2	0.2	8.1	8.8	2.1	8.0	0.0	57.1
(S90LA-111-2)	E	8-15	0.02	5.2	6	0.5	0.3	0.1	0.0	0.0	0.6	4.4	5.3	1.5	17.0	0.0	0.0
	Bt	15-31	0.02	5.2	8	2.1	1.7	0.4	0.0	0.6	0.2	9.6	13.8	5.0	30.4	0.0	12.0
	Btv1	31-47	0.01	5.0	9	0.9	1.5	0.3	0.0	2.8	0.8	10.4	13.1	6.3	20.6	0.0	44.4
	Btv2	47-60	0.01	4.7	7	0.2	0.7	0.2	0.0	5.4	0.6	12.0	13.1	7.1	8.4	0.0	76.1
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.6[2]	---	---
Malbis fine																	
sandy loam:[6]	Ap	0-5	0.83	4.5	16	0.6	0.2	0.0	0.0	0.6	0.2	6.7	7.5	1.6	10.7	0.0	37.5
(S90LA-111-3)	E	5-10	0.01	4.7	11	0.2	0.1	0.0	0.0	0.4	0.4	3.0	3.3	1.1	9.1	0.0	36.4
	Bt	10-25	0.01	4.8	19	1.2	1.2	0.1	0.0	2.2	1.6	11.1	13.6	6.3	18.4	0.0	34.9
	Btv1	25-38	0.01	4.8	16	1.0	1.5	0.1	0.0	4.2	0.2	11.0	13.6	7.0	19.1	0.0	60.0
	Btv2	38-60	0.01	4.6	16	0.3	2.0	0.1	0.0	5.0	1.0	11.1	13.5	8.4	17.8	0.0	59.5
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	15.9[2]	---	---
McLaurin fine																	
sandy loam:[1]	A	0-6	0.32	4.9	8	0.1	0.1	0.0	0.0	0.0	1.2	3.0	3.2	1.4	6.3	0.0	0.0
(S91LA-111-5)	E	6-11	0.21	5.3	6	0.2	0.1	0.0	0.0	0.0	0.8	1.5	1.8	1.1	16.7	0.0	0.0
	EB	11-17	0.10	5.3	7	1.0	0.3	0.1	0.0	0.2	0.8	3.7	5.1	2.4	27.5	0.0	8.3
	Bt1	17-28	0.11	5.4	8	2.2	0.6	0.1	0.0	0.0	1.2	3.0	5.9	4.1	49.2	0.0	0.0
	Bt2	28-41	0.03	5.4	9	1.3	0.4	0.1	0.0	0.0	1.0	5.9	7.7	2.8	23.4	0.0	0.0
	B/E	41-48	0.01	5.6	10	1.1	0.3	0.1	0.1	0.0	0.8	5.9	7.4	2.3	20.3	0.0	0.0
	B't	48-60	0.01	5.6	20	1.7	0.8	0.1	0.1	0.0	0.6	6.7	9.4	3.3	28.7	1.1	0.0
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	23.3[2]	---	---
Ochlockonee fine																	
sandy loam:[1]	A1	0-8	1.12	4.9	34	0.4	0.3	0.1	0.1	3.6	1.2	10.5	11.4	5.7	7.9	0.9	63.2
(S90LA-111-11)	A2	8-24	0.41	4.9	49	0.1	0.1	0.0	0.1	3.0	0.8	8.1	8.4	4.1	3.6	1.2	73.2
	C1	24-45	0.03	4.7	48	0.1	0.1	0.0	0.0	1.4	0.8	5.2	5.4	2.4	3.7	0.0	58.3
	C2	45-55	0.13	4.6	42	0.1	0.1	0.0	0.1	2.4	1.2	3.7	4.0	3.9	7.5	2.5	61.5
	Bb	55-60	0.08	4.3	20	0.1	0.1	0.0	0.1	2.3	1.0	4.8	5.2	3.7	7.7	1.9	62.2

