SOIL SURVEY OF

Oktibbeha County, Mississippi

United States Department of Agriculture
Soil Conservation Service
and Forest Service
In cooperation with
Mississippi Agricultural Experiment Station

Issued July 9, 1973

Major fieldwork for this soil survey was done in the period 1959–67. Soil names and descriptions were approved in 1968. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1967. This survey was made cooperatively by the Department of Agriculture, Soil Conservation Service and Forest Service, and the Mississippi Agricultural Experiment Station. It is part of the technical assistance furnished to the Oktibbeha County Soil Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Oktibbeha County are shown on the detailed map at the back of this survey. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetical order by map symbol. It indicates the page where each kind of soil is described and the page for the capability unit. It also gives the woodland group and wildlife group in which each soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of capability units, woodland groups, and wildlife groups.

Foresters and others can refer to the section "Use of Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of Soils for Wildlife".

Engineers and builders can find, under "Use of Soils for Engineering," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of Soils."

Newcomers in Oktibbeha County may be especially interested in the section, "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given at the beginning of the publication and in the section "Additional Facts About the County."

Cover: Angus cattle grazing Coastal bermudagrass on Kipling silty clay loam, 0 to 2 percent slopes.

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SOIL SURVEY OF OKTIBBEHA COUNTY, MISSISSIPPI

BY FLOYD V. BRENT, JR.

FIELDWORK BY FLOYD V. BRENT, JR. AND LELAND C. MURPHREE, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE AND FOREST SERVICE, IN COOPERATION WITH THE MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

OKTIBBEHA COUNTY is located in the east-central part of Mississippi (fig. 1) and has a land area of 290,560 acres, or 454 square miles. Starkville, the county seat, is the largest town in the county. Mississippi State University and the Mississippi Agricultural Experiment Station are located 1½ miles east of Starkville. Enrollment at the university in 1968 was 8,498.

Dairying, raising of beef cattle, and tree farming are the main enterprises. Cotton, once the leading crop, was planted on less than 2,000 acres in 1967.

How This Survey Was Made

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

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures (*9*).[1] The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

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

[1] Italic numbers in parentheses refer to Literature Cited, p. 93.

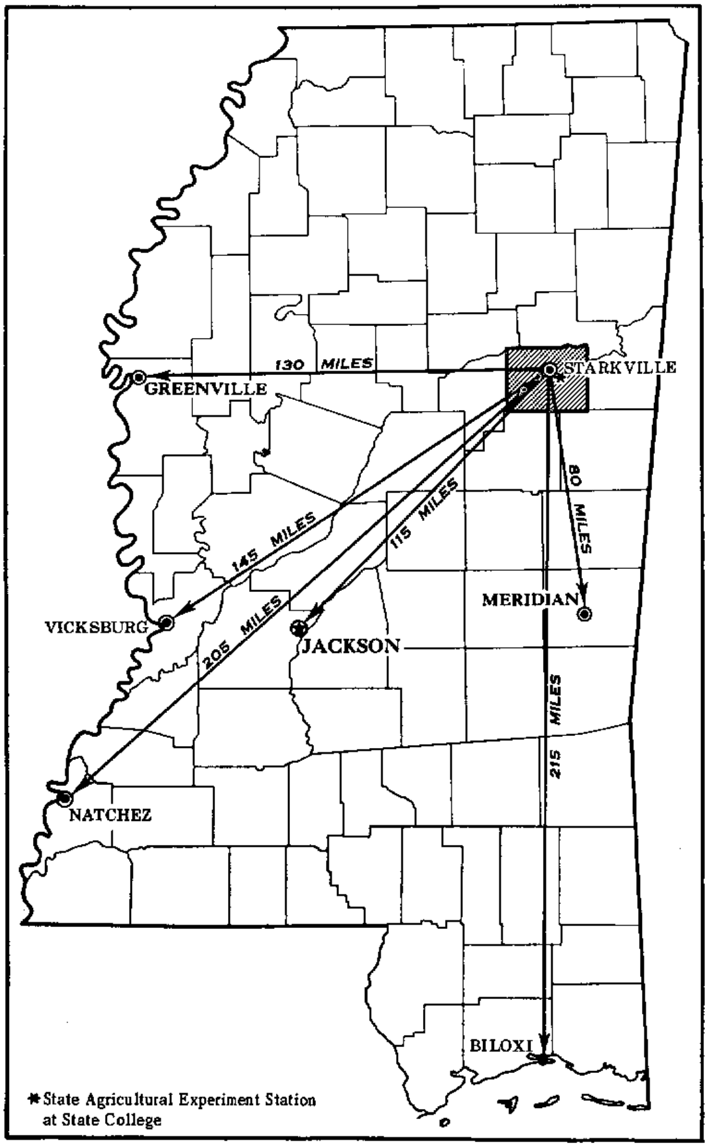

Figure 1.—Location of Oktibbeha County in Mississippi.

series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Kipling silty clay loam, 0 to 2 percent slopes, is one of several phases within the Kipling series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Oktibbeha County, soil complexes and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Gullied land-Sumter complex, 5 to 20 percent slopes, is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Maben and Ruston soils, 12 to 30 percent slopes, is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Gullied land is a land type in Oktibbeha County.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Oktibbeha County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The 10 soil associations in Oktibbeha County are discussed in the following pages.

Areas on Flood Plains Dominated by Nearly Level Soils

Three soil associations in the county are made up of nearly level soils that are subject to flooding. These soils are in fairly narrow bands along small streams scattered through all parts of the county.

1. Leeper-Marietta-Catalpa association

Somewhat poorly drained to moderately well drained, nonacid soils that have dominantly a clayey to loamy subsoil

This association is on wide flood plains along Sand Creek, Catalpa Creek, and the south side of Trim Cane Creek, in the eastern one-third of the county. It consists of nearly level soils that formed in recent alkaline clayey alluvium derived from the prairie section, and in mixed loamy and clayey, slightly acid to alkaline.

recent alluvium derived from the prairie and coastal plain uplands.

This association occupies about 8 percent of the county. Leeper soils make up about 50 percent of the association, Marietta soils about 25 percent, Catalpa soils about 20 percent, and minor soils about 5 percent.

The Leeper soils are somewhat poorly drained. They have a very dark grayish-brown silty clay loam surface layer about 5 inches thick that is underlain to a depth of 9 inches by very dark gray silty clay. This layer of silty clay is underlain, to a depth of 42 inches, by clay or silty clay loam mottled in shades of gray and brown.

The Marietta soils are moderately well drained. They have a dark grayish-brown fine sandy loam surface layer about 6 inches thick that overlies yellowish-brown loam to about 15 inches. The next layer, to a depth of about 55 inches, is sandy clay loam mottled with shades of brown and gray.

The Catalpa soils are moderately well drained to somewhat poorly drained. They have a very dark grayish-brown silty clay loam surface layer about 9 inches thick that is underlain by dark grayish-brown or very dark grayish-brown silty clay or clay loam to a depth of about 26 inches. The next layer is mottled clay or silty clay.

Some of the largest farms in the county are in this association. They range from about 80 acres to 500 acres in size. They are mainly dairy and beef farms, but a few large tracts have been planted to soybeans in the past 2 or 3 years. Most of this association is used for silage crops, hay, pasture, small grains, and soybeans, but minor areas are used for cotton. Only small areas remain in hardwoods.

Flooding limits the use of these soils to some extent, but with proper drainage, they are well suited to cotton, corn, soybeans, grain sorghum, and small grains, and to most of the commonly grown pasture plants.

2. *Mathiston-Urbo association*

Somewhat poorly drained, acid soils that have a loamy to clayey subsoil

This association is on wide flood plains in the north-central part of the county along Sun Creek; in the northern and western parts of Trim Cane Creek; and in the south-central part of the county along the Noxubee River, Sand Creek, Cypress Creek, Chinchahoma Creek, the Talking Warrior River, and Oktoc Creek. The width of this association ranges from one-eighth mile to one and one-half miles. It consists of nearly level soils that have formed in recent silty and clayey alluvium.

The association occupies about 10 percent of the county. Mathiston soils make up about 55 percent of it; Urbo soils about 35 percent; and minor soils about 10 percent.

The Mathiston soils are somewhat poorly drained. They have a dark-brown silt loam surface layer about 6 inches thick that is underlain to a depth of about 14 inches by dark-brown silt loam. The next layer, to a depth of 39 inches, is grayish-brown silt loam. Below this layer, to a depth of 52 inches, is silty clay loam.

The Urbo soils are somewhat poorly drained. They have a dark-brown silty clay loam surface layer about 5 inches thick. Below the surface layer, to a depth of 55 inches, is silty clay that is dark grayish brown or grayish brown in the upper part and light brownish gray in the lower part.

The minor soils of this association are the somewhat poorly drained Mantachie and the well-drained Ochlockonee soils.

Most farms in this association are 80 to 150 acres in size. Some large tracts in the southern part of the county are controlled by the Noxubee Wildlife Refuge and the Mississippi State University Forestry Department. The Noxubee Wildlife Refuge has about 6,000 acres in this association and 9,880 acres on adjoining associations. The Mississippi State University Forestry Department has 5,741 acres on this and adjoining associations.

The farms are mostly of the general type, but there are also dairy farms, beef farms, and tree farms. A few larger farms have been planted in soybeans and small grains in recent years. The general farms produce cotton, corn, small grains, hay, and vegetables.

Flooding limits the use of the soils in this association in most areas. If they are adequately drained, they are suited to many of the commonly grown row crops and pasture plants. Undrained areas are well suited to hardwoods. Approximately half of this association has remained in hardwood forests.

3. *Mantachie-Mathiston-Ochlockonee association*

Somewhat poorly drained to well-drained, acid soils that have a loamy subsoil

This association is on wide flood plains along the Noxubee River and Sand Creek in the southwestern part of the county. It ranges from about 1/4 to 1 mile in width and consists of nearly level soils that have formed in recent loamy alluvium.

The association occupies about 2 percent of the county. Mantachie soils make up about 50 percent of it, Mathiston about 25 percent, Ochlockonee about 20 percent, and minor soils about 5 percent.

The Mantachie soils are somewhat poorly drained. They have a mottled dark-brown, yellowish-brown, and grayish-brown loam surface layer about 8 inches thick that is underlain to a depth of about 19 inches by mottled yellowish-brown and light brownish-gray loam. The next layer, to a depth of about 60 inches, is light-gray or light brownish-gray loam.

The Mathiston soils are somewhat poorly drained. They have a dark-brown silt loam surface layer about 6 inches thick that is underlain to a depth of about 14 inches by dark-brown silt loam. The next layer, to a depth of 39 inches, is grayish-brown silt loam. Below this layer, to a depth of about 52 inches, is silty clay loam.

The Ochlockonee soils are well drained. They have a dark-brown loam surface layer about 7 inches thick that is underlain to a depth of about 28 inches by yellowish-brown sandy loam. The next layer, to a depth of about 52 inches, is loam mottled with shades of brown and gray.

The farms in this association are of average size for the county. They range from 100 to 200 acres and extend onto adjoining soil associations. The farms are mostly of the general type, but some produce corn that is fed to beef cattle and hogs. Corn, cotton, small grains, pasture, and hay are grown on this association. Most farms have a vegetable garden for home use.

The soils of this association have some limitations caused by flooding. If protected and adequately drained, they are well suited to most of the commonly grown row crops and pasture plants. The undrained areas are well suited to hardwood forest. Approximately one-fourth of this association is wooded.

Areas on Uplands Dominated by Unstable Soils Over Chalk

Three associations in the county are made up of unstable soils over chalk. These soils formed mainly in clays underlain by chalk or marl.

4. Kipling-Savannah-Oktibbeha association

Somewhat poorly drained to moderately well drained soils that have dominantly a clayey subsoil that developed from chalk, and moderately well drained soils that have a loamy subsoil and a fragipan

This association occurs on gently sloping ridgetops and moderately steep side slopes in the eastern half of the county. It consists of soils formed from a mixture of clays and loamy materials. Most areas of this association have been dissected by many intermittent streams. The side slopes between the ridges and flood plains are fairly long, range from 200 to 600 feet in width, and ordinarily have a gradient of less than 17 percent. Many of the ridgetops are less than one-eighth mile wide, but in some places the ridgetops and side slopes have a gradient of less than 8 percent and are up to one-fourth mile wide. The flood plains are generally less than one-fourth mile wide.

This association occupies about 21 percent of the county. Kipling soils make up about 35 percent of the association, Savannah soils about 16 percent, and Oktibbeha soils about 16 percent. Leeper and Marietta soils are on the flood plains and make up less than 10 percent of the association. The rest is made up of Sumter, Houston, and Freestone soils.

The Kipling soils are on ridgetops and side slopes. They are somewhat poorly drained soils. They have a brown silty clay loam surface layer about 5 inches thick that is underlain to a depth of 9 inches by yellowish-brown silty clay loam. The next layer, to a depth of about 54 inches, is silty clay mottled with shades of red, brown, and gray. The underlying material is firm chalk.

The Savannah soils occur mainly on narrow ridgetops and side slopes. They are moderately well drained soils that have a fragipan. Their dark grayish-brown fine sandy loam surface layer is about 4 inches thick. It is underlain at a depth of 22 inches by a strong-brown loam subsoil. Below this layer is yellowish-brown loam mottled in shades of gray and brown.

The Oktibbeha soils are on ridgetops, some of them knoll-shaped, that are 2 to 10 acres in size. They are also on some of the moderately steep side slopes, generally on the upper two-thirds of the slope. They are moderately well drained soils that have a dark grayish-brown silty clay loam surface layer about 4 inches thick, a yellowish-red to red clay subsoil reaching to a depth of about 16 inches, and mottled clay and chalk at a depth of about 45 inches.

Most of the less sloping areas in this association have been cultivated in the past but are now in pasture, hay, or silage. Most of the steeper slopes have remained as cutover woodland or as pasture. The flood plains are in cotton, corn, silage, and hay.

The farms of this association are larger than the average for the county, or 120 to 500 acres in size. Some of the largest dairy and beef farms in the county are in this association. Most of the farms are operated by the owner with help from families living on the farm. Mississippi State University is located in this association, as is most of the University's 2,700 acre experimental farm.

The ridgetop and flood plains are suited to cultivation, but erosion is a hazard on the ridges, and the flood plains are subject to flooding. Most of the commonly grown pasture plants are suited to the soils in this association.

5. Kipling-Sumter-Gullied land association

Somewhat poorly drained to well-drained soils that have dominantly a clayey subsoil that developed from chalk and that are severely gullied in some areas

This association occurs on strongly sloping to steep side slopes and sloping narrow ridgetops in the eastern one-third of Oktibbeha County. Most of the side slopes have been dissected by many short intermittent streams. Some areas have been dissected by many deep gullies or contain areas of chalk outcrop. The side slopes from the ridges down to the flood plains are long and are 200 to 600 feet in width. The flood plains are generally less than one-eighth of a mile wide. The soils of this association have formed mostly in acid to marly clays and firm chalk, but some of the soils on upper ridgetops have formed in loamy coastal plain material.

This association occupies about 4 percent of the county. Kipling soils make up about 27 percent of this association, Sumter soils about 26 percent, and Gullied land about 26 percent. Marietta and Leeper soils are on flood plains and make up less than 5 percent of the association. The rest is made up of Savannah soils on some of the upper ridgetops; Ruston soils on the upper one-third of a few side slopes; and Oktibbeha soils on ridgetops and side slopes.

The Kipling soils are sloping on the tops of ridges and steep on the sides of ridges. They are somewhat poorly drained soils. They have a light-brown silty clay loam surface layer about 5 inches thick that is underlain to a depth of about 9 inches by yellowish-brown silty clay loam. The next layer, to a depth of about 54 inches, is silty clay mottled in shades of red, brown, and gray. The underlying material is firm chalk.

The Sumter are sloping and strongly sloping soils on the tops of ridges and the side slopes. These soils are well drained. They have a dark grayish-brown silty clay loam surface layer about 5 inches thick that is underlain to a depth of about 20 inches by light yellowish-brown and pale-olive silty clay. The next layer, to a depth of about 34 inches, is gray marly clay. The underlying material is gray chalk.

The Gullied land part of this association is about 60 percent deep gullies that occur in an intricate pattern and are separated by fingerlike extensions of the original soil material. Some areas up to 2 acres in size have lost all soil material and consist only of firm chalk.

Many of the sloping, strongly sloping, and steep areas in this association have never been cleared. The areas of steep soil that have been cleared and row cropped have been damaged by severe sheet and gully erosion. Most of these severely eroded areas are reverting to cedar and bois d'arc trees or are in pasture. The areas of chalk outcrop are idle or support scattered patches of sweetclover or cedar trees. Some of the acid areas on the steep slopes have mixed stands of hardwood and pine timber.

The farms in this association are a little larger than average for the county. They range from 100 to 250 acres in size, and some extend onto the adjoining more productive flood plains. Most of the farms on this association are dairy or beef farms or tree farms. The sloping to strongly sloping soils are mostly in pasture or hay, and the soils on flood plains are in silage crops, hay, or pasture.

The ridgetops and flood plains are suited to cultivation, but erosion is a hazard on the ridges, and the bottoms are subject to flooding. Some parts of this association are suited to pine trees and adapted hardwoods.

6. *Kipling-Brooksville-Sumter association*

Somewhat poorly drained to well-drained, acid and alkaline soils that have a clayey subsoil or subsurface layer

This association occurs on broad nearly level to gently sloping uplands, mainly in the northeastern part of the county. It is dissected by a few shallow intermittent streams that have narrow flood plains.

This association occupies about 5 percent of the county. Kipling soils make up about 30 percent of this association, Brooksville soils about 24 percent, and the Sumter soils about 24 percent. A broad, nearly level area of Sessum soils, just southwest of Starkville, makes up about 16 percent of the association. The rest is made up of Houston and Binnsville soils.