See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Exchangeable cations: Mg	Exchangeable cations: K	Exchangeable cations: Na	Exchangeable cations: Al	Exchangeable cations: H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity, Na	Saturation: Effective cation-exchange capacity, Al
		In	Pct		Ppm	Milliequivalents/100 grams of soil									Pct	Pct	Pct
Ora fine sandy loam:[1]																	
(S88LA-111-3)	A	0-4	2.08	5.0	15	2.3	0.5	0.1	0.0	0.2	0.8	8.4	11.3	3.9	25.7	0.0	5.1
	E	4-11	0.63	5.2	7	1.0	0.3	0.1	0.0	0.0	0.8	4.8	6.2	2.2	22.6	0.0	0.0
	BE	11-17	0.57	4.8	7	0.6	1.5	0.2	0.0	3.6	0.8	11.4	13.7	6.7	16.8	0.0	53.7
	Bt	17-29	0.25	4.9	8	0.2	2.0	0.2	0.1	5.0	0.6	11.3	13.8	8.1	18.1	0.7	61.7
	Btx1	29-37	0.12	5.0	8	0.1	0.7	0.1	0.0	4.6	0.8	11.6	12.5	6.3	7.2	0.0	73.0
	Btx2	37-45	0.03	4.9	6	0.1	0.4	0.1	0.1	2.0	0.2	4.2	4.9	2.9	14.3	2.0	69.0
	C	45-60	0.03	5.0	7	0.1	0.7	0.1	0.0	2.6	1.2	7.2	8.1	4.7	11.1	0.0	55.3
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10.5[2]	---	---
Ouachita silt loam:[1]																	
(S91LA-111-12)	A1	0-2	3.64	4.5	17	1.0	0.8	0.2	0.1	2.0	1.8	15.6	17.7	5.9	11.9	0.6	33.9
	A2	2-9	1.81	4.6	13	0.6	0.4	0.1	0.0	2.8	1.2	10.8	11.9	5.1	9.2	0.0	54.9
	Bw1	9-16	1.04	4.6	11	0.5	0.4	0.0	0.0	2.6	0.8	10.2	11.1	4.3	8.1	0.0	60.5
	Bw2	16-21	1.28	4.8	13	1.0	0.9	0.1	0.0	1.6	1.4	9.6	11.6	5.0	17.2	0.0	32.0
	Bw3	21-27	0.39	4.7	11	0.5	0.7	0.1	0.0	1.6	1.2	6.0	7.3	4.1	17.8	0.0	39.0
	Bw4	27-43	0.32	4.7	12	0.4	0.7	0.0	0.0	1.6	0.8	6.6	7.7	3.5	14.3	0.0	45.7
	Egb	43-55	0.24	4.6	11	0.4	0.8	0.0	0.0	1.8	1.4	6.4	7.6	4.4	15.8	0.0	40.9
	Btgb	55-60	0.42	4.5	0	2.6	1.7	0.1	0.1	2.8	2.2	10.0	14.5	9.5	31.0	0.7	29.5
Perry clay:[1]																	
(S88LA-111-5)	A	0-4	2.19	4.7	49	12.8	11.4	0.9	0.4	11.4	0.8	25.8	51.3	37.7	49.7	0.8	30.2
	Bg	4-11	1.52	4.6	38	11.4	9.2	0.6	0.5	10.6	0.4	27.0	48.7	32.7	44.6	1.0	32.4
	Bgss	11-18	1.13	4.8	46	18.5	17.1	0.9	1.5	5.0	1.2	21.0	59.0	44.2	64.4	2.5	11.3
	2BC	18-30	0.64	5.9	79	21.1	19.6	0.9	2.6	0.0	0.6	13.2	57.4	44.8	77.0	4.5	0.0
	2Ck1	30-48	0.41	7.5	134	28.4	18.8	1.0	3.5	0.0	1.0	10.2	61.9	52.7	83.5	5.7	0.0
	2Ck2	48-70	0.45	7.7	339	49.6	18.2	1.2	3.8	0.0	1.6	5.4	78.2	74.4	93.1	4.9	0.0
Portland silty clay loam:[1]																	
(S88LA-111-6)	A1	0-6	3.25	4.7	41	5.9	5.1	0.4	0.3	8.2	0.8	24.0	35.7	20.7	32.8	0.8	39.6
	A2	6-13	1.09	4.8	41	12.7	12.8	0.8	0.7	10.8	0.8	27.6	54.6	38.6	49.5	1.3	28.0
	Bw	13-22	0.77	6.9	139	28.6	18.9	0.9	1.9	0.0	1.6	14.4	64.7	51.9	77.7	2.9	0.0
	Bss1	22-36	0.47	7.9	220	38.8	17.6	0.9	3.1	0.0	2.0	9.0	69.4	62.4	87.0	4.5	0.0
	Bss2	36-50	0.51	7.9	282	36.7	17.5	0.9	3.4	0.0	1.0	8.4	66.9	59.5	87.4	5.1	0.0
	Cg	50-60	0.57	7.6	191	25.2	16.9	0.8	3.5	0.0	1.2	9.6	56.0	47.6	82.9	6.3	0.0

See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Effective cation-exchange capacity Al
		In	Pct		Ppm	Milliequivalents/100 grams of soil									Pct	Pct	Pct
Ruston fine sandy loam:[1] (S89LA-111-14)	A	0-4	1.12	5.4	5	1.1	0.3	0.1	0.1	0.0	0.4	1.8	3.4	2.0	47.1	2.9	0.0
	E	4-16	0.29	5.6	2	0.5	0.2	0.1	0.1	0.0	0.8	1.6	2.5	1.7	36.0	4.0	0.0
	Bt1	16-27	0.29	5.3	6	2.1	1.1	0.1	0.1	0.8	0.4	2.4	5.8	4.6	58.6	1.7	17.4
	Bt2	27-41	0.15	5.2	4	0.9	1.2	0.2	0.1	1.0	0.4	2.3	4.7	3.8	51.1	2.1	26.3
	B/E	41-47	0.21	5.1	5	0.2	1.1	0.1	0.1	1.4	2.2	3.6	5.1	5.1	29.4	2.0	27.5
	B't	47-67	0.12	5.0	3	0.1	1.3	0.2	0.1	4.2	0.8	4.2	5.9	6.7	28.8	1.7	62.7
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	32.2[2]	---	---
Ruston fine sandy loam:[7] (S90LA-111-4)	A	0-4	0.20	5.2	16	0.8	0.2	0.0	0.0	0.0	0.6	5.2	6.2	1.6	16.1	0.0	0.0
	E	4-12	0.08	5.2	11	0.4	0.2	0.0	0.0	0.0	0.6	3.0	3.6	1.2	16.7	0.0	0.0
	Bt1	12-27	0.01	4.9	19	1.0	1.6	0.2	0.0	1.6	0.8	9.6	12.4	5.2	22.6	0.0	30.8
	Bt2	27-41	0.01	4.9	16	0.4	1.5	0.1	0.0	1.0	1.0	8.9	10.9	4.0	18.3	0.0	25.0
	B/E	41-47	0.10	4.9	16	0.3	1.2	0.2	0.0	1.4	0.4	8.1	9.8	3.5	17.3	0.0	40.0
	B't1	47-68	0.10	4.9	17	0.2	1.5	0.2	0.0	4.6	0.6	8.9	10.8	7.1	17.6	0.0	64.8
	B't2	68-93	0.10	4.7	19	0.2	1.0	0.0	0.1	3.2	0.8	8.1	9.4	5.3	13.8	1.1	60.4
Ruston fine sandy loam:[8] (S90LA-111-5)	A	0-5	0.26	4.7	7	0.3	0.1	0.1	0.0	1.0	0.4	2.1	2.6	1.9	19.2	0.0	52.6
	E	5-12	0.01	4.8	5	0.3	0.2	0.0	0.0	0.0	0.8	2.2	2.7	1.3	18.5	0.0	0.0
	Bt1	12-29	0.01	4.6	9	0.7	1.4	0.2	0.0	3.0	0.6	6.7	9.0	5.9	25.6	0.0	50.8
	B/E	29-39	0.05	4.6	8	0.2	1.5	0.1	0.0	2.2	0.0	6.0	7.8	4.0	23.1	0.0	55.0
	B't1	39-73	0.01	4.6	6	0.2	1.0	0.1	0.0	3.8	0.2	7.4	8.7	5.3	14.9	0.0	71.7
	B't2	73-86	0.01	4.9	6	0.2	0.8	0.1	0.0	4.0	0.6	7.3	8.4	5.7	13.1	0.0	70.2
	B't3	86-91	0.20	4.6	8	0.2	0.8	0.1	0.0	4.0	0.2	7.4	8.5	5.3	12.9	0.0	75.5
Sacul fine sandy loam:[1] (S89LA-111-12)	A	0-3	1.39	5.0	7	1.8	0.8	0.1	0.1	0.0	1.2	10.2	13.0	4.0	21.5	0.8	0.0
	E	3-8	0.46	4.8	4	1.0	0.7	0.0	0.1	1.6	0.4	1.2	3.0	3.8	60.0	3.3	42.1
	Bt1	8-19	0.43	5.1	7	1.9	2.9	0.2	0.1	8.8	0.6	13.8	18.9	14.5	27.0	0.5	60.7
	Bt2	19-28	0.30	4.8	7	1.2	4.1	0.2	0.3	13.8	1.4	21.6	27.4	21.0	21.2	1.1	65.7
	Bt3	28-40	0.13	4.8	7	0.9	5.0	0.2	0.5	15.0	2.4	18.0	24.6	24.0	26.8	2.0	62.5
	Bt4	40-52	0.11	4.9	8	0.9	5.6	0.2	0.5	14.6	0.6	18.6	25.8	22.4	27.9	1.9	65.2
	BCg	52-65	0.14	4.9	6	1.2	6.0	0.2	0.6	12.4	0.4	18.0	26.0	20.8	30.8	2.3	59.6
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See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Effective cation-exchange capacity Al