The Kipling soils are somewhat poorly drained, nearly level and gently sloping soils in broad areas. They have a brown silty clay loam surface layer, about 5 inches thick, that is underlain to a depth of about 9 inches by yellowish-brown silty clay loam. The next layer, to a depth of about 54 inches, is silty clay mottled by shades of red, brown, and gray. The underlying material is firm chalk.

The Brooksville soils are somewhat poorly drained, nearly level and gently sloping soils in broad areas. They have a very dark grayish-brown surface layer about 6 inches thick, which overlies about 19 inches of very dark grayish-brown silty clay that has brownish mottles. Below this silty clay, and down to a depth of 37 inches, is clay mottled in shades of red, brown, and gray. The underlying material is olive clay that extends to a depth of 52 inches or more and is mottled in shades of brown.

The Sumter soils are generally gently sloping to sloping and are well drained. They have a dark grayish-brown silty clay loam surface layer, about 5 inches thick, that is underlain to a depth of 20 inches by light yellowish-brown and pale-olive silty clay. The next layer, to a depth of about 34 inches, is gray marly clay. The underlying material is gray chalk.

Some of the largest farms in the county are in this association. The farms range from about 100 acres to 500 acres in size. They are mainly dairy and beef farms. Most of this association is in pasture, hay, and silage. A few large tracts have been planted to soybeans. Some parts of the Kipling soils have remained in hardwoods.

This association is suited to cotton, soybeans, grain sorghum, and small grains, and to most of the commonly grown pasture plants. When some areas are row cropped, erosion is a hazard.

Areas on Uplands Dominated by Deep Soils

Two associations in the county are made up of deep soils on uplands. These soils formed in extremely acid to slightly acid material underlain mainly by shale.

7. *Maben-Ruston-Savannah association*

Well drained to moderately well drained soils that have dominantly a loamy subsoil

This association is on long side slopes and narrow, winding ridgetops along the western edge of the county. The slopes from the ridges down to the flood plains are up to a mile in length, and up to one-fourth mile in width, and ordinarily have a gradient of more than 17 percent. Most of the ridgetops are less than one-eighth mile wide. The flood plains range from 150 to 1,200 feet in width.

This association occupies about 9 percent of the county. Maben soils make up about 35 percent of this association, Ruston soils about 15 percent, and Savannah soils about 14 percent. Especially in the northern half of this association, some of the gently and moderately sloping ridgetops are occupied by Providence soils, which make up less than 10 percent of the total area of this association. Boswell soils on the uplands and Ochlockonee and Mantachie soils on the flood plains are minor soils in this association.

The Maben soils are mostly on the lower two-thirds of the side slopes but are also on a few of the ridgetops. The proportion of Maben soil in this association is greater north of Sturgis. Maben soils are well drained. They have a dark-brown fine sandy loam surface layer about 5 inches thick that is underlain to a depth of 23 inches by a yellowish-red clay or clay loam. The next layer, to a depth of about 41 inches, is red loam. The underlying material, to a depth of 60 inches, is stratified partly weathered grayish-brown shale and brownish-yellow fine sandy loam.

The Ruston soils are generally on the upper one-third of the side slopes and some of the narrow ridgetops. The percentage of Ruston soils is greater south of Sturgis, and in a few areas the entire slope is Ruston. The Ruston soils are well drained. They have a dark-brown fine sandy loam surface layer about 9 inches thick. The subsurface layer, to a depth of about 15 inches, is pale-brown sandy loam that is underlain, to a depth of about 32 inches, by yellowish-red sandy clay loam. The next layer, to a depth of about 55 inches, is strong-brown loam or sandy loam. Below this, to a depth of about 80 inches, is yellowish-red sandy loam becoming mottled with shades of yellow, red, and gray.

The Savannah soils are dominantly on the narrow ridgetops and on upper parts of a few of the side slopes. They are moderately well drained soils. They have a dark grayish-brown fine sandy loam surface layer about 4 inches thick that is underlain, to a depth of about 22 inches, by strong-brown loam. Below this is yellowish-brown loam, mottled in shades of gray and brown, that is firm, compact, and brittle and extends to a depth of more than 60 inches.

Most of the steep side slopes have remained as woodland. A few of the strongly sloping areas and upper rims of the steep side slopes have been row cropped and damaged by severe sheet and gully erosion. Most of these eroded areas are reverting to pine timber.

Most of the farms in this association are smaller than average for the county. Most of them are 40 to 200 acres in size, but there are a few larger tree farms. Most of the farms are general farms operated mainly on a part-time basis by the owner. The dominant crops are cotton, corn, and hay. These are grown in small fields. The row crops are mainly on the ridgetops and stream bottoms. Most of the farmers keep a few cows, have a vegetable garden for home use, and obtain part of their income by working off the farm.

The ridgetops and flood plains are suited to cultivation, but erosion is a hazard on the ridges, and the flood plains are subject to flooding. This association is well suited to pine trees and adapted hardwoods.

8. *Wilcox association*

Somewhat poorly drained soils that have dominantly a clayey subsoil

This association occurs in a long, irregular band between the hilly soils on the west side of the county and the gently sloping soils to the east. Long, narrow tongues of this association extend eastward into the Flatwoods sections on the south side of some of the major tributaries. This association is on moderately steep to steep side slopes and narrow, winding, sloping ridgetops. The slopes between the ridges and the narrow stream flood plains are generally short and in gradient range up to 35 percent. Most areas are dissected by many short, intermittent streams. The flood plains are generally less than 1,200 feet wide.

This association occupies about 8 percent of the county. Wilcox soils make up about 75 percent of it, and Boswell soils less than 10 percent. The rest is made up of Maben and Providence soils on the uplands and of Mathiston and Urbo soils on the flood plains.

The Wilcox are somewhat poorly drained soils on the side slopes and some of the ridgetops. These soils have a dark yellowish-brown silty clay loam surface layer about 4 inches thick that is underlain to a depth of 8 inches by yellowish-red silty clay. The next layer, to a depth of about 42 inches, is clay mottled with shades of red, gray, and brown. The underlying material is grayish shaly clay mottled with olive brown.

Most of the side slopes are wooded. A few of the sloping areas have been row cropped and damaged by sheet and gully erosion. Most of these eroded areas have been converted to pasture or allowed to revert to pine timber.

Most farms in this association are smaller than average for the county, but there are a few large tree farms that extend onto adjoining associations. The farms are mainly general farms operated part time by the owner. The dominant crops are cotton, corn, hay, and small grains. A vegetable garden is grown for home use. Most of the farms have a few cattle and produce pasture on a few of the steep slopes and ridgetops. The row crops are grown mainly on the ridgetops or flood plains. Some of the farmers obtain part of their income by working off the farm.

The ridgetops and flood plains are suited to cultivation, but erosion is a hazard on the ridges, and some of the flood plains are subject to flooding.

Areas on Uplands Dominated by Soils That Have a Fragipan

Two associations in the county are made up of soils that have fragipans or clayey layers in the subsoil. These soils formed in strongly acid to very strongly acid loamy and clayey deposits.

9. *Longview-Falkner-Prentiss association*

Somewhat poorly drained and moderately well drained soils that have a loamy to clayey subsoil

This association is in broad nearly level to gently sloping areas locally known as the "Flatwoods." It is principally in the western half of the county and extends westward to the Wilcox association. A distinguishing feature in some of this association is that the flood plains are bordered on the south by high broken bluffs and rolling areas and on the north by comparatively level lands not much above the flood plains. The rolling areas soon give way to gently sloping areas that gradually become more nearly level toward the next stream course to the south.

This association occupies about 25 percent of the county and is the largest in the county. Longview soils make up about 35 percent of this association, Falkner soils about 15 percent, and Prentiss soils about 15 percent. The rest is made up of Adaton, Providence, and Wilcox soils on the uplands and Mathiston soils on the flood plains.

The Longview are nearly level to gently sloping soils in areas up to 2 miles long and three-fourths mile wide. These areas are broken only by a few, shallow, intermittent streams. Longview soils are somewhat poorly drained. They have a grayish-brown silt loam surface layer about 4 inches thick that is underlain to a depth of about 18 inches by yellowish-brown silt loam mottled with shades of gray. The next layer, to a depth of about 55 inches, is firm, compact and brittle silt loam.

The Falkner are nearly level, somewhat poorly drained soils that are less extensive than Longview soils. They have a dark-brown silt loam surface layer about 6 inches thick. The subsoil is yellowish-brown silty clay loam that extends to a depth of 27 inches and is mottled in the lower part with gray, red, and brown. Below this is a clayey layer that extends to a depth of about 64 inches and is mottled with shades of red, brown, and gray. The underlying material is clay or shale in horizontal plates.

The Prentiss soils are nearly level to gently sloping and are on comparatively long, narrow terraces and uplands.

These soils are more extensive in the northern half of this association, where the landscape is dissected with more intermittent and permanent streams and the topography is more gently sloping. These soils are moderately well drained. They have a dark-brown silt loam surface layer, about 5 inches thick, that is underlain to a depth of 23 inches by yellowish-brown silt loam. The next layer, to a depth of about 52 inches, is firm, compact and brittle silt loam mottled with shades of brown, yellow, and gray. Below this is firm, compact and brittle silty clay loam mottled with shades of gray and brown.

The farms in this association are about average in size for the county. Most of them are 100 to 200 acres in size, but there are some larger tree farms. The Noxubee Wildlife Refuge and Mississippi State University Forestry Department have large tracts of woodland in the southern part of this association. The farms in this association are mainly of the general type, though there are some beef and dairy farms. The row crops are generally grown in the areas having good natural drainage or on the narrow flood plains. Most of the nearly level to level areas are wooded, and a few are in pasture. About three-fourths of this association is used as woodland.

10. Stough-Prentiss-Myatt association

Poorly drained to moderately well drained soils that have dominantly a loamy subsoil

This association is in broad, nearly level to gently sloping areas dissected in some places by intermittent streams and steep slopes. It is located mainly in the southern third of the county.

This association occupies about 8 percent of the county. Stough soils make up about 25 percent of this association, Prentiss soils about 22 percent, and Myatt soils about 8 percent. The Savannah and Wilcox soils on the side slopes make up less than 10 percent. The rest is made up of Longview soils on the flats and Mathiston soils on the flood plains.

The Stough soils are somewhat poorly drained, nearly level, and in broad areas. They have a brown fine sandy loam surface layer about 5 inches thick. The subsurface layer, to a depth of about 8 inches, is yellowish-brown fine sandy loam. It is underlain to a depth of about 18 inches by light yellowish-brown loam mottled with light brownish gray. The next layer, to a depth of about 60 inches, is compact, firm and brittle loam mottled with shades of brown and gray.

The Prentiss soils are moderately well drained and nearly level to gently sloping. They have a dark-brown silt loam surface layer about 5 inches thick that is underlain, to a depth of about 23 inches, by yellowish-brown silt loam. The next layer, to a depth of about 52 inches, is silt loam mottled with shades of brown, yellow, and gray that is firm, compact, and brittle. Below this layer, to a depth of about 60 inches, is silty clay loam that is mottled with shades of gray and brown and is firm, compact, and brittle.

The Myatt soils are poorly drained, nearly level, and on flats or in depressional areas. They have a gray loam surface layer. The subsurface layer is about 6 inches thick. It is loam to silt loam mottled with shades of gray and brown and is underlain, to a depth of about 38 inches, by light brownish-gray silt loam mottled with shades of brown. The next layer, to a depth of about 60 inches, is light-gray silt loam mottled with shades of brown.

The farms in this association are about average in size for the county. They range from 100 to 200 acres and extend onto the adjoining bottom land. The farms are mainly dairy farms and hog farms, but there are combination beef and hog farms. Most of the general farms produce cotton, corn, and hay and have a vegetable garden for home use. There are a few tree farms. The broad, nearly level to gently sloping areas are used for row crops, pasture, or hay. The narrow flood plains are mostly in cultivation or in pasture, and some areas have remained in hardwoods.

Descriptions of the Soils

This section describes the soil series and mapping units of Oktibbeha County. The approximate acreage and proportionate extent of each mapping unit are given in table 1.

The soils of each series are first described as a group. Important features common to all the soils of the series are listed, and the position of the soils on the landscape is given. Each series description has a short narrative description of a representative profile and a much more detailed description of the same profile, from which highly technical interpretations can be made. Following the profile is a brief statement of the range of characteristics of the soils in the series, as mapped in this county. Comparisons are made with other soils that either are located nearby or are generally similar to the soils of the series being described.

Each single soil, or mapping unit, in the series is next described. Single soils are the areas delineated on the map and identified by soil symbols. Generally these descriptions tell how the profile of the soil differs from that described as representative of the series. They also tell about the use and suitability of the soil described and briefly about management needs.

For full information about any one mapping unit, it is necessary to read the description of the soil series as well as the description of the mapping unit. General information about the broad patterns of soils in the county is given in the section "General Soil Map." The color names and color symbols given are for moist soil, unless otherwise indicated.

Many terms used in the soil descriptions and other sections are defined in the Glossary at the back of this survey and in the Soil Survey Manual (*9*).

Adaton Series

The Adaton series consists of poorly drained, strongly acid or very strongly acid soils on uplands. These soils formed in loamy material and are high in silt content. They are nearly level to depressional.

In a representative profile, the surface layer is a dark grayish-brown silt loam about 6 inches thick. Below this, to a depth of about 60 inches, is light brownish-gray silty clay loam mottled with shades of brown.

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TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Adaton silt loam	9, 120	3. 1
Boswell fine sandy loam, 2 to 5 percent slopes	2, 196	. 8
Brooksville silty clay, 0 to 2 percent slopes	1, 970	. 7
Brooksville silty clay, 2 to 5 percent slopes	1, 650	. 6
Catalpa silty clay loam	7, 090	2. 4
Falkner silt loam, 0 to 2 percent slopes	9, 020	3. 1
Falkner silt loam, 2 to 5 percent slopes	2, 210	. 8
Freestone fine sandy loam, 0 to 2 percent slopes	1, 930	. 7
Freestone fine sandy loam, 2 to 5 percent slopes	720	. 2
Gullied land-Sumter complex, 5 to 20 percent slopes	5, 280	1. 8
Houston silty clay	820	. 3
Kipling silty clay loam, 0 to 2 percent slopes	7, 226	2. 5
Kipling silty clay loam, 2 to 5 percent slopes, eroded	9, 460	3. 3
Kipling silty clay loam, 5 to 8 percent slopes, eroded	7, 320	2. 5
Kipling and Sumter soils, 17 to 40 percent slopes, severely eroded	7, 576	2. 6
Leeper silty clay loam	18, 762	6. 5
Longview silt loam, 0 to 2 percent slopes	22, 684	7. 8
Longview silt loam, 2 to 5 percent slopes	3, 570	1. 2
Maben fine sandy loam, 5 to 8 percent slopes, eroded	2, 442	. 8
Maben fine sandy loam, 8 to 12 percent slopes, eroded	1, 170	. 4
Maben soils, 8 to 12 percent slopes	1, 626	. 6
Maben and Ruston soils, 12 to 30 percent slopes	7, 800	2. 7
Mantachie loam	6, 120	2. 1
Marietta fine sandy loam	8, 946	3. 0
Mathiston silt loam	27, 616	9. 5
Myatt loam	1, 920	. 7
Ochlockonee loam	5, 350	1. 8
Oktibbeha fine sandy loam, thick solum variant, 5 to 8 percent slopes, eroded	1, 822	. 6
Oktibbeha silty clay loam, 2 to 5 percent slopes, eroded	1, 080	. 4
Oktibbeha silty clay loam, 5 to 8 percent slopes, eroded	1, 350	. 5
Oktibbeha soils, 8 to 17 percent slopes, severely eroded	17, 338	6. 0
Prentiss silt loam, 0 to 2 percent slopes	7, 250	2. 5
Prentiss silt loam, 2 to 5 percent slopes	7, 440	2. 6
Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded	2, 800	1. 0
Providence silt loam, heavy substratum, 5 to 8 percent slopes, eroded	4, 184	1. 4
Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	980	. 3
Ruston fine sandy loam, 2 to 5 percent slopes	600	. 2
Ruston and Maben soils, 12 to 30 percent slopes	4, 120	1. 4
Savannah fine sandy loam, 2 to 5 percent slopes, eroded	6, 480	2. 2
Savannah fine sandy loam, 5 to 8 percent slopes, eroded	6, 400	2. 2
Savannah fine sandy loam, 8 to 12 percent slopes, eroded	1, 864	. 6
Sessum silty clay loam	2, 994	1. 0
Stough fine sandy loam	5, 710	2. 0
Sumter silty clay loam, 5 to 8 percent slopes, eroded	1, 910	. 6
Sumter silty clay loam, 8 to 12 percent slopes, eroded	1, 076	. 4
Sumter and Binnsville soils, 2 to 5 percent slopes, eroded	2, 600	. 9
Sumter and Binnsville soils, 5 to 8 percent slopes, eroded	2, 910	1. 0
Urbo silty clay loam	10, 524	3. 6
Wilcox silt loam, 0 to 2 percent slopes	782	. 3
Wilcox silty clay loam, 2 to 5 percent slopes, eroded	3, 838	1. 3
Wilcox silty clay loam, 5 to 8 percent slopes, eroded	5, 538	1. 9
Wilcox silty clay loam, 8 to 12 percent slopes, eroded	3, 956	1. 4
Wilcox silty clay loam, 12 to 35 percent slopes, eroded	3, 420	1. 2
Total	290, 560	100. 0

Representative profile of Adaton silt loam, in an idle field about 4¾ miles northwest of Starkville city limits, 3 miles west of State Route 389, and 0.6 mile south of gravel road, NE¼SW¼ sec. 14, T. 19 N., R. 13 E.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; few to common, fine, faint, grayish-brown mottles; weak, fine and medium, granular structure; friable; many fine roots; few, fine, brown and black concretions; strongly acid; clear, smooth boundary.