		In	Pct		Ppm	---------Milliequivalents/100 grams of soil---------									Pct	Pct	Pct
Savannah fine sandy loam:[1] (S91LA-111-13)	A1	0-5	1.58	5.1	8	0.5	0.4	0.1	0.0	0.0	1.2	7.2	8.2	2.2	12.2	0.0	0.0
	A2	5-8	0.96	5.4	5	0.5	0.5	0.1	0.0	0.0	1.4	3.6	4.7	2.5	23.4	0.0	0.0
	E	8-13	0.50	5.0	4	0.3	0.4	0.1	0.0	0.0	1.4	4.8	5.6	2.2	14.3	0.0	0.0
	Bt1	13-19	0.29	4.7	8	0.2	0.5	0.1	0.0	2.2	0.2	4.2	5.0	3.2	16.0	0.0	68.7
	Bt2	19-26	0.23	4.7	10	0.2	0.8	0.1	0.0	2.4	0.0	8.4	9.5	3.5	11.6	0.0	68.6
	Btx1	26-33	0.45	4.7	12	0.3	0.9	0.1	0.1	2.4	0.8	6.4	7.8	4.6	17.9	1.3	52.2
	Btx2	33-50	0.30	4.7	11	0.2	0.7	0.1	0.0	2.2	1.2	5.4	6.4	4.4	15.6	0.0	50.0
	Btx3	50-60	0.41	4.8	17	0.2	0.7	0.1	0.1	2.4	1.4	7.2	8.3	4.9	13.3	1.2	49.0
Savannah fine sandy loam:[9] (S89LA-111-13)	A	0-6	0.70	5.1	18	0.9	0.3	0.1	0.1	0.0	0.8	1.2	2.6	2.2	53.8	3.8	0.0
	BA	6-12	0.52	4.8	6	1.0	0.2	0.1	0.1	0.0	0.6	1.8	3.2	2.0	43.8	3.1	0.0
	Bt1	12-22	0.11	5.9	5	2.2	0.7	0.1	0.5	0.0	0.8	1.7	5.2	4.3	67.3	9.6	0.0
	Bt2	22-32	0.24	6.4	6	2.2	1.1	0.1	0.5	1.0	0.8	3.6	7.5	5.7	52.0	6.7	17.5
	Btx1	32-41	0.15	5.8	5	1.7	0.8	0.1	0.3	3.0	0.4	4.8	7.7	6.3	37.7	3.9	47.6
	Btx2	41-50	0.21	5.6	4	1.7	0.7	0.1	0.4	3.8	0.2	5.4	8.3	6.9	34.9	4.8	55.1
	Btx3	50-58	0.09	5.4	5	1.5	1.9	0.1	0.8	7.4	0.2	9.6	13.9	11.9	30.9	5.8	62.2
	B't	58-65	0.05	5.4	5	1.8	2.2	0.1	0.9	6.0	0.4	7.8	12.8	11.4	39.1	7.0	52.6
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Sawyer silt loam:[1] (S89LA-111-15)	A	0-9	1.15	4.7	9	0.6	0.2	0.1	0.1	1.2	1.4	4.2	5.2	3.6	19.2	1.9	33.3
	Bt1	9-22	0.28	4.7	7	0.7	1.1	0.1	0.1	6.8	0.4	9.6	11.6	9.2	17.2	0.9	73.9
	Bt2	22-35	0.40	4.8	7	0.4	1.1	0.1	0.2	8.0	0.2	8.4	10.2	10.0	17.6	2.0	80.0
	Btg1	35-53	0.11	5.0	7	1.1	3.0	0.1	0.5	9.4	0.6	10.8	15.5	14.7	30.3	3.2	63.9
	Btg2	53-60	0.12	5.2	8	1.7	3.8	0.1	0.7	10.0	0.2	11.2	17.5	16.5	36.0	4.0	60.6
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Smithdale fine sandy loam:[1] (S90LA-111-1)	A	0-8	1.12	4.8	27	2.4	0.1	0.1	0.0	3.0	3.4	9.6	12.5	9.3	23.2	0.0	32.3
	E	8-16	0.14	5.2	8	0.8	0.1	0.1	0.0	1.0	7.4	5.2	6.3	9.5	17.5	0.0	10.5
	BE	16-24	0.01	4.8	6	0.5	0.1	0.1	0.0	0.0	0.6	6.7	7.6	1.5	11.8	0.0	0.0
	Bt1	24-30	0.01	4.9	9	0.7	0.2	0.2	0.0	1.0	1.0	8.1	10.3	4.2	21.4	0.0	23.8
	Bt2	30-40	0.01	4.9	10	0.7	0.2	0.2	0.0	1.6	0.4	8.0	9.8	3.8	18.4	0.0	42.1
	Bt3	40-60	0.01	5.0	15	0.7	0.1	0.1	0.0	0.0	0.8	8.0	9.6	2.4	16.7	0.0	0.0
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See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Exchangeable cations: Mg	Exchangeable cations: K	Exchangeable cations: Na	Exchangeable cations: Al	Exchangeable cations: H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Saturation: Effective cation-exchange capacity Al
		In	Pct		Ppm	---------Milliequivalents/100 grams of soil---------									Pct	Pct	Pct
Smithton fine sandy loam:[1] (S91LA-111-10)	A	0-5	1.0	4.6	8	0.3	0.1	0.0	0.0	1.0	0.8	1.7	2.1	2.2	19.0	0.0	45.5
	Eg	5-14	0.35	4.8	6	0.3	0.1	0.0	0.0	1.0	0.6	3.0	3.4	2.0	11.8	0.0	50.0
	Btg1	14-25	0.20	5.1	6	0.5	0.2	0.0	0.2	1.2	0.6	4.4	5.3	2.7	17.0	3.8	44.4
	Btg2	25-32	0.04	4.8	8	1.1	0.6	0.0	1.0	2.4	2.0	6.7	9.4	7.1	28.7	10.6	33.8
	Btg3	32-39	0.03	4.6	8	0.9	0.6	0.0	1.4	2.4	1.6	6.7	9.6	6.9	30.2	14.6	34.8
	Btg4	39-60	0.00	4.3	9	1.0	1.0	0.1	2.4	6.0	0.8	10.8	15.3	11.3	29.4	15.7	53.1
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Sterlington silt loam:[1] (S89LA-111-3)	A	0-3	1.19	4.7	32	1.4	0.5	0.1	0.0	0.6	1.2	1.8	3.8	3.8	52.6	0.0	15.8
	E	3-10	0.41	5.2	48	1.1	0.4	0.1	0.0	0.8	0.8	4.8	6.4	3.2	25.0	0.0	25.0
	Bt	10-18	0.25	4.9	168	1.0	1.2	0.1	0.0	3.6	0.6	7.2	9.5	6.5	24.2	0.0	55.4
	B/E	18-25	0.12	5.0	223	1.1	1.5	0.1	0.0	2.8	1.4	6.0	8.7	6.9	31.0	0.0	40.6
	B't	25-42	0.18	5.0	288	2.1	2.8	0.2	0.1	5.4	0.2	8.4	13.6	10.8	38.2	0.7	50.0
	C	42-60	0.07	5.5	205	3.1	4.1	0.4	0.5	1.4	0.6	6.6	14.7	10.1	55.1	3.4	13.9
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Trep loamy fine sand:[1] (S91LA-111-8)	Ap	0-5	0.65	5.2	9	0.2	0.1	0.0	0.0	0.6	0.4	2.2	2.5	1.3	12.0	0.0	46.2
	E1	5-16	0.15	5.3	6	0.1	0.0	0.0	0.0	0.4	0.4	3.7	3.8	0.9	2.6	0.0	44.4
	E2	16-34	0.03	5.2	5	0.1	0.0	0.0	0.0	0.2	0.6	1.7	1.8	0.9	5.6	0.0	22.2
	Bt1	34-46	0.04	5.2	7	0.5	1.1	0.1	0.0	1.4	0.6	4.4	6.1	3.7	27.9	0.0	37.8
	Bt2	46-60	0.03	5.2	7	0.3	1.8	0.2	0.0	3.4	1.0	7.4	9.7	6.7	23.7	0.0	50.7
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Warnock fine sandy loam:[1] (S91LA-111-8)	A1	0-5	2.15	4.9	11	0.6	0.2	0.1	0.0	1.6	0.8	8.1	9.0	3.3	10.0	0.0	48.5
	A2	5-9	1.04	5.2	9	0.4	0.1	0.0	0.0	0.4	0.8	4.4	4.9	1.7	10.2	0.0	23.5
	E	9-15	0.18	5.4	6	0.5	0.3	0.0	0.0	0.4	0.6	3.0	3.8	1.8	21.1	0.0	22.2
	Bt1	15-28	0.11	5.4	8	1.4	0.9	0.1	0.0	0.4	0.6	4.4	6.8	3.4	35.3	0.0	11.8
	Bt2	28-38	0.11	5.5	9	1.7	0.8	0.1	0.0	0.6	1.4	3.7	6.3	4.6	41.3	0.0	13.0
	Bt3	38-47	0.05	5.5	9	1.6	1.2	0.1	0.0	0.8	0.8	3.5	6.4	4.5	45.3	0.0	17.8
	Btx1	47-56	0.00	5.0	6	0.2	1.1	0.1	0.0	1.8	0.6	5.9	7.3	3.8	19.2	0.0	49.4
	Btx2	56-60	0.03	5.2	6	0.4	1.3	0.1	0.0	1.6	1.6	6.0	7.8	5.0	23.1	0.0	32.0
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11.3[2]	---	---