B21tg—6 to 19 inches, light brownish-gray (10YR 6/2) silty clay loam; common to many, fine and medium, distinct mottles of yellowish brown (10YR 5/6) and pale brown (10YR 6/3); moderate, fine and medium, subangular blocky structure; friable, slightly plastic and slightly sticky; few fine roots and brown and black concretions; few faint clay films on ped faces and in pores; very strongly acid; gradual, wavy boundary.

B22tg—19 to 41 inches, light brownish-gray (10YR 6/2) silty clay loam; common, fine and medium, distinct mottles of yellowish brown (10YR 5/6); weak, medium, prismatic structure parting to moderate, fine and medium, subangular blocky; firm, slightly plastic and sticky; few fine roots; few to common, fine, brown and black concretions; thin patchy clay films on ped faces; very strongly acid; gradual, wavy boundary.

B23tg—41 to 60 inches, light brownish-gray (2.5Y 6/2) silty clay loam; few to common, fine and medium, faint and distinct mottles of yellowish brown (10YR 5/6) and pale brown (10YR 6/3); weak, medium, prismatic structure parting to moderate, fine and medium, subangular blocky; firm, plastic and sticky; few fine roots; few, fine, brown and black concretions; few medium slickensides that do not intersect; gray silt coatings on most peds; thin patchy clay films on ped faces; very strongly acid.

The Ap horizon ranges from dark grayish brown to gray or yellowish brown, and in places is mottled in shades of brown. The B2g horizon ranges from light brownish gray to gray or very dark gray and has few to many mottles in shades of brown and yellow. The B2tg horizon is silt loam or silty clay loam that is 18 to 35 percent clay. The upper 20 inches of the B2tg horizon contains less than 15 percent sand that is coarser than very fine. It has few to many brown and black concretions. Reaction ranges from strongly acid to very strongly acid, except in areas that have been limed.

The Adaton soils occur with Falkner, Longview, Myatt, and Sessum soils. The Adaton soils are less well drained than the Falkner soils, which have a clayey layer at a depth of about 8 to 30 inches. They are also less well drained than the Longview soils and do not have a fragipan. They are similar to the Myatt soils in drainage and clay content, but they differ in that Myatt soils have more than 15 percent sand that is coarser than very fine in the upper 20 inches of the B horizon. The Adaton soils are similar to Sessum soils in drainage, but the Sessum soils have more than 35 percent clay in the B horizon and are underlain by alkaline soil material at a depth of about 40 inches.

Adaton silt loam (Ad).—This soil has slopes of 0 to 2 percent.

Included with this soil in mapping were small areas of Falkner, Longview, Myatt, and Sessum soils. Also included were a few small areas of soils that have a loam or silt loam surface layer, and a few areas of soils that have a clayey subsoil at a depth of about 28 inches.

This soil is very strongly acid to strongly acid. Water moves through the soil at a slow rate. The available water capacity is very high, and runoff is slow. In a few areas ponding occurs and surface water needs to be removed. Proper use of crop residue and sod crops should be practiced to maintain tilth and reduce crusting and packing.

Most of this soil is in pasture or hay, and some minor areas are used for oats and soybeans. Because of a high water table and slow runoff, this soil is particularly suited to pasture plants and trees. This soil is suited to adapted hardwoods and pine trees. (Capability unit IIIw-1; woodland suitability group 3w9; wildlife suitability group 5)

Binnsville Series

The Binnsville series consists of well-drained, mildly alkaline to moderately alkaline soils. These soils formed in thin beds of marly clay over chalk.

In a representative profile the surface layer is a very dark grayish-brown silty clay loam about 8 inches thick over chalk.

In Oktibbeha County, Binnsville soils are mapped only in undifferentiated units with Sumter soils.

Representative profile of Binnsville silty clay loam in a pasture located about 0.5 mile south of Osborn, 0.9 mile east of railroad, 60 feet south of State Route No. 25, SE¼NW¼ sec. 15, T. 19 N., R. 15 E.

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) silty clay loam; weak, fine, granular structure; friable, plastic and sticky; common fine roots; common worm casts; few, fine, calcium carbonate concretions; moderately alkaline; abrupt, wavy boundary.

R—8 to 40 inches, light-gray (2.5Y 7/2) chalk; common, fine to coarse, distinct streaks and splotches of yellow (2.5Y 7/6); horizontal platy rock structure that can be dug with spade when moist; less than 10 percent soil between plates and in cracks in the upper 12 inches; moderately alkaline; calcareous.

The Ap horizon is black to very dark grayish brown; it ranges from 4 to 10 inches in thickness and from silty clay loam to silty clay in texture. The R layer is light gray or very pale brown. In some profiles there is an A and C horizon that contains 10 to 40 percent chalk fragments and more than 50 percent soil. The soil over chalk ranges from 7 to 20 inches in thickness. Hardness of the chalk is 1 to 3 on moh's scale and can be dug with some difficulty with a spade when moist. Reaction ranges from mildly alkaline to moderately alkaline.

The Binnsville soils occur with Houston, Kipling, and Sumter soils. The Binnsville soils are 20 inches, or less, thick over firm chalk, and the Houston and Sumter soils are more than 20 inches thick. They have a thinner A horizon than the Houston soils, which also have a light olive-brown clay AC horizon. The Binnsville soils are less acid throughout than the Kipling soils, and also differ in that Kipling soils have a thicker solum and have a dominantly yellowish-brown B horizon.

Boswell Series

The Boswell series consists of moderately well drained soils that have a firm, clayey subsoil. These soils formed in extremely acid to strongly acid clayey material. Slopes range from 2 to 5 percent.

In a representative profile, the surface layer is brown fine sandy loam about 5 inches thick that is underlain by yellowish-red or red silty clay to a depth of 25 inches. Below this, to a depth of more than 65 inches, is silty clay mottled with shades of red, gray, and brown.

Representative profile of Boswell fine sandy loam in a wooded area approximately 4 miles northwest of Sturgis, 450 feet east of Choctaw County line, north bank of unimproved road, SW¼NW¼ sec. 30, T. 18 N., R. 12 E.

Ap—0 to 5 inches, brown (10YR 5/3) fine sandy loam; few, fine, distinct, strong-brown mottles; weak, fine, granular structure; very friable; common fine roots; few, fine, brown and black concretions; strongly acid; clear, smooth boundary.

B21t—5 to 8 inches, yellowish-red (5YR 5/6) silty clay loam; moderate, fine, subangular blocky structure; firm; few to common fine roots; material from the A horizon in seams between peds; few, fine, brown and black concretions; patchy clay films on peds; very strongly acid; gradual, wavy boundary.

B22t—8 to 19 inches, red (2.5YR 4/6) silty clay; strong, fine and medium, subangular and angular blocky structure; firm, very plastic and sticky; few to common fine and medium roots; few fine concretions; few fine roots; few cracks filled with material from the Ap horizon; continuous clay films or pressure faces on peds; very strongly acid; gradual, wavy boundary.

B23t—19 to 25 inches, yellowish-red (5YR 4/6) silty clay; common, fine, distinct, strong-brown mottles and few, fine, prominent, light brownish-gray mottles; strong, fine and medium, subangular blocky structure that parts to fine and very fine, strong, angular blocky structure; firm, very plastic and sticky; few fine roots; few brown and black concretions; continuous thick clay films on ped faces; very strongly acid; clear, wavy boundary.

B24t—25 to 41 inches, mottled yellowish-red (5YR 4/6), strong-brown (7.5Y 5/6), and light brownish-gray (2.5Y 6/2) silty clay; moderate to strong, fine and medium, subangular blocky structure that parts to strong, fine and very fine, angular blocky structure; firm, very plastic and sticky; few fine roots; few brown and black concretions; few horizontal streaks of reddish yellow up to 1 inch in thickness; continuous clay films or pressure faces on peds; few slickensides that do not intersect; very strongly acid; clear, wavy boundary.

B25t—41 to 55 inches, light-gray (2.5Y 7/2) silty clay; common to many, fine and medium, prominent, yellowish-red (5YR 4/6) mottles and few, fine, distinct, reddish-yellow mottles; moderate, fine, subangular and angular blocky structure; firm, very plastic and sticky; few fine roots; few, fine, brown and black concretions; continuous clay films or pressure faces on peds; very strongly acid; gradual, wavy boundary.

B26t—55 to 65 inches, mottled light-gray (2.5Y 7/2), red (2.5YR 4/6), and reddish-yellow (7.5YR 6/8) silty clay; moderate, fine, subangular and angular blocky structure; firm, very plastic and sticky; few fine roots; few brown and black concretions; patchy clay films or pressure faces on peds; very strongly acid.

The Ap horizon is brown or dark grayish brown and ranges from loam to fine sandy loam. The B21t and B22t horizons are yellowish red or red. The B23t, B24t, and B25t horizons have dominant colors similar to those of the upper part of the B horizon, but they have mottles in shades of gray or brown, or in shades of red, gray, and brown. The upper part of the B horizon has gray or grayish-brown mottles at a depth below 10 inches and ranging downward to a depth of 19 to 29 inches. The B horizon is silty clay loam, clay loam, silty clay, or clay that is more than 35 percent clay in the upper 20 inches. In some horizons brown and black concretions range from few to common, and in others they are lacking. Reaction ranges from extremely acid to strongly acid.

The Boswell soils occur with Ruston, Maben, Wilcox, Kipling, Savannah, and Oktibbeha soils. The Boswell soils are less well drained and finer textured than Ruston soils. They are similar to Maben soils in the upper part of the B horizon, but they are finer textured in the lower part of the B horizon and are less well drained. The Boswell soils are better drained than the Wilcox and Kipling soils, and they are free of gray mottles in the upper part of the B horizon. They are finer textured than the Savannah soils and do not have a fragipan. They are similar to Oktibbeha soils in color, but different in that Oktibbeha soils are underlain by marly clays or chalk at depths of 24 to 54 inches.

Boswell fine sandy loam, 2 to 5 percent slopes (BoB).—This soil is on ridgetops. In some places the surface layer has been rilled and thinned by erosion and is a mixture of the original surface layer and material from the subsoil. In a few small areas the subsoil is exposed.

Included with this soil in mapping were small areas of Maben and Oktibbeha soils and of some well-drained soils that are clayey throughout the subsoil. Also included were a few small areas that have a silt loam or loam surface layer.

This soil is strongly acid to extremely acid. Permeability is very slow, and the available water capacity is high. This soil tends to shrink and crack during dry periods. Runoff is slow to medium, and where this soil is cultivated, the erosion hazard is slight to moderate. This soil is easy to till, except in areas where the subsoil is exposed. Crop residue and soil-improving crops should be properly used to control erosion and reduce crusting and packing.

About half of this soil is in pasture or hay, and some minor areas are in cultivation. The rest is in mixed hardwoods and pine trees. This soil is suited to cotton, corn, soybeans, grain sorghum, small grain, pasture plants, and pine trees. (Capability unit IIIe–1; woodland suitability group 3c2; wildlife suitability group 6)

Brooksville Series

The Brooksville series consists of somewhat poorly drained, clayey soils, in broad areas in the prairie section of the county. Slopes range from 0 to 5 percent. These soils have formed in medium acid to moderately alkaline material over marly clays.

In a representative profile, the surface layer is very dark grayish-brown silty clay about 6 inches thick. This overlies a very dark brown and very dark grayish-brown silty clay that has brownish mottles and is about 19 inches thick. Below this is clay that is mottled in shades of red, brown, and gray and reaches to a depth of 37 inches. Below this to a depth of more than 52 inches is olive clay mottled with shades of brown.

Representative profile of Brooksville silty clay used for hay, about 8 miles northeast of Starkville, and 40 feet south of State Route No. 25, NE¼SE¼ sec. 11, T. 19 N., R. 15 E.

Ap—0 to 6 inches, very dark grayish-brown (2.5Y 3/2) silty clay; moderate, fine, granular and subangular blocky structure; friable to firm, plastic and sticky; common fine roots; few, fine, brown and black concretions; slightly acid; clear, smooth boundary.

A1—6 to 18 inches, very dark brown (10YR 2/2) silty clay; common, fine, faint, dark grayish-brown mottles; moderate, medium, prismatic structure parting into moderate, fine and medium, subangular blocky structure; firm, very plastic, very sticky; few to common fine roots; few, fine, brown and black concretions; slightly acid; gradual, wavy boundary.

AC1—18 to 25 inches, very dark grayish-brown (10YR 3/2) silty clay with common, fine and medium, distinct, dark-brown (10YR 4/3) and reddish-brown (5YR 4/4) mottles; moderate, medium, prismatic structures parting into moderate, fine and medium, angular blocky and subangular blocky structure; firm, very plastic, very sticky; few fine roots; few to common, fine, brown and black concretions; slightly acid; gradual, wavy boundary.

AC2—25 to 37 inches, mottled dark grayish-brown (2.5Y 4/2), yellowish-red (5YR 4/6), and dark-gray (10YR 4/1) clay; common, coarse, intersecting slickensides and parallelepipeds that have long axes tilted about 30 degrees from horizontal; moderate, fine and medium, angular blocky structure; firm, very plastic, very sticky; few fine roots; few, fine, brown and black concretions; few to common, fine to coarse, lime concretions; moderately alkaline.

C—37 to 52 inches, olive (5Y 4/3) clay; common, fine and medium, distinct, light olive-brown (2.5Y 5/4) mottles; many coarse slickensides that intersect and parallelepipeds that have long axes tilted about 40 degrees from horizontal; moderate, fine and medium, angular blocky structure; firm, very plastic, very sticky; few to common, fine, brown and black concretions; few to common, fine to coarse lime concretions; moderately alkaline.

The Ap and A1 horizons range from a very dark grayish brown to a very dark brown. Few to many distinct or prominent mottles in shades of red and brown occur within 20 inches of the surface. The A horizon ranges from 12 to 18 inches in thickness. The AC1 horizon ranges from dark grayish brown to very dark brown and has few to common, distinct or prominent mottles in shades of red and brown. The AC2 horizon is variable, but is dominantly mottled in shades of brown, red, gray, and olive. The AC horizon is dominantly silty clay or clay in texture; it is 35 to about 55 percent clay and less than 8 percent sand. Reaction of the AC horizon ranges from medium acid in the upper part to moderately alkaline in the lower part. Brown and black concretions range from few to many and are frequently more numerous in the lower horizon.

The Brooksville soils occur with Houston, Sumter, and Kipling soils. The Brooksville soils are more acid than the Houston soils and have distinct or prominent mottles in shades of red and brown in the upper 20 inches. The Brooksville soils differ from the Sumter soils in that the Sumter soils are pale olive and have more than 40 percent carbonates in the upper 40 inches. They are less acid throughout than are the Kipling soils, which are dominantly yellowish brown.

Brooksville silty clay, 0 to 2 percent slopes (BrA).—This soil occurs mostly on broad flat areas in the prairie section.

Included in mapping were small areas of Kipling, Houston, and Binnsville soils.

This soil is medium acid to slightly acid in the surface layer and becomes slightly acid to moderately alkaline as depth increases. Permeability is very slow, and the available water capacity is high. The soil shrinks and cracks during dry periods. Runoff is slow, and if this soil is cultivated, the erosion hazard is slight to none. Planting is sometimes delayed in spring by wetness.

About half of this soil is in cultivation, and the rest is in pasture or hay. This soil is suited to cotton, corn, soybeans, grain sorghum, and pasture plants. It is also suited to Eastern redcedar. (Capability unit IIw–1; woodland suitability group 4c2c; wildlife suitability group 4)

Brooksville silty clay, 2 to 5 percent slopes (BrB).—This soil is gently sloping.

The surface layer is very dark grayish-brown silty clay about 6 inches thick. Below this is about 8 inches of very dark grayish-brown silty clay mottled in shades of red and brown. It is underlain by a thick clayey layer mottled in shades of brown, red, and gray.

Included with this soil in mapping were small areas of Kipling, Houston, Sumter, and Binnsville soils. In a few areas, the surface layer has been rilled and thinned by erosion. Also included in mapping were a few small areas of chalk outcrop.

This soil is medium acid in the surface layer and becomes slightly acid to moderately alkaline as depth increases. Permeability is very slow. The available water capacity is high. The soil shrinks and cracks during dry periods. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight to moderate. Crop residue and soil-improving crops should be properly used to reduce erosion and maintain soil tilth.

About half of this soil is in cultivation, and the rest is in pasture or hay. This soil is well suited to cotton, corn, soybeans, grain sorghum, and pasture plants. (Capability unit IIIe–3; woodland suitability group 4c2c; wildlife suitability group 4)

Catalpa Series

The Catalpa series consists of moderately well drained to somewhat poorly drained, slightly acid to moderately alkaline soils that have a thick, dark surface layer. These soils formed in clayey alluvium.

In a representative profile, the surface layer is very dark grayish-brown silty clay loam about 9 inches thick. This is underlain by a dark grayish-brown or very dark grayish-brown silty clay or clay loam that extends to a depth of about 26 inches. Below this, to a depth of about 52 inches, is a clay or silty clay mottled with shades of brown and gray.

Representative profile of Catalpa silty clay loam in a pasture, about three-fourths mile north of Hickory Grove community and U.S. Highway No. 82, 200 feet south of stream channel and 60 feet west of gravel road, SE¼NE¼ sec. 27, T. 19 N., R. 15 E.

Ap—0 to 9 inches, very dark grayish-brown (10YR 3/2) silty clay loam; moderate, fine and medium, granular and subangular blocky structure; firm; many fine roots; few, fine, brown and black concretions; slightly acid; clear, smooth boundary.

A1—9 to 20 inches, very dark grayish-brown (10YR 3/2) silty clay; some spots and coatings of Ap material; moderate, fine and medium, subangular blocky and granular structure; firm, plastic and sticky; few fine roots; few, fine, brown and black concretions; neutral; clear, wavy boundary.

B21—20 to 26 inches, dark grayish-brown (10YR 4/2) clay loam; common, fine, faint, olive-brown mottles; moderate, fine and medium, subangular blocky and granular structure; firm, very plastic and sticky; few shiny pressure faces on peds; few fine roots and brown and black concretions; neutral; gradual, wavy boundary.

B22—26 to 35 inches, mottled dark grayish-brown (10YR 4/2), dark yellowish-brown (10YR 4/4), and gray (10YR 5/1) clay; weak, coarse, prismatic structure parting into moderate, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; shiny pressure faces on some peds; few fine roots; few to common, fine, brown and black concretions; neutral; gradual, wavy boundary.

B3—35 to 52 inches, mottled dark yellowish-brown (10YR 4/4), gray (10YR 5/1), and yellowish-brown (10YR 5/6) silty clay; weak, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; shiny pressure faces on peds; few to common, fine, brown and black concretions; few fine lime nodules; mildly alkaline.

The Ap and A1 horizons are very dark grayish brown or dark brown. The A horizon ranges from 10 to 24 inches in thickness. The B horizon is dark grayish brown, dark brown, or grayish brown with few to many mottles in shades of gray or is mottled in shades of brown and gray. The B horizon ranges from clay loam through clay. At a depth of 10 to 40 inches beneath the surface, it contains 35 to 60 percent clay and is less than 15 percent coarser than very fine sand. Reaction ranges from slightly acid to moderately alkaline. In the A horizon, brown and black concretions range from few to none, and in the B horizon they are few to common.

The Catalpa soils occur with Leeper and Marietta soils. Catalpa soils are similar to the Leeper soils, but differ in that the Leeper soils have a dark horizon less than 10 inches thick. The Catalpa soils are less brown than the Marietta soils, and have a finer texture below the A horizon.

Catalpa silty clay loam (Cp).—This soil is somewhat poorly drained to moderately well drained and is subject to flooding. It occurs on flood plains and has slopes of 0 to 2 percent.

Included with this soil in mapping were small areas of Marietta and Leeper soils, and a few areas of soils that have a very dark grayish-brown layer extending more than 24 inches beneath the surface. Also included were a few areas near stream channels and up narrow flood plains near the hills that have up to 15 inches of fine sandy loam and loam overwash.

This soil is slightly acid to moderately alkaline in reaction. Permeability is slow. The available water capacits is high. This soil tends to shrink and crack during dry periods. Runoff is slow, and ponding occurs in some of the lower areas. This soil has poor tilth and can be easily cultivated only under a limited range of moisture content. The soil tilth can be maintaind by effectively using the crop residue.

Most of this soil is in cultivation, in pasture, or in hay. A few areas are still in hardwoods. This soil is suited to cotton, corn, soybeans, small grains, pasture plants, and adapted hardwoods. (Capability unit IIw–2; woodland suitability group 1w5; wildlife suitability group 1)

Falkner Series

The Falkner series consists of somewhat poorly drained, strongly acid to very strongly acid soils on uplands. These soils formed in a layer of silty material over clayey material. Slopes range from 0 to 5 percent.

In a representative profile the surface layer is dark-brown silt loam about 6 inches thick. This is underlain to a depth of about 27 inches by a yellowish-brown silty clay loam that is mottled in the lower part with brown, red, and gray. Below this is silty clay or clay mottled with red, brown, and gray to a depth of about 64 inches, and next lower in the profile is shale in horizontal plates.

Representative profile of Falkner silt loam in an idle field, about 3½ miles southwest of Starkville, one-half mile southeast of State Route No. 12, on south bank of urban road, SE¼NW¼ sec. 18, T. 18 N., R. 14 E.

Ap—0 to 6 inches, dark-brown (10YR 4/3) silt loam; few, fine, faint, brown mottles; weak, fine, granular structure; friable; common fine roots; few to common, fine, brown and black concretions; strongly acid; clear, smooth boundary.

B21t—6 to 18 inches, yellowish-brown (10YR 5/4) silty clay loam; common, fine and medium, distinct, pale-brown (10YR 6/3) and light brownish-gray (10YR 6/2) mottles; moderate, fine and medium, subangular blocky structure; friable, slightly plastic and sticky; few fine roots; few to common, fine, brown and black concretions; few worm and root holes filled with material from the Ap horizon; patchy clay films on ped faces; strongly acid; gradual, wavy boundary.

B22t—18 to 27 inches, mottled light brownish-gray (2.5Y 6/2), red (2.5YR 4/6), and yellowish-brown (10YR 5/4) silty clay loam; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine roots; patchy clay films on ped faces; thin gray coats on some peds; strongly acid; gradual, wavy boundary.

IIB23t—27 to 49 inches, mottled gray (10YR 6/1), red (2.5YR 4/6), and dark-brown (7.5YR 4/4) silty clay or clay; weak to moderate, fine and medium, subangular and angular blocky structure; very plastic and sticky; few slickensides that do not intersect; few fine roots; few, fine, brown and black concretions; patchy clay films on ped faces; thin gray silt coats on some peds; strongly acid; gradual, wavy boundary.

IIB3—49 to 64 inches, mottled yellowish-brown (10YR 5/4) or gray (10YR 6/1) clay; few, fine, prominent, red mottles; weak subangular blocky structure; firm, very plastic, very sticky; few fine roots; common, fine to coarse, soft to firm, black concretions; few to common slickensides that do not intersect; very strongly acid; gradual, wavy boundary.

R—64 to 70 inches, weathered, very strongly acid shale in horizontal plates.

The A horizon is dark brown, dark grayish brown, or grayish brown. In a few undisturbed wooded areas there is an A1 horizon 1 to 3 inches in thickness that ranges from dark gray to very dark gray. The B21t horizon is yellowish brown to dark yellowish brown or brown, has few to common grayish mottles in the upper 10 inches, and has a texture of silt loam or silty clay loam. The B22t, IIB23t, and B3 horizons are mottled in shades of gray, red, and brown, or they are dominantly gray and have many mottles in shades of brown and yellow and red. The texture is silty clay loam to clay. The clayey horizon ranges from a depth of 18 to 30 inches. Brown and black concretions range from few to many. Reaction of the soil ranges from very strongly acid to strongly acid, except in areas that have received lime.

The Falkner soils occur with the Wilcox, Longview, and Freestone soils. The Falkner soils are less clayey than the Wilcox soils in the upper 20 inches of the B horizon. The Falkner soils are similar to the Longview soils in drainage, but differ in that the Falkner soils have a clayey layer instead of a fragipan. The Falkner soils differ from the Freestone soils in texture. In the upper 20 inches of the B horizon, the Freestone soils are more than 15 percent sand coarser than very fine sand.

Falkner silt loam, 0 to 2 percent slopes (FaA).—This is a somewhat poorly drained soil on broad upland flats. It has the profile described as representative for the series.

Included with this soil in mapping were small areas of Wilcox, Longview, and Adaton soils. Also included were a few small areas of soils that have a clayey layer below 30 inches. In a few small areas the surface layer is thinned by erosion, and this layer is a mixture of the surface layer and subsoil.

This is a strongly acid to very strongly acid soil. Permeability of the upper part of the subsoil is moderate, but water moves slowly through the clayey layer. The available water capacity is high. The soil tills easily, but tends to crust and pack when left idle. A plowpan forms readily if depth of plowing is not varied.

Approximately 40 percent of this soil has been cleared and is in pasture and hay, and minor areas are in cultivation. The rest is in woodland. Runoff is slow, and wetness often slows seedbed preparation in spring. This soil is suited to cotton, soybeans, grain sorghum, corn, small grain, pasture plants, adapted hardwoods, and pine trees. (Capability unit IIIw-2; woodland suitability group 2w8; wildlife suitability group 5)

Falkner silt loam, 2 to 5 percent slopes (FaB).—This somewhat poorly drained soil is on uplands.

The dark-brown silt loam surface layer is about 5 inches thick. The upper part of the subsoil, about 13 inches thick, is yellowish-brown silt loam or silty clay loam that has gray mottles or mottles in shades of yellow, gray, and brown. It is underlain by a thick, mottled, clayey lower part of the subsoil.

Included with this soil in mapping were small areas of Wilcox and Longview soils and of Providence soils having a heavy substratum. In a few areas the surface layer has a few rills and has been thinned by erosion.

This soil is strongly acid or very strongly acid. Permeability of the upper part of the subsoil is moderate, but water moves slowly through the clayey layer. The available water capacity is high. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight. Seedbed preparation is sometimes delayed in spring by wetness. Proper use of crop residue should be practiced to help maintain soil tilth and help prevent crusting and packing. A plowpan forms readily if depth of plowing is not varied.

Approximately three-fourths of this soil is in pasture or hay, and some is in cultivation. The rest is wooded. This soil is suited to cotton, corn, small grains, soybeans, grain sorghum, pasture, adapted hardwoods, and pine trees. (Capability unit IIIw-2; woodland suitability group 2w8; wildlife suitability group 5)

Freestone Series

The Freestone series consists of somewhat poorly drained to moderately well drained, strongly acid to very strongly acid soils. These soils formed in mixed clayey and loamy materials. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is dark grayish-brown fine sandy loam, about 5 inches thick. It overlies a yellowish-brown loam that extends to a depth of about 15 inches, and below this is a mottled clay loam that becomes grayer with depth.

Representative profile of Freestone fine sandy loam, in pasture about one-half mile west of Lowndes County line, and one-half mile south of U.S. Highway No. 82, opposite turnoff road to Oktibbeha Airport, 250 feet southeast of NW. corner, NW¼SE¼ sec. 36, T. 19 N., R. 15 E.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) fine sandy loam; few, fine, distinct, dark-brown mottles; weak, fine, granular structure; friable; common fine roots; medium acid; clear, smooth boundary.

B21t—5 to 15 inches, yellowish-brown (10YR 5/6) loam; few to common, fine, distinct, light-gray and yellowish-red mottles; weak to moderate, medium to fine, subangular blocky structure; friable; common worm channels filled with dark grayish-brown materials from above; common fine roots; patchy clay films on peds; strongly acid; clear, wavy boundary.

B22t—15 to 22 inches, mottled yellowish-brown (10YR 5/6), gray (10YR 6/1), and red (2.5YR 4/6) clay loam; moderate, medium, subangular and angular blocky structure; firm, slightly sticky, slightly plastic; patchy clay films on ped faces; few fine roots; strongly acid; clear, smooth boundary.

B23tg—22 to 40 inches, gray (10YR 6/1) clay loam; common to many, medium, prominent, yellowish-brown (10YR 5/6) and red (2.5YR 4/8) mottles; moderate, medium, subangular and angular blocky structure; firm, sticky and plastic; patchy clay films on ped faces; few fine roots; strongly acid; gradual, smooth boundary.

B3tg—40 to 60 inches, mottled gray (10YR 6/1) and yellowish-brown (10YR 5/8) clay loam; weak, medium, subangular and angular blocky structure; firm, sticky and plastic; patchy clay films on peds; bridging and coating of sand grains; strongly acid.

The Ap horizon is dark grayish brown, brown, or dark brown and it is a fine sandy loam or loam. In a few undisturbed wooded areas there is a A1 horizon 1 to 3 inches thick that ranges from dark gray to very dark gray. The B21t horizon is dominantly yellowish brown with few to common mottles in shades of gray, brown, and red. In some profiles the yellowish-red or red mottles are lacking in the B21t horizon, which is dominantly loam but ranges to sandy loam. The B22t and B23tg horizons are mottled in shades of yellow, brown, gray, and red, or below a depth of 20 inches have gray dominant colors and few to many mottles in shades of red and yellow. The B22t horizon is dominantly clay loam, but ranges to sandy clay loam. Clay content of this horizon ranges from 27 to 35 percent. The B3tg horizon is mottled in shades of gray, yellow, and brown, and textures are similar to those in the B22t and B23tg horizons. Brown and black concretions are few to common. Reaction of these soils ranges from strongly acid to very strongly acid, except where the surface has been limed.

The Freestone soils occur with the Kipling, Stough, Prentiss, and Falkner soils. The Freestone soils are less clayey than the Kipling soils in the upper 20 inches of the B horizon. The Freestone soils are finer textured than the Stough and Prentiss soils and do not have a fragipan. The Freestone soils are less well drained than the Prentiss soils. They differ from the Falkner soils in that the Falkner soils have less than 15 percent sand coarser than fine sand in the upper 20 inches of the B horizon.

Freestone fine sandy loam, 0 to 2 percent slopes (FrA).—This is a nearly level soil on wide flats. It has the profile described as representative for the series.

Included with this soil in mapping were small areas of Kipling, Stough, and Prentiss soils. In a few areas the surface layer is thinned by erosion, and when plowed this layer is a mixture of the surface layer and subsoil. Also included were a few areas that have a loam surface layer.

This soil is strongly acid to very strongly acid. Permeability is moderately slow in the upper part of the subsoil and slow through the lower part of the subsoil. The available water capacity is medium. Runoff is slow, and if this soil is cultivated, the erosion hazard is slight. Soil tilth can be maintained and crusting and packing reduced by proper management of crop residue.

Most of this soil is in pasture or in hay. The rest is in woodland. This soil is suited to cotton, corn, soybeans, small grain, pasture plants, and pine trees. (Capability unit IIw–3; woodland suitability group 2w8; wildlife suitability group 5)

Freestone fine sandy loam, 2 to 5 percent slopes (FrB).—This gently sloping soil occurs on side slopes.

The surface layer is dark grayish-brown fine sandy loam about 5 inches thick. The upper part of the subsoil, about 10 inches thick, is yellowish-brown loam with gray mottles. It is underlain at a depth of 15 to 28 inches by clay loam mottled in shades of yellow, gray, red, and brown.

Included with this soil in mapping were small areas of Kipling, Stough, and Prentiss soils. In a few areas the surface layer has been thinned by erosion, and where these are plowed, the surface layer is a mixture of the original surface soil and material from the subsoil. Also included were a few areas that have a loam surface layer.

This soil is strongly acid to very strongly acid. Permeability is moderately slow in the upper part of the subsoil and slow through the lower part of the subsoil. The available water capacity is medium. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight to moderate. Soil tilth can be maintained and the erosion hazard can be reduced by proper management of crop residue.

Most of this soil is in pasture or in hay. The rest is in woodland. This soil is suited to soybeans, grain sorghum, cotton, corn, pasture, and pine trees. (Capability unit IIIe–1; woodland suitability group 2w8; wildlife suitability group 5)

Gullied Land

Gullied land is so eroded that only narrow, isolated areas of the original soils remain between the gullies. The original soils were mostly of the Sumter series. The gullies range from about a quarter of an acre to several acres in size. In some areas all the soil material has been removed and chalk outcrop is exposed.

Gullied land-Sumter complex, 5 to 20 percent slopes (GsE).—This complex occupies areas that are strongly sloping to moderately steep. Deep gullies in an intricate pattern make up about 30 to 60 percent of most areas. The Sumter soils, which make up 20 to 40 percent, occur as isolated spots, and narrow fingerlike extensions of the original soil remain between the gullies (fig. 2). Binnsville and Kipling soils are two of the minor soils of the complex.

The Sumter soils of this mapping unit are mildly alkaline to moderately alkaline. Permeability of the subsoil is slow, and the available water capacity is medium to low. Runoff is rapid to very rapid, and the erosion hazard is severe.

Most of this complex is in woods or is idle. Because of the severe erosion hazard, this should be kept in permanent vegetation. Pasture plants or cedar trees are suited to the alkaline areas, and pasture plants and pine trees are suited to the acid areas. (Capability unit VIIe–1; wildlife suitability group 3; not in a woodland suitability group)

Figure 2.—**Gully and sheet erosion on Gullied land-Sumter complex, 5 to 20 percent slopes. Topsoil has eroded, and Selma chalk is exposed.**

Houston Series

The Houston series consists of moderately well drained, neutral to moderately alkaline soils of the prairie uplands. These soils formed in alkaline clays.

In a representative profile, the surface layer is very dark grayish-brown silty clay about 9 inches thick. This layer is underlain by a very dark brown or very dark grayish-brown silty clay or clay that continues to a depth of 24 inches. Below this, to a depth of 64 inches or more, is light olive-brown clay that is mottled with shades of yellow and pale brown.

Representative profile of Houston silty clay in a cultivated area about 300 yards east and 75 feet south of northwest corner of NW¼SW¼ sec. 32, T. 20 N., R. 15 E.

Ap—0 to 9 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, fine and medium, granular and subangular blocky structure; firm, plastic and sticky; common fine roots; common fine lime concretions; few, fine, brown concretions; moderately alkaline; clear, smooth boundary.

A11—9 to 20 inches, very dark brown (10YR 2/2) silty clay; moderate, medium, prismatic structure parting to strong, fine and medium, subangular blocky and granular structure; firm, very plastic, very sticky; few fine roots and brown and black concretions; few cracks filled with material from Ap horizon; few shiny pressure faces on peds; moderately alkaline; gradual, wavy boundary.

A12—20 to 24 inches, very dark grayish-brown (2.5Y 3/2) clay with many, fine and medium, faint, dark grayish-brown (2.5Y 4/2) and olive-brown (2.5Y 4/4) mottles; moderate, medium, prismatic structure parting to moderate, fine and medium, subangular blocky and angular blocky structure; firm, very plastic, very sticky; few fine roots; few fine lime concretions; few cracks filled with material from Ap horizon; few pressure faces on peds; moderately alkaline; noncalcareous in matrix; clear, wavy boundary.

AC—24 to 45 inches, light olive-brown (2.5Y 5/4) clay with common, fine, distinct, brownish-yellow mottles and few, fine streaks and mottles of dark grayish brown; common slickensides that intersect; some parallelepipeds with long axes tilted about 30 degrees from horizontal; firm, very plastic, very sticky; few fine roots; common fine to coarse lime concretions; common pressure faces on peds; moderately alkaline; gradual, wavy boundary.