See footnotes at end of table.

TABLE 16.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

(Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. Dashes indicate data is not available.)

Soil name and sample number	Horizon	Depth	Organic matter content	pH 1:1 H_2O	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Cation-exchange capacity (sum)	Cation-exchange capacity (effective)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Effective cation-exchange capacity Al
		In	Pct		Ppm	---------Milliequivalents/100 grams of soil---------									Pct	Pct	Pct
Wrightsville silt loam:[1] (S89LA-111-6)	A	0-4	2.39	4.6	10	2.8	0.3	0.0	0.1	1.0	0.2	7.8	11.0	4.4	29.1	0.9	22.7
	Eg1	4-12	0.79	5.1	9	2.8	0.4	0.0	0.1	1.0	1.4	4.8	8.1	5.7	40.7	1.2	17.5
	Eg2	12-19	0.36	4.5	6	0.6	0.8	0.1	0.1	7.4	0.8	13.2	14.8	9.8	10.8	0.7	75.5
	B/E	19-31	0.30	4.6	8	1.0	2.4	0.2	0.5	13.8	0.2	19.8	23.9	18.1	17.2	2.1	76.2
	Btg1	31-49	0.29	4.3	6	1.5	3.2	0.1	0.9	12.0	1.8	15.6	21.3	19.5	26.8	4.2	61.5
	Btg2	49-60	0.16	4.1	6	2.5	3.9	0.1	1.3	10.8	1.0	12.6	20.4	19.6	38.2	6.4	55.1
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	46.6[2]	---	---
SND[10] (S91LA-111-3)	A	0-5	3.78	5.1	9	2.9	0.8	0.2	0.0	0.8	0.6	11.1	15.0	5.3	26.0	0.0	15.1
	E/B	5-10	0.72	5.5	5	2.5	2.4	0.3	0.0	3.8	0.2	11.8	17.0	9.2	30.6	0.0	41.3
	Bt1	10-26	0.29	5.1	8	0.8	4.1	0.5	0.0	12.2	0.2	23.7	29.1	17.8	18.6	0.0	68.5
	Bt2	26-36	0.10	5.2	6	0.2	3.4	0.5	0.1	14.8	0.0	22.9	27.1	19.0	15.5	0.4	77.9
	Bt3	36-45	0.00	5.3	7	0.2	2.2	0.4	0.1	14.6	0.0	22.9	25.8	17.5	11.2	0.4	83.4
	BC	45-50	0.00	5.1	8	0.2	1.5	0.4	0.1	14.6	0.2	22.2	24.4	17.0	9.0	0.4	85.9
	C	50-60	0.00	5.1	6	0.2	1.1	0.3	0.1	15.6	0.0	22.9	24.6	17.3	6.9	0.4	90.2