C—45 to 64 inches, mottled brownish-yellow (10YR 6/8), yellow (10YR 7/8), and very pale brown (10YR 7/3) clay; massive; some parallelepipeds with long axes tilted about 40 degrees from horizontal; firm, very plastic, very sticky; few to common, fine to coarse lime concretions; calcareous.

The Ap and A1 horizons are very dark grayish brown to very dark brown. The A horizon ranges from 20 to 28 inches in thickness and from 40 to 50 percent in clay content. The AC and C horizons are light olive brown or light yellowish brown and have few to many mottles of brown, olive, or yellow. The AC and C horizons are dominantly silty clay or clay; they range from 40 to 58 percent in clay content. Reaction ranges from neutral to moderately alkaline. In some horizons, few to many, fine to coarse, firm lime concretions are present. In the lower horizons these concretions are more numerous and coarser near the calcareous chalk or marl.

These soils are less clayey than is defined in the range for the Houston series, but this does not alter their usefulness and behavior.

The Houston soils occur with the Brooksville, Kipling, Sumter, and Binnsville soils. The Houston soils are less acid in the A horizon than the Brooksville soils, which have distinct or prominent mottles in shades of red and brown within 20 inches of the surface. The Houston soils are less acid throughout the solum than the Kipling soils, which have dominantly yellowish-brown B horizons. The Houston soils differ from the Sumter soils in that the Sumter soils have dominantly pale-olive horizons and have more than 40 percent calcium carbonates in the upper 40 inches of the profile. The Houston soils differ from the Binnsville soils in that the Binnsville soils have a dark A horizon and firm chalk within 20 inches of the surface.

Houston silty clay (Ho).—This soil is moderately well drained and is on uplands. Slopes range from 0 to 2 percent. The profile is that described as representative for the series.

Included with this soil in mapping were small areas of Brooksville, Kipling, Sumter, and Binnsville soils. Also included were a few areas of soils having slopes up to 4 percent.

This soil is neutral to moderately alkaline. Permeability is very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. Runoff is slow, and if the soil is cultivated, the erosion hazard is slight. Proper use of crop residue should be practiced to aid infiltration and soil tilth. Tilth can also be improved by fall preparation of seedbeds, provided erosion is not a hazard in the areas selected.

Most of this soil is in cultivation or in hay. This soil is suited to cotton, corn, soybeans, small grain, and pasture plants. (Capability unit IIs-1; woodland suitability group 4c2c; wildlife suitability group 4)

Kipling Series

The Kipling series consists of somewhat poorly drained soils. These soils formed in strongly acid to very strongly acid clays over mildly alkaline calcareous formations. They occur on broad upland ridges.

In a representative profile, the surface layer is brown silty clay loam, about 5 inches thick, that is underlain to a depth of about 9 inches by yellowish-brown silty clay loam. Below this, to a depth of about 54 inches, is a silty clay mottled by shades of red, brown, and gray; and this is underlain by firm chalk.

Representative profile of Kipling silty clay loam in a pasture located about 0.8 mile north of U.S. Highway No. 82, at drive-in theatre, and 30 feet west of blacktop road, NE¼NE¼ sec. 29, T. 19 N., R. 15 E.

Ap—0 to 5 inches, brown (10YR 5/3) silty clay loam; common, fine, faint, pale-brown and yellowish-brown mottles; massive to weak, fine, granular structure; friable; common fine roots and brown and black concretions; strongly acid; clear, smooth boundary.

B21t—5 to 9 inches, yellowish-brown (10YR 5/6) silty clay loam; few to common, fine and medium, distinct, strong-brown (7.5YR 5/6) and yellowish-red (5YR 4/8) mottles; moderate, fine and medium, subangular blocky structure; friable, slightly plastic and sticky; few fine roots and brown and black concretions; patchy clay films on ped faces; strongly acid; gradual, smooth boundary.

B22t—9 to 15 inches, mottled yellowish-brown (10YR 5/6), yellowish-red (5YR 4/8), and light brownish-gray (2.5Y 6/2) silty clay; moderate, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; few fine roots and brown and black concretions; patchy clay films or pressure faces; strongly acid; gradual, wavy boundary.

B23t—15 to 28 inches, mottled yellowish-brown (10YR 5/6), light brownish-gray (2.5Y 6/2), and yellowish-red (5YR 4/8) silty clay; moderate, medium, prismatic structure parting to moderate, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; few fine roots and brown and black concretions; continuous films or pressure faces; few slickensides that do not intersect; strongly acid; gradual, wavy boundary.

B3t—28 to 42 inches, mottled yellowish-brown (10YR 5/6) and light brownish-gray (2.5YR 6/2) silty clay; few, fine, prominent, yellowish-red mottles; moderate, fine and medium, subangular blocky and angular blocky structure; firm, very plastic, very sticky; few fine roots; few to common, fine, brown and black concretions; few slickensides that do not intersect; clay films or pressure faces on peds; strongly acid; gradual, wavy boundary.

C—42 to 54 inches, light olive-brown (2.5Y 5/4) silty clay; common, fine and medium, distinct, dark grayish-brown (10YR 4/2) mottles; common slickensides that intersect; parts into blocky and wedge-shaped parallelepipeds; firm, very plastic, very sticky; few fine roots; few to common, fine, brown and black concretions; few lime nodules and concretions; neutral; abrupt, wavy boundary.

R—54 to 60 inches; firm Selma chalk.

The Ap horizon is brown, dark grayish brown or dark brown. In some undisturbed wooded areas there is an A1 horizon 1 to 3 inches thick that ranges from dark gray to very dark gray. The Ap is dominantly silty clay loam, but ranges from silty clay loam to loam. The upper part of the B2 horizon is dominantly yellowish brown or strong brown with few to many mottles in shades of gray and red or is mottled in shades of yellow, brown, gray, and red. The upper 10 inches of the B2 horizon has few to many mottles of light brownish gray, grayish brown, or gray. The B2 horizon is silty clay loam, clay loam, silty clay or clay with the clay content ranging from 35 to 58 percent. The B3t horizon is similar to the B23t horizon in color pattern, and the texture is silty clay or clay. Few to many slickensides are present in the B3t and C horizons, but do not intersect at depths of less than 40 inches. They are more numerous with depth. The calcareous material ranges from depths of 36 to 80 inches, and, in some areas, the change in depth is quite abrupt and irregular. Reaction ranges from strongly acid to very strongly acid in the upper horizons to mildly alkaline near chalk.

The Kipling soils occur with Oktibbeha, Boswell, Brooksville, Houston, and Freestone soils. The Kipling soils are less red in the B horizon than the Oktibbeha and Boswell soils and have gray mottles in the upper 10 inches of the B horizon that do not occur in the Oktibbeha and Boswell soils. The Kipling soils differ from the Brooksville and Houston soils in that the Brooksville and Houston soils have a thick, dark-colored A horizon that has intersecting slickensides. The Kipling soils are finer textured than the Freestone soils.

Kipling silty clay loam, 0 to 2 percent slopes (KIA).—This soil is on broad and narrow flats. It has the profile described as representative for the series.

Included with this soil in mapping were small areas of Brooksville and Oktibbeha soils. In a few small areas the calcareous material is within 2 feet of the surface. Also included were a few areas that have a silt loam or loam surface layer.

This soil is strongly acid to very strongly acid. Permeability is slow to very slow. The available water capacity is high. This soil shrinks and swells and tends to crack during dry periods. Its tilth is poor but can be improved by plowing late in fall and making proper use of crop residue and soil-improving crops. Runoff is slow, and if this soil is cultivated, the erosion hazard is slight.

In the past few years a large part of this soil has been converted from grassland and forage crops and is used for soybeans. A few areas are still in hardwoods and scattered patches of pine trees. This soil is suited to well suited to cotton, corn, soybeans, grain sorghum, small grain, pasture plants, adapted hardwoods, and pine trees. (Capability unit IIw–1; woodland suitability group 2c8; wildlife suitabililty group 4)

Kipling silty clay loam, 2 to 5 percent slopes, eroded (KIB2).—This is a gently sloping soil on ridges and side slopes.

The surface layer is dark grayish-brown to brown silty clay loam about 4 inches thick. In most of the areas this layer has been thinned by erosion. Some fields contain a few small gullies or rills that have exposed the subsoil. The subsoil is mottled yellowish-brown, brown, gray, or red silty clay or clay.

Included with this soil in mapping were small areas of mottled sandy clay loam that has the chalk within 2 to 3 feet of the surface. Also included were small areas of Oktibbeha and Sumter soils. In a few small areas the firm calcareous material is within 2 feet of the surface.

This soil is strongly acid to very strongly acid. Permeability is slow to very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. Tilth is poor but can be improved by plowing late in fall and making proper use of crop residue and soil-improving crops. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight to moderate.

In the past few years a large part of this soil has been converted from grassland and forage crops and is used for soybeans. Some of it is still in pasture or wooded. Cotton, corn, soybeans, grain sorghum, small grains, adapted hardwoods, and pine trees are suitable for this soil. Pasture and pine trees are particularly suitable. (Capability unit IIIe–3; woodland suitability group 2c8; wildlife suitability group 4)

Kipling silty clay loam, 5 to 8 percent slopes, eroded (KIC2).—This soil is on side slopes.

The dark-brown to brown silty clay loam surface layer is about 4 inches thick. In most of the areas this layer has been thinned by erosion, and in some it is a mixture of the original surface layer with subsoil. A few fields have a few small gullies or rills that expose the subsoil. The subsoil is mottled in shades of yellow, red, and gray and is a silty clay or clay.

Included with this soil in mapping were small areas of Oktibbeha and Sumter soils, and a few areas of a mottled sandy clay loam. In a few areas the firm calcareous material is within 2 feet of the surface. Also included were a few small areas that have a loam or sandy clay loam surface layer, and some with slopes up to 12 percent.

This soil is strongly acid to very strongly acid. Permeability is slow to very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. Runoff is medium, and where this soil is cultivated, the erosion hazard is moderate. Tilth is poor but can be improved by plowing late in fall and making proper use of crop residue and soil-improving crops.

Most of this soil is in pasture or in cultivation. The rest is in scrubby woodland. Soybeans, grain sorghum, small grains, pasture plants, and pine trees are suitable. Because of slope and the erosion hazard, this soil is dominantly in pasture and in trees. (Capability unit IVe-2; woodland suitability group 2c8; wildlife suitability group 4)

Kipling and Sumter soils, 17 to 40 percent slopes, severely eroded (KsF3).—These soils are in the eastern part of the county. They formed in acid to calcareous soil materials. They do not occur in a uniform pattern, but one or both of the two major soils are in all areas mapped. The size of areas ranges from 20 to 600 acres.

The Kipling soils and Sumter soils are dominant. Included are lesser amounts of Maben, Ruston, and Oktibbeha soils, and some areas of a moderately well drained soil that has a dark yellowish-brown to yellowish-brown subsoil. Marietta soils are in the narrow alluvial areas.

The erosion is variable, but in most areas the surface layer has been thinned and the subsoil is exposed. In most areas there are a few deep gullies.

The Kipling soils occur on the narrow ridges and on the side slopes. They have a yellowish-brown silty clay upper subsoil that is underlain by mottled clay.

These soils are strongly acid to very strongly acid. Permeability is slow to very slow. The available water capacity is high. During dry periods these soils shrink and crack.

The Sumter soils occur on a few of the narrow ridges and on many of the side slopes. They have a calcareous, olive, clayey subsoil that is underlain by firm, marly clay or by chalk. These soils are mildly alkaline to moderately alkaline. Permeability is slow. The available water capacity is medium.

Most of the acreage of these soils is in cutover woodland, and some is in pasture. Because of slope, rapid runoff, and severe erosion hazard, these soils should be kept in permanent vegetation. They are suited to most commonly grown pasture plants. The acid soils are not suited to sweetclover and black medic, but they are suited to pine trees and adapted hardwood. Cedar trees and Osage-orange are suited to the alkaline soils. (Both soils in capability unit VIIe-2; Kipling part, woodland suitability group 2c8; Sumter part, woodland suitability group 4c2c; both soils in wildlife suitability group 3)

Leeper Series

The Leeper series consists of somewhat poorly drained, medium acid to moderately alkaline soils. These soils formed in clayey alluvium on flood plains.

In a representative profile, the surface layer is very dark grayish-brown silty clay loam, about 5 inches thick, that is underlain to a depth of 9 inches by a very dark gray silty clay. Below this, to a depth of about 42 inches, is a mottled brownish clay or dark-gray silty clay loam mottled with shades of brown. Under this is a mottled dark-gray, yellowish-brown, and strong-brown clay loam.

Representative profile of Leeper silty clay loam in a cultivated area approximately 6 miles east of State College, out Blackjack Road, 150 feet south of Sand Creek Canal and 75 feet east of gravel road, NW¼NE¼ sec. 11, T. 18 N., R. 15 E.

Ap—0 to 5 inches, very dark grayish-brown (2.5Y 3/2) silty clay loam; moderate, fine and medium, granular and subangular blocky structure; friable, plastic and sticky; common fine roots; few, fine, brown and black concretions; moderately alkaline; clear, smooth boundary.

A1—5 to 9 inches, very dark gray (10YR 3/1) silty clay; few, fine, faint, dark yellowish-brown mottles; moderate, fine and medium, subangular blocky and granular structure; friable to firm, plastic and sticky; few fine roots and brown and black concretions; few cracks filled with material from the Ap horizon; mildly alkaline; clear, smooth boundary.

B21—9 to 26 inches, mottled dark grayish-brown (10YR 4/2), dark-brown (7.5YR 4/4), and dark yellowish-brown (10YR 4/4) clay; moderate, fine and medium, subangular and angular blocky structure; firm, very plastic and sticky; few fine roots and brown and black concretions; common pressure faces on peds; some Ap material in root channels and cracks; mildly alkaline; gradual, wavy boundary.

B22g—26 to 42 inches, dark-gray (10YR 4/1) silty clay loam; many, fine and medium, distinct, dark grayish-brown (10YR 4/2), dark yellowish-brown (10YR 4/4), and strong-brown (7.5YR 5/6) mottles; moderate, fine, subangular and angular blocky structure; firm, very plastic and sticky; few fine roots; common, fine, brown and black concretions; few coarse slickensides or pressure faces; mildly alkaline; gradual, wavy boundary.

Cg—42 to 53 inches, mottled dark-gray (10YR 4/1), yellowish-brown (10YR 5/4), and strong-brown (7.5YR 5/6) clay loam; structureless; massive; firm, very plastic and sticky; common to many, fine, brown and black concretions; common pressure faces on peds; mildly alkaline.

The Ap and A1 horizons are very dark grayish brown or very dark gray. Where the soil, when moist, has value of 3.5 or less, the A horizon is less than 10 inches in thickness. The B horizon is dark grayish brown or dark gray in the lower part, or it is mottled in shades of gray, brown, and yellow. The B and C horizons are silty clay, clay, silty clay loam, or clay loam. The clay content ranges from 35 to 60 percent between a depth of 10 and 40 inches. Brown and black concretions range from few to many, and some profiles contain lime concretions in the lower horizons. Reaction ranges from medium acid to moderately alkaline.

The Leeper soils occur with the Catalpa, Marietta, and Urbo soils. The Leeper soils have a less thick dark surface horizon that the Catalpa soils and are not so well drained. The Leeper soils are finer textured than the Marietta soils. They differ from the Urbo soils in that the Urbo soils are strongly acid.

Leeper silty clay loam (Le).—This is a nearly level soil on flood plains. Slopes range from 0 to 2 percent.

Included with this soil in mapping were small areas of Marietta and Catalpa soils. Some areas near stream channels and foothills have up to 10 inches of loamy overwash material. Some more poorly drained soils occur in a few low areas.

This soil ranges from medium acid to moderately alkaline. Its permeability is slow. It shrinks and cracks during dry periods. The available water capacity is high. Runoff is slow, and there is ponding in some low areas. Proper use of crop residue should be practiced in order to maintain soil tilth and to help prevent crusting and packing.

Most of this soil is in cultivation, in pasture, or hay. The rest is in cutover hardwoods. Crops may be damaged by flooding. This soil is well suited to suited to cotton, corn, soybeans, grain sorghum, small grain, pasture plants, and adapted hardwoods. (Capability unit IIw-2; woodland suitability group 1w6; wildlife suitability group 1)

Longview Series

The Longview series consists of somewhat poorly drained, strongly acid to very strongly acid soils that have a fragipan. These soils formed in loamy materials high in silt. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is grayish-brown silt loam about 4 inches thick, that is underlain to a depth of about 18 inches by a yellowish-brown silt loam mottled with shades of gray. Below this, to a depth of about 55 inches, is a firm, compact and brittle silt loam mottled with shades of brown and gray. This silt loam is underlain to a depth of about 72 inches by a light-gray silty clay loam.

Representative profile of Longview silt loam in a wooded area about 4½ miles southwest of Starkville, 366 yards east of State Route No. 25, 35 feet south of field road, and 50 feet southwest of northeast corner of NE¼NW¼ sec. 32, T. 18 N., R. 14 E.

Ap—0 to 4 inches, grayish-brown (10YR 5/2) silt loam; few, fine, distinct, yellowish-brown mottles; weak, fine and medium, granular structure; friable; common fine and medium roots; few, fine, brown concretions; very strongly acid; clear, smooth boundary.

B1—4 to 9 inches, yellowish-brown (10YR 5/4) silt loam; few, fine, distinct, light brownish-gray mottles; weak, medium, subangular blocky structure; friable; few, fine and medium roots; few, fine, black and brown concretions; very strongly acid; clear, smooth boundary.

B21—9 to 18 inches, yellowish-brown (10YR 5/6) silt loam; common, fine and medium, distinct, light-gray (10YR 6/1) mottles; weak, fine and medium, subangular blocky structure; friable; few, fine and medium roots; few, fine, brown and black concretions; very strongly acid; clear, smooth boundary.

Bx1—18 to 26 inches, mottled yellowish-brown (10YR 5/6) and light brownish-gray (2.5Y 6/2) silt loam; weak, medium, prismatic structure parting to weak, fine and medium, subangular blocky structure; firm, compact and brittle, slightly plastic; few, fine and medium roots; few, fine, brown and black concretions; few, patchy clay flows in pores; few clean sand grains; gray silt coats on some peds and in cracks and pores; very strongly acid; gradual, smooth boundary.

Bx2—26 to 55 inches, light brownish-gray (2.5Y 6/2) silt loam; common, fine and medium, distinct, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/6) mottles; moderate, medium, prismatic structure parting to weak to moderate, fine and medium, subangular blocky structure; firm, compact and brittle; few fine roots; few, fine, brown and black concretions; few patchy clay films on peds; few clean sand grains; very strongly acid; gradual, wavy boundary.

B22tg—55 to 72 inches, light-gray (10YR 6/1) silty clay loam; few to common, fine and medium, distinct, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, fine and medium, subangular blocky structure; firm, plastic and slightly sticky; few fine roots; few, fine, brown and black concretions; clay films on some peds and in pores; gray silt coats on some prisms; very strongly acid.

The Ap horizon is grayish brown, dark brown, or brown and is dominantly silt loam with some areas of loam. In some undisturbed wooded areas there is an A1 horizon, 1 to 3 inches thick, that is very dark grayish brown or dark grayish brown. The B horizon above the fragipan is dominantly yellowish brown but ranges to brown or pale brown and has few to many grayish mottles in the upper 10 inches. The B horizon is dominantly silt loam having a clay content ranging from 18 to 27 percent and a silt content ranging from 52 to 75 percent. The Bx and B22tg horizons are dominantly shades of gray, have common to many yellow and brown mottles or shades of gray, yellow, and brown, and have a silt loam to silty clay loam texture and a clay content of 18 to 35 percent. The Bx horizon ranges from 15 to 26 inches in depth. Reaction of these soils ranges from strongly acid to very strongly acid except in areas that have received lime.

The Longview soils occur with Falkner, Stough, Prentiss, and Providence soils. The Longview soils differ from the Falkner soils in that the Falkner soils lack a fragipan and have a clayey layer in the lower part of the B horizon. The Longview soils are finer textured and more silty than the Stough and Prentiss soils. They are not so well drained as the Providence soils, which lack gray mottles in the upper part of the B horizon.

Longview silt loam, 0 to 2 percent slopes (LoA).—This is a nearly level soil on broad upland areas.

Included with this soil in mapping were small areas of Falkner, Prentiss, Stough, and Adaton soils and a few areas of a soil that has similar drainage but is less clayey in the subsoil above the fragipan.

This soil is strongly acid to very strongly acid. Permeability of the subsoil is moderate, but moisture moves slowly through the fragipan. The available water capacity is medium. Runoff is slow. The soil works fairly well but crusts and packs when left without a plant cover.

Approximately one-third of this soil has been cleared and is in pasture or in hay crops. A large part of the rest is in scrubby black jack oaks and in other hardwoods; however, some areas have good stands of pine timber (fig. 3). Surface runoff is slow, and wetness often delays seedbed preparation in spring. This soil is fairly well suited to cotton, corn, soybeans, and small grain, and adapted hardwoods; it is well suited to pasture plants and pine trees. (Capability unit IIIw-2; woodland suitability group 2w8; wildlife suitability group 5)

Longview silt loam, 2 to 5 percent slopes (LoB).—This is a somewhat poorly drained soil in upland areas.

The surface layer is about 4 inches of brown to dark-brown silt loam. The upper part of the subsoil, about 9 inches thick, is a yellowish-brown heavy silt loam with gray mottles. It is underlain at a depth of 15 to 26 inches by a thick fragipan mottled in shades of gray, brown, and yellow.

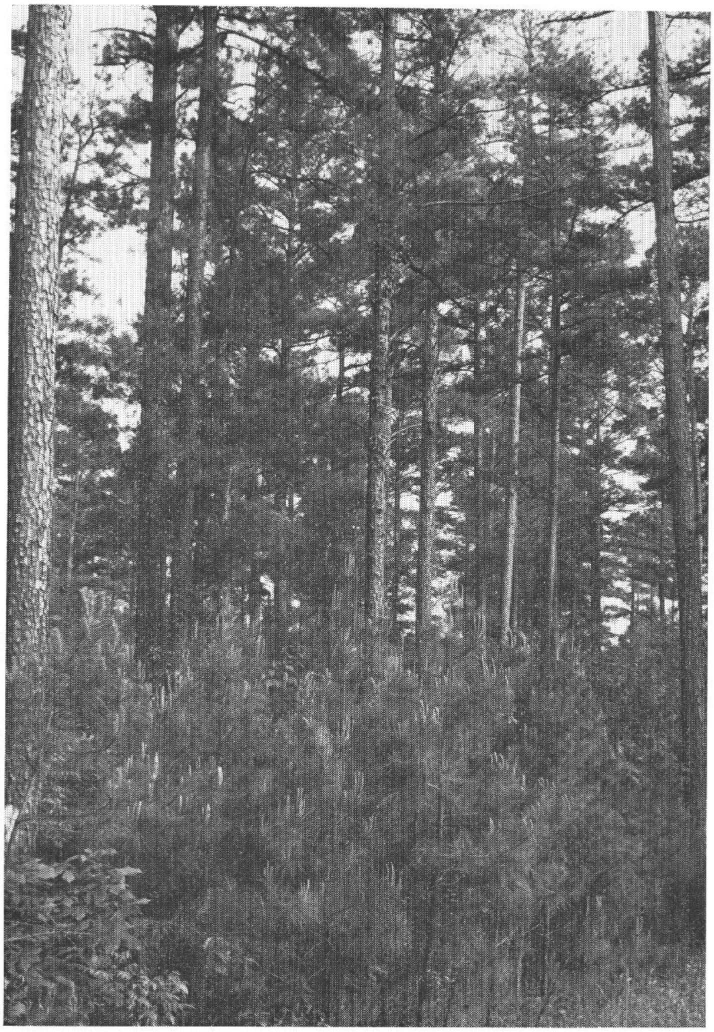

Figure 3.—**Fifty-five year old loblolly pine and a well-stocked understory of seedlings and saplings on Longview silt loam, 0 to 2 percent slopes.**

Included with this soil in mapping were small areas of Falkner, Prentiss, and Stough soils. In a few areas the surface layer has been thinned by erosion. Also included were a few areas that have a loam surface layer.

This soil is strongly acid to very strongly acid. Permeability of the upper part of the subsoil is moderate, but water moves slowly through the fragipan. The available water capacity is medium. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight. Tilth is fair, but proper use of crop residue should be practiced to help prevent crusting and packing.

Most of this soil is in pasture or hay, but some minor areas are in cultivation. This soil is fairly well suited to cotton, corn, soybeans, small grain, and adapted hardwoods. It is well suited to pasture plants and pine trees. (Capability unit IIIw-2; woodland suitability group 2w8; wildlife suitability group 5)

Maben Series

The Maben series consists of well-drained, slightly acid to very strongly acid soils. These soils formed in stratified sands and clays. Slopes range from 5 to 30 percent.

In a representative profile, the surface layer is dark-brown fine sandy loam, about 5 inches thick, that is underlain to a depth of 23 inches by yellowish-red clay or clay loam. Below this, to a depth of about 41 inches, is a red loam that is underlain to a depth of 60 inches or more by a stratified, partly weathered, grayish-brown shale and brownish-yellow fine sandy loam.

Representative profile of Maben fine sandy loam in a wooded area about two-tenths mile east of Choctaw County line, 30 feet north of U.S. Highway No. 82, NW¼NW¼ sec. 7, T. 19 N., R. 12 E.

Ap—0 to 5 inches, dark-brown (10YR 4/3) fine sandy loam; weak, medium, granular structure; friable; many fine and medium roots; few to common, fine to coarse, brown and black concretions; few fine mica flakes; few, fine to coarse sandstone fragments; slightly acid; clear, smooth boundary.

B21t—5 to 16 inches, yellowish-red (5YR 4/6) clay; strong, fine and medium, subangular blocky and strong, fine, angular blocky structure; firm, plastic and sticky; common, fine and medium roots; few, fine and medium, brown and black concretions; few fine mica flakes; continuous clay films on all ped faces; medium acid; clear, wavy boundary.

B22t—16 to 23 inches, yellowish-red (5YR 4/5) clay loam; strong, fine and medium, subangular and angular blocky structure; firm, plastic and sticky; few to common fine roots; few fine mica flakes; continuous clay films on all ped faces; common, fine, distinct, light-gray shale fragments; strongly acid; clear, wavy boundary.

B3t—23 to 41 inches, mottled red (2.5YR 4/6) loam, about 30 percent of which is grayish-brown (2.5Y 5/2) shale fragments; weak, medium, platy and weak, fine to medium, subangular blocky structure; friable; few fine roots; common fine mica flakes; patchy clay films on ped faces; strongly acid; gradual, wavy boundary.

C—41 to 60 inches, stratified fine sandy loam that is about 60 percent grayish-brown (2.5Y 5/2) partly weathered shale, and brownish-yellow (10YR 6/6) fine sandy loam; structureless; firm; common fine mica flakes; strongly acid.

The A1 or Ap horizon is dark brown, brown, or dark grayish brown. The B2t horizon is yellowish red, red, or reddish brown. The lower B2t horizon may have few to common, strong-brown to yellowish-brown mottles. The B2t horizon ranges from clay loam to silty clay or clay. The clay content of the upper 20 inches ranges from 35 to 50 percent. The B3t horizon is similar to the B2t but in places has few to many mottles in shades of yellow and brown and contains few to many grayish-brown shale fragments. The B2t horizon ranges from clay loam to loam. The C horizon is variable in color and texture and is stratified. It contains some sand and clays having a high content of mica. The stratification in the C horizon is more apparent in some profiles than others, and it ranges in shades of gray, brown, yellow, and red. Some profiles contain lenses of gray, dark gray, and pale brown. The C horizon ranges from clay or fine sandy loam to sandy loam, and the solum ranges from 20 to 50 inches in depth. Mica flakes range from few to many. Reaction of these soils ranges from slightly acid to very strongly acid, except in areas that have been limed.

The Maben soils occur with Boswell, Ruston, Wilcox, and Savannah soils. The Maben soils differ from the Boswell soils in that the Boswell soils are clayey throughout the B horizon and swell when wet and shrink when dry. The Maben soils differ from the Ruston soils in that the Ruston soils have a thicker, coarser textured B horizon. They differ from the Wilcox soils in that the Wilcox soils are clayey throughout and have gray mottles in the upper part of the

B horizon. The Maben soils are finer textured than the Savannah soils and do not have a fragipan.

Maben fine sandy loam, 5 to 8 percent slopes, eroded (MbC2).—This soil occurs on ridgetops and side slopes.

The surface layer is brown fine sandy loam about 4 inches thick. In most areas the surface layer has been rilled and thinned by erosion and is a mixture of the original surface layer and material from the subsoil. In some fields there are a few shallow gullies. The upper part of the subsoil, about 20 inches thick, is yellowish-red or red clay or clay loam that is underlain by stratified layers of sands and clays that are rich in mica and shale fragments.

Included with this soil in mapping were small areas of Boswell, Ruston, and Wilcox soils and a few severely eroded areas in which there are many shallow gullies and a few deep gullies. Also included were a few small areas that have a loam or silt loam surface layer.

This soil is slightly acid to very strongly acid. Permeability is moderately slow. The available water capacity is medium. Runoff is medium, and if this soil is cultivated, the erosion hazard is moderate. This soil is easily tilled except in areas where most of the original surface layer is lacking. Proper use of crop residue and the use of soil-improving crops should be practiced to reduce the erosion hazard and to reduce crusting and packing.

Approximately half of this soil is used for pasture or hay. Some has reverted to mixed hardwoods and pine trees. The rest is wooded. This soil is suited to cotton, corn, soybeans, grain sorghum, small grain, pasture plants, and pine trees. (Capability unit IIIe-1; woodland suitability group 3c2; wildlife suitability group 6)

Maben fine sandy loam, 8 to 12 percent slopes, eroded (MbD2).—This is a moderately well drained soil on side slopes.

Included with this soil in mapping were small areas of Boswell and Wilcox soils. Also included were a few small areas that have a loam or sandy clay loam surface layer.

This soil is slightly acid to very strongly acid. Permeability is moderately slow. The available water capacity is medium to high, and runoff is rapid.

Most of this soil has remained as woodland but some is in pasture. Because of slope, rapid runoff, and high erosion hazard, this soil is better suited to pasture and pine trees than to other uses. It is also suited to grain sorghum and small grains. (Capabilty unit IVe-3; woodland suitability group 3c2; wildlife suitability group 6)

Maben soils, 8 to 12 percent slopes (MeD).—The soils in this mapping unit are well drained and occur on strongly sloping side slopes. The Maben soils make up about 75 percent of the mapping unit. The rest is made up of small areas of the Boswell, Providence, and Ruston soils scattered throughout areas of the Maben soils in an irregular pattern. In a few small areas the surface layer has been rilled and thinned by erosion.

The Maben soils have a brown fine sandy loam to clay loam surface layer about 6 inches thick. The upper part of the subsoil, about 20 inches thick, is yellowish-red heavy clay loam to clay. It is underlain by stratified layers of sand and clay rich in mica and shale fragments.

These soils are slightly acid to very strongly acid. Permeability is moderately slow. The available water capacity is medium to high. Runoff is rapid, and if these soils are cultivated, the erosion hazard is moderate. Proper use of crop residue and soil-improving crops should be practiced to reduce the erosion hazard and to maintain tilth. These soils tend to crust and pack if left idle.

Most of this mapping unit has remained in woodland, but some is in pasture. Small grains, pasture, and pine trees are suitable. Because of slope, rapid runoff, and erosion, pasture and trees are particularly suitable. (Capability unit IVe-3; woodland suitability group 3c2; wildlife suitability group 6)

Maben and Ruston soils, 12 to 30 percent slopes (MrF).—This mapping unit consists dominantly of well-drained Maben and Ruston soils. These soils occur on narrow ridgetops and long side slopes. Some areas consist of Maben fine sandy loam, some of Ruston fine sandy loam, and some of a combination of the two.

The Maben soil makes up 20 to 50 percent of this mapping unit and averages about 31 percent. The Ruston soil makes up 15 to 40 percent and averages about 19 percent. Minor soils that make up the rest of the mapping unit are the Boswell and Prentiss soils, and a soil similar to Maben but having a strong-brown to yellowish-brown subsoil. In a few delineations, Wilcox soils are included.

The Maben soil occurs mainly on the lower two-thirds of the side slopes, but some of it is on the narrow ridgetops. This soil has a brown fine sandy loam to clay loam surface layer about 6 inches thick. The upper part of the subsoil, about 20 inches thick, is yellowish-red silty clay or clay. Below this are stratified layers of sand and clay rich in mica and shale fragments.

The Maben soil is slightly acid to very strongly acid. Permeability is moderately slow. The available water capacity is medium to high.

The Ruston soil occurs mainly on the narrow ridgetops and on the upper third of the side slopes. It has a dark-brown fine sandy loam surface layer, about 7 inches thick, that is underlain by thick yellowish-red sandy clay loam.

The Ruston soil is medium acid to very strongly acid. Permeability is moderate. The available water capacity is medium.

Most of this mapping unit has remained as woodland. Minor areas, mostly on ridgetops and a few side slopes, are in cultivation. Because of slope, rapid runoff, and high erosion hazard, this mapping unit should be kept in permanent vegetation, such as pine trees and adapted hardwoods. (Both soils, capability unit VIIe-3; Maben part, woodland suitability group 3c2, Ruston part, woodland suitability group 3o1; both soils, wildlife suitability group 6)

Mantachie Series

The Mantachie series consists of somewhat poorly drained, strongly acid to very strongly acid soils that formed in loamy alluvium.

In a representative profile, the surface layer is mottled dark-brown, yellowish-brown, and grayish-brown loam, about 8 inches thick. It is underlain to a depth of about 19 inches by mottled yellowish-brown and light brownish-gray loam. Below this, to a depth of about 60 inches, is a light-gray or light brownish-gray loam that has mottles in shades of brown.

Representative profile of Mantachie loam, in pasture approximately 3/4 mile southeast of Sturgis, 500 feet east of blacktop road, and 400 feet south of Sand Creek, SW1/4SW1/4 sec. 15, T. 17 N., R. 12 E.

Ap—0 to 8 inches, mottled dark-brown (10YR 4/3), yellowish-brown (10YR 5/5), and grayish-brown (2.5Y 5/2) loam; weak, fine, granular structure; friable; many fine roots; few, fine, brown and black concretions; strongly acid; clear, smooth boundary.

B21—8 to 19 inches, mottled yellowish-brown (10YR 5/4, 5/8) and light brownish-gray (10YR 6/2) loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; common, fine, brown and black concretions; very strongly acid; gradual, smooth boundary.

B22g—19 to 29 inches, light-gray (10YR 6/1) loam; many, fine and medium, distinct, yellowish-brown (10YR 5/4, 5/8) mottles; weak to moderate, fine and medium, subangular blocky structure; friable, slightly sticky; few fine roots; common to many, fine and medium, brown and black concretions; very strongly acid; gradual, smooth boundary.

B23g—29 to 41 inches, light-gray (10YR 6/1) loam; common to many, fine and medium, distinct, yellowish-brown (10YR 5/4, 5/8) mottles and few, fine, distinct, pale-brown mottles; weak to moderate, fine and medium, subangular blocky structure; friable, slightly sticky; few fine roots; common, fine and medium, brown and black concretions; very strongly acid; gradual, smooth boundary.