[1] Typical pedon for the survey area. For the description and location, see the section "Soil Series and Their Morphology."

[2] This is the base saturation at the critical depth to classify the soil at the Order level.

[3] This Boykin pedon is located about one mile southeast of Downsville; 3,350 feet north and 125 feet west of the southeast corner of sec. 30, T. 19 N., R. 1 E.; USGS topographic quadrangle Downsville South, latitude 32 degrees, 36 minutes, 21 seconds N., longitude 92 degrees, 23 minutes, 54 seconds W.

[4] This Darley pedon is located about 4.7 miles west of Crossroads; 990 feet west and 1,600 feet south of the northeast corner of sec. 7, T. 20 N., R. 2 E.

[5] This Frizzell pedon is located about 4 miles southeast of Haile; 1,900 feet south and 625 feet west of the northeast corner of sec. 26, T. 21 N., R. 3 E.

[6] This Malbis pedon is located in the SE1/4NE1/4 of sec. 14, T. 22 N., R. 1 E.

[7] This Ruston pedon is located in the SE1/4SW1/4 of sec. 6, T. 22 N., R. 1 E.

[8] This Ruston pedon is located in the SE1/4SW1/4 of sec. 6, 300 feet east of pedon in footnote number 7, T. 22 N., R. 1 E.

[9] This Savannah pedon is located within the city limits of Marion, 25 feet south, 700 feet east of the northwest corner of sec. 14, T. 22 N., R. 2 E.; USGS topographic quadrangle Marion East, latitude 32 degrees, 54 minutes, 09 seconds N., longitude 92 degrees, 14 minutes, 22 seconds W.

[10] Series not designated. This pedon is located about 2 miles north and 2 miles west of Bernice; sec. 29, T. 22 N., R. 3 W.; USGS topographic quadrangle Bernice, latitude 32 degrees, 52 minutes, 09 seconds N., longitude 92 degrees, 42 minutes, 07 seconds W. This soil is an included soil in map unit ED, Eastwood very fine sandy loam, 5 to 12 percent slopes.

TABLE 17.--PHYSICAL TEST DATA FOR SELECTED SOILS

(Dashes indicate analyses not made)

Soil name and sample number	Horizon	Depth	Particle-size distribution: Total (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Water content: 1/3 bar	15 bar	Water retention
		In	Pct	Pct	Pct	Pct (wt)	Pct (wt)	Pct (wt)
Ruston fine sandy loam:[1]	Ap	0-4	76.8	20.2	3.0	---	---	---
(S64LA56-1)	E1	4-12	68.0	28.2	3.8	9.66	0.73	8.93
	E2	12-16	63.0	31.2	5.8	11.75	1.49	10.26
	Bt1	16-27	58.6	16.0	25.4	18.06	8.12	10.94
	Bt2	27-36	72.2	14.6	13.2	10.37	4.16	6.21
	B/E	36-47	76.3	13.1	10.6	9.49	3.15	6.34
	B't3	47-66	65.4	8.6	26.0	17.01	9.03	7.99

[1] This pedon is about 4 miles north of Downsville, 280 feet north of Mount Nebo Church, 120 feet west of center of highway; NW1/4NW1/4 sec. 32, T. 20 N., R. 1 E.