B24g—41 to 60 inches, light brownish-gray (10YR 6/2) loam; many, medium and coarse, distinct, yellowish-brown (10YR 5/8) mottles; weak to moderate, fine and medium, subangular blocky structure; friable, slightly sticky; few fine roots; common to many, fine and medium, brown and black concretions; very strongly acid.

The Ap horizon is mottled dark brown, yellowish brown, and grayish brown, or has dominant colors in one of these with mottles. The Ap horizon ranges from silt loam, loam, or fine sandy loam. The upper B horizon is mottled in shades of brown, yellow, and gray or has dominant colors in shades of brown or yellow with few to many mottles of gray. The lower B horizon has a light-gray or light brownish-gray matrix, that has common to many mottles in shades of brown or yellow, or mottles in shades of gray, brown, and yellow. The B horizon is loam, sandy clay loam, and silt loam. The clay content at a depth of 10 to 40 inches ranges from 18 to 35 percent. Brown and black concretions range from few to many. Reaction ranges from strongly acid to very strongly acid, except in areas that have been limed.

The Mantachie soils occur with the Ochlockonee, Mathiston, and Urbo soils. The Mantachie soils are less well drained and are finer textured than the Ochlockonee soils. The Mantachie soils are similar to the Mathiston soils in drainage, but are not as silty in the B horizon. They differ from the Urbo soils in that the Urbo soils are more clayey throughout.

Mantachie loam (Ms).—This somewhat poorly drained alluvial soil is on flood plains. Slopes range from 0 to 2 percent.

Included with this soil in mapping were small areas of Ochlockonee soils along stream channels and a few areas of somewhat poorly drained soils having a fine sandy loam subsoil. Also included were soils in small low areas that are more poorly drained.

This soil is strongly acid to very strongly acid. Permeability is moderate. The available water capacity is high to medium. Runoff is slow, and there is some ponding in low areas. Soil tilth can be maintained, and crusting and packing reduced by properly managing crop residue.

More than half of this soil is in pasture or small grains. The rest is in bottom-land hardwoods. With adequate drainage and proper fertilization, this soil is suited to cotton, corn, small grain, soybeans, pasture, pine trees, and adapted hardwoods. Crops can be damaged by flooding. (Capability unit IIw-4; woodland suitability group 1w9; wildlife suitability group 2)

Marietta Series

The Marietta series consists of moderately well drained, medium acid to moderately alkaline soils. These soils formed in mixed loamy alluvium.

In a representative profile, the surface layer is dark grayish-brown fine sandy loam about 6 inches thick. This is underlain to a depth of about 15 inches by yellowish-brown loam. Below this, to a depth of about 55 inches, is sandy clay loam mottled by shades of brown and gray.

Representative profile of Marietta fine sandy loam in a cultivated area about 2 1/2 miles north of Starkville, one-half mile east, 80 yards south of gravel road, and 120 feet west of stream channel under TVA power line, NW1/4 NE1/4 sec. 23, T. 19 N., R. 14 E.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) fine sandy loam; common, fine and medium, distinct, brown (10YR 5/3) and dark-brown (10YR 4/3) mottles; weak, fine, granular structure; very friable; common fine roots; neutral; clear, smooth boundary.

B21—6 to 15 inches, yellowish-brown (10YR 5/4) loam; many, fine and medium, distinct, brown (10YR 5/3) and pale-brown (10YR 6/3) mottles; weak, fine and medium, subangular blocky structure; friable; few fine roots and brown and black concretions; mildly alkaline; clear, smooth boundary.

B22—15 to 26 inches, mottled yellowish-brown (10YR 5/4) and light brownish-gray (10YR 6/2) sandy clay loam; weak to moderate, fine and medium, subangular blocky structure; friable to firm; slightly plastic, slightly sticky; few fine roots; few to common, fine, brown and black concretions; mildly alkaline; gradual, wavy boundary.

B23—26 to 55 inches, mottled yellowish-brown (10YR 5/6), light brownish-gray (10YR 6/2), strong-brown (7.5YR 5/6), and dark-brown (10YR 4/3) sandy clay loam; weak to moderate, fine and medium, subangular blocky structure; friable to firm, slightly plastic, slightly sticky; common, fine and medium, brown and black concretions; mildly alkaline.

The Ap horizon is dark grayish brown to brown. The B21 horizon is yellowish brown to brown and has mottles in shades of brown. The B22 horizon has colors similar to those of the B21 horizon and has grayish mottles, or mottles of brown, gray, or yellow. The lower horizons have grayish matrix colors and few to many brown and yellow mottles or mottles of gray, brown, and yellow. The B horizon is loam, sandy clay loam, clay loam, or silty clay loam. The clay content at a depth of 10 to 40 inches ranges from 18 to 35 percent. In the A and upper B horizons brown and black concretions range from few to none, and from few to many in the lower horizons. Reaction ranges from medium acid to moderately alkaline.

The Marietta soils occur with the Leeper and Catalpa soils. The Marietta soils differ from the Leeper and Catalpa soils in that the Leeper and Catalpa soils have a more clayey B horizon with a darker surface layer.

Marietta fine sandy loam (Mt).—This moderately well drained alluvial soil is on flood plains. Slopes range from 0 to 2 percent.

Included with this soil in mapping were small areas of Leeper and Catalpa soils and some areas that have up to 10 inches of loamy overwash material. In some areas near the stream channels, soils were included that have less clay. Also included were some areas having up to 18 inches of material that ranges from loam to fine sandy loam and from strongly acid to moderately alkaline.

This soil is medium acid to moderately alkaline. Permeability of the surface layer and subsoil is moderate. The available water capacity is high. Runoff is slow. Soil tilth is good and should be maintained by proper use of crop residue. The soil tends to crust and pack when left bare.

Most of this soil is in cultivated crops, hay, or pasture. The rest is in hardwoods. This soil is well suited to cotton, corn, soybeans, small grains, grain sorghum, pasture, and adapted hardwoods. Crops may be damaged by flooding. (Capability unit IIw-5; woodland suitability group 1w5; wildlife suitability group 1)

Mathiston Series

The Mathiston series consists of somewhat poorly drained, strongly acid to very strongly acid soils that formed in loamy alluvium.

In a representative profile, the surface layer is dark-brown silt loam about 6 inches thick. It is underlain to a depth of about 14 inches by a dark-brown silt loam. Below this, to a depth of 39 inches, is grayish-brown silt loam, and this material is underlain to a depth of about 52 inches by silty clay loam mottled in shades of brown.

Representative profile of Mathiston silt loam in a cultivated area about 9 miles west of Starkville city limits, 1½ miles northwest of U.S. Highway No. 82, 100 feet west of blacktop road and 120 feet south of field entrance, SW¼SW¼ sec. 11, T. 19 N., R. 12 E.

Ap—0 to 6 inches, dark-brown (10YR 4/3) silt loam; few, fine, faint, light brownish-gray mottles; moderate, fine, granular structure; friable; common fine roots; few, fine, brown and black concretions; strongly acid; clear, smooth boundary.

B21—6 to 14 inches, dark-brown (10YR 4/3) silt loam; common, fine, distinct, grayish-brown mottles; weak, fine, subangular blocky structure; friable, slightly sticky; few fine roots and brown and black concretions; very strongly acid; clear, smooth boundary.

B22g—14 to 22 inches, grayish-brown (10YR 5/2) silt loam; many, fine, distinct, dark-brown and few, fine and medium, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, fine and medium, subangular blocky structure; friable, slightly sticky; few fine roots; few to common, fine, brown and black concretions; very strongly acid; gradual, wavy boundary.

B23g—22 to 39 inches, grayish-brown (2.5Y 5/2) silt loam; common, fine, distinct, dark-brown and yellowish-brown mottles; weak to moderate, medium, subangular blocky structure; friable, slightly sticky; few fine roots; common, fine and medium, brown and black concretions; water table at depth of 39 inches; very strongly acid; gradual, smooth boundary.

B3g—39 to 52 inches, mottled grayish-brown (2.5Y 5/2), yellowish-brown (10YR 5/6), and dark yellowish-brown (10YR 4/4) silty clay loam; massive to weak, medium, subangular blocky structure; friable, slightly plastic and sticky; common, fine and medium, brown and black concretions; very strongly acid.

The Ap horizon is dark brown to brown and is mottled in some places. The upper part of the B horizon is mottled in shades of brown, yellow, and gray or has a dominant color of dark brown or yellowish brown and few to many mottles of grayish brown or gray. The lower parts of the Bg horizon are dominantly grayish brown to gray and have few to many mottles in shades of gray, brown, or yellow. The B horizon is silt loam or silty clay loam. The clay content at a depth of 10 to 40 inches ranges from 18 to 30 percent. In the upper part of the B horizon, most areas of this soil have few to common, brown and black concretions, and in the lower part the concretions are common to many. Reaction of these soils ranges from strongly acid to very strongly acid, except where the Ap has been limed.

The Mathiston soils occur with Urbo, Mantachie, and Ochlockonee soils. The Mathiston soils are similar to the Urbo soils in drainage, which are finer textured in the B horizon. They are similar to the Mantachie soils in drainage but are more silty in the B horizon. The Mathiston soils are less well drained, finer textured, and more silty at depths of 10 to 40 inches than the Ochlockonee soils.

Mathiston silt loam (Mu).—This soil is on flood plains. Slopes range from 0 to 2 percent.

Included with this soil in mapping were areas that have 4 to 10 inches of sandier overwash materials. Also included were small areas of poorly drained soils, and near some of the stream channels, small areas of Ochlockonee soils.

This soil is strongly acid to very strongly acid. Permeability is moderate. The available water capacity is very high. Runoff is slow, and there is ponding in some low areas. Soil tilth is only fair but can be maintained by proper use of crop residue.

About half the acreage has been cleared and is in pasture, row crops, and hay. The rest is in bottom-land hardwoods. With adequate drainage and proper fertilization, row and forage crops, cotton, corn, soybeans, small grains, pasture, pine trees, and some hardwoods are suitable. Crops may be damaged by flooding. (Capability unit IIw-4; woodland suitability group 1w9; wildlife suitability group 2)

Myatt Series

The Myatt series consists of poorly drained, strongly acid to very strongly acid soils that formed in loamy materials. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is gray loam about 4 inches thick. The subsurface layer, about 6 inches thick, is loam mottled with shades of gray and brown. It is underlain to a depth of about 38 inches by a light brownish-gray silt loam mottled with shades of brown. Below this, to a depth of about 60 inches, is a light-gray silt loam mottled with shades of brown.

Representative profile of Myatt loam, in pasture, located about 11 miles south of State College, 320 yards east of Oktoc Road intersection and 520 feet south of gravel road, NW¼NW¼ sec. 32, T. 17 N., R. 15 E.

Ap—0 to 4 inches, gray (10YR 5/1) loam; few to common, fine, faint and distinct, light-gray and yellowish-brown mottles; weak, fine, granular structure; friable; many fine roots; few, fine, brown and black concretions; medium acid; clear, smooth boundary.

A2g—4 to 10 inches, gray (10YR 5/1) and light-gray (10YR 6/1) silt loam; common, fine and medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine and medium, granular and subangular blocky structure; friable; common fine roots; few, fine, brown and black concretions; few, fine, strong-brown stains along root channels; very strongly acid; clear, smooth boundary.

B21tg—10 to 18 inches, light brownish-gray (10YR 6/2) silt loam; many, fine and medium, distinct, yellowish-brown (10YR 5/6, 5/8) and few, fine, distinct, strong-brown mottles; weak, medium, subangular blocky structure; firm; few fine roots; few, fine, brown and black concretions; patchy clay films on ped faces; some sand grains that have clay bridges and coats; few fine voids; very strongly acid; gradual, wavy boundary.

B22tg—18 to 38 inches, light brownish-gray (10YR 6/2) silt loam; common to many, fine and medium, distinct, yellowish-brown (10YR 5/6) and light yellowish-brown (10YR 6/4) mottles and few, fine, distinct, strong-brown mottles; weak to moderate, fine and medium, subangular blocky structure; firm, slightly plastic; few fine roots; few, fine, brown and black concretions; patchy clay films on ped faces; sand grains have clay bridges and coats; common fine pores; few gray silt coats on ped faces; very strongly acid; gradual, wavy boundary.

B23tg—38 to 60 inches, light-gray (10YR 6/1) silt loam; few to common, fine and medium, distinct, pale-brown (10YR 6/3) and strong-brown (7.5YR 5/8) mottles; moderate, medium, subangular blocky structure; firm, plastic and sticky; few fine roots; few, fine, brown and black concretions; clay films in pores and patchy on ped faces; sand grains have clay bridges and coats; some gray silt coats on ped faces and in cracks; very strongly acid.

The Ap and A2 horizons are gray, light brownish gray, or grayish brown and in places have mottles in shades of brown or yellow. These horizons are silt loam, loam, or fine sandy loam. In a few undisturbed areas there is an A1 horizon 1 to 3 inches thick that is dark gray or very dark gray. The B2tg horizon is light brownish gray or gray, and in places has few to many mottles in shades of brown and yellow. This horizon is loam, silt loam, clay loam, or sandy clay loam and is 18 to 35 percent clay in the upper 20 inches. Brown and black concretions range from few to many. Reaction of the Myatt soils ranges from strongly acid to very strongly acid except in areas that have been limed.

The Myatt soils occur with Stough, Prentiss, and Adaton soils. The Myatt soils differ from the Stough and Prentiss soils, in that the Stough and Prentiss soils are better drained and have a fragipan. The Myatt soils are similar to the Adaton soils in drainage and clay content, but Myatt soils have more than 15 percent fine to coarse sand in the upper 20 inches of the B horizon.

Myatt loam (My).—This soil occurs on broad areas. Slope ranges from 0 to 2 percent.

Included with this soil in mapping were small areas of Adaton and Stough soils, and a few areas of a poorly drained soil with a fragipan. Also included were a few areas that have a silt loam or sandy loam surface layer.

This soil is strongly acid to very strongly acid. Permeability is moderately slow. The available water capacity is medium to high. Runoff is slow, and the removal of surface water is a problem. Proper use of crop residue and sod crops should be practiced to maintain soil tilth and to reduce crusting and packing.

Most of this soil is in pasture or hay. The rest is woodland. Because of a high seasonal water table and slow runoff, this soil is suited to pasture plants, adapted hardwoods, and pine trees. (Capability unit IVw-1; woodland suitability group 2w9; wildlife suitability group 5)

Ochlockonee Series

The Ochlockonee series consists of well-drained, strongly acid to very strongly acid soils. These soils formed in loamy alluvium materials near major stream channels.

In a representative profile, the surface layer is dark-brown loam about 7 inches thick. This layer is underlain to a depth of about 28 inches by yellowish-brown sandy loam. Below this, to a depth of about 52 inches, is a loam mottled with shades of brown and gray.

Representative profile of Ochlockonee loam, in a cultivated area about 400 feet south of the Noxubee River and 40 feet west of Morgantown Road, NW¼NW¼ sec. 31, T. 17 N., R. 13 E.

Ap—0 to 7 inches, dark-brown (10YR 4/3) loam; weak, fine, granular structure; very friable; common fine roots; few, fine, brown and black concretions; strongly acid; clear, smooth boundary.

C1—7 to 20 inches, yellowish-brown (10YR 5/4) sandy loam with few, fine, faint, pale-brown mottles; structureless; massive; friable; few fine roots; few, fine, brown and black concretions; few wormholes filled with material from Ap horizon; few sand pockets; strongly acid; gradual, smooth boundary.

C2—20 to 28 inches, yellowish-brown (10YR 5/4) sandy loam; common, fine, distinct, light brownish-gray and dark yellowish-brown mottles; weak, fine and medium, subangular blocky structure; friable; few fine roots; few, fine, brown and black concretions; few sand pockets; strongly acid; clear, smooth boundary.

C3—28 to 36 inches, mottled yellowish-brown (10YR 5/4), light brownish-gray (10YR 6/2), and yellowish-brown (10YR 5/8) loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; few to common, brown and black concretions; few fine pores; very strongly acid; gradual, wavy boundary.

C4—36 to 52 inches, mottled gray (10YR 6/1) and yellowish-brown (10YR 5/8) loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; few to common, fine and medium, brown and black concretions; common fine pores; very strongly acid.

The Ap horizon ranges from dark brown to brown and is silt loam, fine sandy loam, or loam. The C1 horizon is yellowish-brown, brown, or dark yellowish brown. Bedding planes are few and thin and are dominantly between depths of 0 to 20 inches. Sand pockets are common between depths of 10 and 20 inches. The C1 horizon is loam, silt loam, or sandy loam, and the clay content ranges from 10 to 18 percent. The C2, C3, and C4 horizons are dominantly shades of brown or yellow with few to many mottles of gray or of gray, brown, and yellow. In the upper 20 inches brown and black concretions range from few to none, but they are few to common in the lower horizons. Reaction of these soils ranges from strongly acid to very strongly acid except in areas that have received lime.

These soils have better formed subsoil below a depth of 20 inches than is defined as the range of the Ochlockonee series, but this difference does not alter their usefulness and behavior.

The Ochlockonee soils occur with Mantachie and Mathiston soils. The Ochlockonee soils are better drained than the Mantachie and Mathiston soils and are coarser textured at depths of 10 to 40 inches. The Ochlockonee soils contain less silt than the Mathiston soils.

Ochlockonee loam (Oc).—This well-drained soil occurs on flood plains along some of the major stream channels, in bands 50 to 500 feet wide. Slopes range from 0 to 2 percent.

Included with this soil in mapping were areas of soils that are similar in drainage but have a finer textured subsoil. Also included were small areas of Mantachie and Mathiston soils.