TABLE 18.--CHEMICAL TEST DATA FOR SELECTED SOILS

(Dashes indicate analyses not made. TR indicates trace amounts of element)

Soil name and sample number	Horizon	Depth	Extractable cations: Ca	Mg	K	Na	Cation-exchange capacity (NH₄OAc)	Base saturation (NH₄OAc)	Organic carbon	pH 1:1 H_2O	pH 1:2 $CaCl_2$	Extractable hydrogen
		In	Meq/100g	Meq/100g	Meq/100g	Meq/100g	Pct	Pct	Pct			Meq/100g
Ruston fine sandy loam:[1]	Ap	0-4	0.2	0.1	TR	0.1	1.7	22	0.89	5.3	---	1.3
(S64LA-56-1)	E1	4-12	0.2	TR	0.1	0.1	1.0	40	0.20	5.5	4.8	0.7
	E2	12-16	0.5	0.3	TR	0.1	1.9	47	0.20	5.3	4.9	1.0
	Bt1	16-27	2.8	2.9	TR	0.2	8.2	73	0.37	5.2	4.5	2.2
	Bt2	27-36	0.6	1.3	TR	0.1	4.2	48	0.11	5.2	4.5	2.2
	B/E	36-47	0.6	1.7	0.1	0.1	3.2	75	0.16	5.6	4.7	0.7
	B't3	47-66	0.4	2.4	0.1	0.1	7.4	41	0.16	5.0	4.2	4.4

[1] This pedon is about 4 miles north of Downsville, 280 feet north of Mount Nebo Church, 120 feet west of center of highway; NW1/4NW1/4 sec. 32, T. 20 N., R. 1 E.

TABLE 19.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Angie	Clayey, mixed, thermic Aquic Paleudults
Betis	Sandy, siliceous, thermic Psammentic Paleudults
Bienville	Sandy, siliceous, thermic Psammentic Paleudalfs
Bowie	Fine-loamy, siliceous, thermic Plinthic Paleudults
Boykin	Loamy, siliceous, thermic Arenic Paleudults
Briley	Loamy, siliceous, thermic Arenic Paleudults
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
Darley	Clayey, kaolinitic, thermic Typic Hapludults
Eastwood	Fine, montmorillonitic, thermic Vertic Hapludalfs
Frizzell	Coarse-silty, siliceous, thermic Glossaquic Hapludalfs
Groom	Fine-silty, siliceous, thermic Aeric Ochraqualfs
Guyton	Fine-silty, siliceous, thermic Typic Glossaqualfs
Haggerty	Coarse-loamy, siliceous, thermic Aeric Ochraquults
Harleston	Coarse-loamy, siliceous, thermic Aquic Paleudults
Hebert	Fine-silty, mixed, thermic Aeric Ochraqualfs
Iuka	Coarse-loamy, siliceous, acid, thermic Aquic Udifluvents
Kirvin	Clayey, mixed, thermic Typic Hapludults
Libuse	Fine-silty, siliceous, thermic Typic Fragiudalfs
Litro	Fine, mixed, acid, thermic Vertic Haplaquepts
Mahan	Clayey, kaolinitic, thermic Typic Hapludults
Malbis	Fine-loamy, siliceous, thermic Plinthic Paleudults
McLaurin	Coarse-loamy, siliceous, thermic Typic Paleudults
Ochlockonee	Coarse-loamy, siliceous, acid, thermic Typic Udifluvents
Ora	Fine-loamy, siliceous, thermic Typic Fragiudults
Ouachita	Fine-silty, siliceous, thermic Fluventic Dystrochrepts
Perry	Very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Portland	Very-fine, mixed, nonacid, thermic Vertic Haplaquepts
Ruston	Fine-loamy, siliceous, thermic Typic Paleudults
Sacul	Clayey, mixed, thermic Aquic Hapludults
Savannah	Fine-loamy, siliceous, thermic Typic Fragiudults
Sawyer*	Fine-silty, siliceous, thermic Aquic Paleudults
Smithdale	Fine-loamy, siliceous, thermic Typic Hapludults
Smithton	Coarse-loamy, siliceous, thermic Typic Paleaquults
Sterlington	Coarse-silty, mixed, thermic Typic Hapludalfs
Trep	Loamy, siliceous, thermic Arenic Paleudults
Warnock	Fine-loamy, siliceous, thermic Typic Paleudults
Wrightsville	Fine, mixed, thermic Typic Glossaqualfs

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