This soil is strongly acid to very strongly acid. Permeability is moderate. The available water capacity is medium. Runoff is slow. Tilth is good, and the soil can be cultivated throughout a wide range of moisture content. Proper use of crop residue should be practiced to prevent crusting and packing of the soil.

Most of this soil is cultivated or in hay. The rest is in bottom-land hardwoods or pasture. If properly managed and fertilized, this soil is well suited to cotton, corn, soybeans, small grain, pasture, and truck crops. Crops may be damaged by flooding. Pine trees and adapted hardwoods are well suited. (Capability unit IIw-6; woodland suitability group 2o7; wildlife suitability group 2)

Oktibbeha Series

The Oktibbeha series consists of moderately well drained soils that formed in beds of acid clays overlying marly clays or chalk. Slopes range from 2 to 17 percent.

In a representative profile, the surface layer is mixed dark grayish-brown and dark-brown silty clay loam about 4 inches thick. This silty clay is underlain to a depth of about 16 inches by a red or yellowish-red clay. Below this, to a depth of about 34 inches, is clay or silty clay mottled with shades of red, brown, and gray. This material is underlain by a marly clay mottled with shades of brown, gray, and yellow. Chalk is at a depth of about 45 inches.

Representative profile of Oktibbeha silty clay loam in a pasture about 1¾ miles south of Sessum, 120 feet east of intersection, on south side of gravel road, NE¼ NE¼ sec. 34, T. 18 N., R. 15 E.

Ap—0 to 4 inches, mixed dark grayish-brown (10YR 4/2) and dark-brown (7.5YR 4/4) silty clay loam; moderate, fine and medium, granular and subangular blocky structure; friable to firm; common fine roots; strongly acid; clear, smooth boundary.

B21t—4 to 12 inches, red (2.5YR 4/6) clay; few, fine and medium, distinct, strong-brown (7.5YR 5/6) mottles; strong, fine and medium, subangular and angular blocky structure; firm, plastic and sticky; few to common fine roots; common cracks filled with Ap material; continuous clay films or pressure faces on peds; very strongly acid; clear, smooth boundary.

B22t—12 to 16 inches, yellowish-red (5YR 4/8) clay; common, fine and medium, distinct, red (2.5YR 4/6) and yellowish-brown (10YR 5/4) mottles; strong, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; few fine roots; continuous clay films or pressure faces on peds; very strongly acid; gradual, wavy boundary.

B23t—16 to 24 inches, mottled strong-brown (7.5YR 5/6), yellowish-red (5YR 4/6), and light olive-gray (5YR 6/2) clay; strong, fine and medium, angular blocky structure; firm, very plastic, very sticky; few fine roots; few fine concretions; continuous clay films or pressure faces on peds; few slickensides that do not intersect; very strongly acid; gradual, wavy boundary.

B3—24 to 34 inches, strong-brown (7.5YR 5/6) silty clay or clay; common, fine and medium, distinct, yellowish-brown (10YR 5/4) and light brownish-gray (2.5YR 6/2) mottles; moderate, medium and fine, angular blocky structure; firm, very plastic, very sticky; few fine roots; few, fine, brown and black concretions; common to many very dark grayish-brown stains in lower 3 inches; patchy clay films or pressure faces on peds; few to common slickensides that do not intersect; strongly acid; clear, wavy boundary.

C—34 to 45 inches, mottled light-gray (2.5Y 7/2), pale-yellow (2.5Y 7/4), and light olive-brown (2.5Y 5/4) marly clay; massive; some platy rock structure; firm, slightly plastic and slightly sticky; common lime nodules and concretions; moderately alkaline; gradual, irregular boundary.

R—45 to 60 inches, very firm chalk in fine to coarse horizontal plates.

The Ap horizon is dominantly dark grayish-brown, dark brown, or brown and ranges from silty clay loam or silt loam to fine sandy loam. The B21t and B22t horizons are red to yellowish red, and some profiles have few to common mottles in shades of brown. The B23t and B3 horizons have matrix colors of strong brown or yellowish brown and common to many mottles in shades of gray, olive, and red, or brown, gray, red, and olive. The B2t horizon is silty clay or clay, and common to many slickensides are within the upper 40 inches. The depth to the marly clay or chalk ranges from 24 to 54 inches. Reaction of these soils ranges from strongly acid to very strongly acid through the B2 and the B3 horizons. Reaction in the C horizon ranges from slightly acid to moderately alkaline.

These soils are less clayey than is defined as the range for the Oktibbeha series, but this difference does not alter their usefulness and behavior.

The Oktibbeha soils occur with Kipling, Sumter, and Boswell soils. The Oktibbeha soils have less yellow in the B horizon than the Kipling soils, which have gray mottles in the upper B horizon. They differ from the Sumter soils in that the Sumter soils have a pale-olive B horizon with more than 40 percent calcium carbonates in the upper 40 inches. The Oktibbeha soils differ from the Boswell soils in that the Boswell soils are more acid throughout, have a thicker B horizon, and lack the calcareous underlying material.

Oktibbeha silty clay loam, 2 to 5 percent slopes, eroded (OlB2).—This soil is moderately well drained and occurs mostly on narrow ridgetops adjoining the rough steep slopes.

The surface layer has been rilled and thinned by erosion. In a few places the subsoil is exposed.

Included with this soil in mapping were small areas of Kipling, Boswell, and Sumter soils. Also included were a few areas that have a sandy loam and silt loam surface layer.

This soil is very strongly acid to strongly acid. Permeability is slow to very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. The soil has fair tilth in the uneroded areas but poor tilth where part of the subsoil has been mixed with the plow layer. Runoff is slow to medium, and if this soil is cultivated the erosion hazard is slight to moderate. Proper use of crop residue and soil-improving crops should be practiced to reduce erosion and maintain soil tilth.

Most of this soil is in pasture and in row crops. The rest has been allowed to remain mainly in scrub hardwoods, but some scattered areas are in pine. This soil is suited to cotton, corn, small grain, soybeans, pasture, pine trees, and adapted hardwoods. (Capability unit IIIe-3; woodland suitability group 3c8; wildlife suitability group 4)

Oktibbeha silty clay loam, 5 to 8 percent slopes, eroded (OlC2).—This moderately well drained soil occurs on ridgetops and side slopes.

The surface layer is dark grayish-brown silty clay loam, about 4 inches thick, that has been thinned by erosion. In a few areas the subsoil is exposed and has been cut by a few rills or shallow gullies. The upper part of the subsoil, about 10 inches thick, is a red or yellowish-red silty clay or clay; it is underlain by mottled clay over chalk.

Included with this soil in mapping were small areas of Boswell and Kipling soils and a few areas of a soil that has an acid, yellowish-red subsoil underlain by chalk at depths of less than 20 inches. A few areas have a sandy loam or loam surface layer. Also included were a few areas that are severely eroded that have many shallow gullies.

This soil is very strongly acid to strongly acid. Permeability is slow to very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. Runoff is medium, and if this soil is cultivated the hazard of erosion is moderate. Tilth can be maintained and erosion reduced by proper use of crop residue and soil-improving crops.

Most of this soil is in pasture, hay, or row crops. A few areas are wooded. Because of slope and erosion, this soil should be used mainly for pasture and trees. It is suited to soybeans, grain sorghum, small grains, pasture, adapted hardwoods, and pine trees. (Capability unit IVe-2; woodland suitability group 3c8; wildlife suitability group 4)

Oktibbeha soils, 8 to 17 percent slopes, severely eroded (OtE3).—These soils occur on side slopes and ridgetops. Some areas consist of Oktibbeha silty clay loam, some of Oktibbeha and Kipling soils, and some of a combination of Oktibbeha, Kipling, Boswell, and Sumter soils. These soils occur without regularity of pattern. Almost all delineations contain Oktibbeha soils, and most delineations contain Kipling.

Included with these soils in mapping were areas of Savannah soils on ridgetops and upper side slopes, of Sumter and Boswell soils on side slopes and ridgetops, and of Leeper and Marietta soils in the narrow alluvial areas. Also included were a few areas of a soil with yellowish-red, acid subsoil and firm chalk within a 20-inch depth.

Erosion on these soils is variable, but in most areas the surface layer has been rilled and thinned. In many areas the subsoil is exposed and deep gullies are common.

The Oktibbeha soils occur on narrow ridgetops as well as the side slopes. The upper part of their subsoil is red to yellowish-red silty clay or clay, and this is underlain by mottled clay and calcareous material.

The Kipling soils occur dominantly on the lower third of the slopes. The upper part of their subsoil is yellowish brown with grayish mottles in the upper 10 inches, and this is underlain by mottled clay over alkaline material.

The Boswell soils occur on narrow ridgetops as well as the side slopes. They have yellowish-red silty clay or clay in the upper part of the subsoil and are underlain by mottled silty clay.

The soils of this mapping unit are strongly acid to very strongly acid. Permeability is slow to very slow. Available water capacity is medium to high. Runoff is rapid, and erosion is a serious hazard. These soils shrink and crack during dry periods.

Most of this mapping unit is in pasture, and the rest is in cutover woodland. Because of slope, rapid runoff, and severe erosion hazard, the soils in this mapping unit should be kept in permanent vegetation. Commonly grown pasture plants and pine trees are suitable for this purpose. (Capability unit VIe-1; woodland suitability group 3c8; wildlife suitability group 4)

Oktibbeha Series, Thick Solum Variant

The thick solum variant of the Oktibbeha series consists of moderately well drained soils on uplands. These soils formed in beds of strongly acid to very strongly acid clay. Slopes range from 5 to 8 percent.

In a representative profile, the surface layer is dark-brown fine sandy loam about 4 inches thick. This sandy loam is underlain by yellowish-red loam to a depth of about 9 inches. Below this is yellowish-red clay that extends to a depth of 35 inches and is mottled in the lower part. This clay is underlain to a depth of 55 inches by clay loam mottled in shades of red, gray, and brown.

Representative profile of Oktibbeha fine sandy loam, thick solum variant, in a pasture about 2 miles south of MSU campus, on beef farm, 250 feet north and 500 feet west of SE. corner of SE¼SE¼ sec. 14, T. 18 N., R. 14 E.

Ap—0 to 4 inches, dark-brown (10YR 4/3) fine sandy loam; few, fine, distinct, yellowish-red mottles; weak, fine, granular structure; very friable; common to many fine roots; few wormcasts; strongly acid; clear, smooth boundary.

B1—4 to 9 inches, yellowish-red (5YR 4/8) loam; weak, fine, granular and subangular blocky structure; friable; common fine roots; common worm and root holes filled with dark brown Ap material; strongly acid; clear, smooth boundary.

B21t—9 to 17 inches, yellowish-red (5YR 4/6) clay; moderate to strong, fine and medium, subangular blocky and angular blocky structure; firm, plastic and sticky; few fine roots; few, fine, brown and black concretions; few worm and root holes filled with dark brown Ap material; continuous clay films or pressure faces on peds; very strongly acid; gradual, smooth boundary.

B22t—17 to 22 inches, yellowish-red (5YR 4/6) clay; common, fine, prominent, dark-red (2.5YR 3/6) and strong-brown (7.5YR 5/6) mottles; moderate to strong, fine and medium, subangular blocky and angular blocky structure; firm, plastic and sticky; few fine roots; few, fine, brown and black concretions; continuous clay films or pressure faces on peds; few fine slickensides that do not intersect; very strongly acid; gradual, smooth boundary.

B23t—22 to 35 inches, reticulately mottled dark-red (2.5YR 3/6), strong-brown (7.5YR 5/6), and light brownish-gray (10YR 6/2) clay; moderate, fine and medium, subangular and angular blocky structure; firm, plastic and sticky; few fine roots; few, fine, brown and black concretions; patchy clay films or pressure faces on peds; few fine and medium slickensides that do not intersect; very strongly acid; gradual, wavy boundary.

B3t—35 to 55 inches, reticulately mottled dark-red (2.5YR 3/6) light brownish-gray (2.5YR 6/2), and strong-brown (7.5YR 5/6) clay loam; moderate, fine and medium, subangular blocky structure; firm, plastic and sticky; few fine roots; few, fine, brown and black concretions; patchy clay films or pressure faces on some peds; strongly acid.

The Ap horizon is grayish brown, dark brown, or brown and is fine sandy loam, loam, or silt loam. The B1 horizon is strong-brown or yellowish-red loam or clay loam. The upper part of the B2t horizon is yellowish-red or red clay or silty clay. The lower part of the B2t horizon is mottled in shades of red, brown and gray, and the texture is clay or silty clay. The clay content of the upper 20 inches ranges from 40 to 60 percent. The B3t horizon is mottled red, brown, and gray or has a grayish matrix color with mottles.

The thickness of the solum is more than 50 inches. Reaction is strongly acid or very strongly acid throughout.

These soils are variants to the Oktibbeha series because they have less clay in the B horizon and have lower shrink-swell properties and a thicker solum.

The Oktibbeha thick solum variants occur with Kipling and Maben soils. These variants differ from the Kipling soils, in that the Kipling soils have a yellower B horizon and have gray mottles in the upper part of the B horizon. These Oktibbeha variants are similar to Maben soils in color, but the thickness of solum in the Maben soils is less than 50 inches, and the Maben soils are stratified in the C horizon.

Oktibbeha fine sandy loam, thick solum variant, 5 to 8 percent slopes, eroded (OhC2).—This soil is moderately well drained and moderately sloping. It occurs on ridgetops and side slopes.

Included with this soil in mapping were small areas of Maben and Kipling soils and a few areas of a soil that is similar in color and drainage but has less than 35 percent clay in the upper 20 inches of the subsoil. Also included were a few small areas that have a loam or silt loam surface layer.

This soil is strongly acid to very strongly acid. Permeability is slow to very slow. The available water capacity is high. Runoff is medium, and if this soil is cultivated, the erosion hazard is moderate to severe. This soil tills easily except in areas where most of the original surface layer is absent. Proper use of crop residue and the use of soil-improving crops should be practiced to reduce the erosion hazard and to reduce crusting and packing.

Approximately 75 percent of this soil is in pasture or hay. Some of it is in mixed hardwoods and pine trees, and the rest is in woodland. This soil is suited to soybeans, grain sorghum, small grain, pasture plants, and pine trees. Because of slope and erosion, it is more suitable for permanent vegetation. (Capability unit IVe-2; woodland suitability group 3c8; wildlife suitability group 4)

Prentiss Series

The Prentiss series consists of moderately well drained, strongly acid to very strongly acid soils that have a fragipan. These soils formed in loamy material. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is dark-brown silt loam about 5 inches thick. This layer is underlain to a depth of about 23 inches by a yellowish-brown silt loam. Below this, to a depth of about 52 inches, is silt loam that is mottled with shades of brown, yellow, and gray and is firm, compact, and brittle. Below this, to a depth of about 60 inches, is silty clay loam that is mottled with shades of gray and brown, and is firm, compact, and brittle.

Representative profile of Prentiss silt loam in a pasture, approximately 2¼ miles southwest of Longview, less than half a mile northwest of State Route 12, and 150 feet north of gravel road, SE¼SW¼ sec. 29, T. 18 N., R. 13 E.

Ap—0 to 5 inches, dark-brown (10YR 4/3) silt loam; common, fine, distinct, dark yellowish-brown mottles; weak, fine, granular structure; friable; many fine roots; few, fine, brown and black concretions; strongly acid; clear, smooth boundary.

B21—5 to 17 inches, yellowish-brown (10YR 5/6) silt loam; few, fine, distinct, pale-brown mottles; weak, fine and medium, subangular blocky structure; friable; few fine roots; few brown and black concretions; some clay bridging on a few sand grains; strongly acid; clear, wavy boundary.

B22—17 to 23 inches, yellowish-brown (10YR 5/6) silt loam; common, fine and medium, distinct, pale-brown (10YR 6/3) mottles and few, fine, distinct, light brownish-gray mottles; weak, fine and medium, subangular blocky structure; firm; few fine roots; few, fine, brown and black concretions; few fine pores; common clay coating and bridging on a few sand grains; strongly acid; clear, wavy boundary.

Bx1—23 to 52 inches, mottled yellowish-brown (10YR 5/4), light brownish-gray (10YR 6/2), and brownish-yellow (10YR 6/8) silt loam; weak, medium, prismatic structure parting to weak, fine and medium, subangular blocky structure; firm, compact and brittle; few fine roots; few to common, fine and medium, brown and black concretions; patchy clay films in pores; clay bridging on sand grains; common fine voids; very strongly acid; gradual, wavy boundary.

Bx2—52 to 60 inches, mottled light-gray (10YR 6/1), yellowish-brown (10YR 5/4), and strong-brown (7.5YR 5/8) silty clay loam; moderate, fine and medium, subangular blocky structure; firm, compact and brittle; few to common, fine and medium, brown and black concretions; patchy clay films on ped faces; sand grains have clay bridging and coating; very strongly acid.

The Ap horizon is dark brown, brown, or dark grayish brown. The B2 horizon is dominantly yellowish brown or light yellowish brown. The Bx horizon is usually mottled in shades of yellow, brown, and gray, or has a matrix color of yellowish brown and common to many, distinct mottles of gray and brown. The B2 horizon is dominantly silt loam or loam but ranges to fine sandy loam. The clay content ranges from 10 to 18 percent, and the silt content ranges from 35 to 65 percent. The Bx horizon is similar to the B2 horizon in texture, except in some soils the clay content ranges to more than 18 percent. Few to many brown and black concretions are throughout the soil and are more numerous in the fragipan. The Bx horizon is 19 to 30 inches beneath the surface. Reaction of these soils ranges from strongly acid to very strongly acid except in areas that have been limed.

The Prentiss soils occur with Savannah, Stough, Longview, Freestone, Myatt, and Providence soils. The Prentiss and Savannah soils are similar in drainage, but the Prentiss soils have a coarser textured B horizon above the fragipan. Prentiss soils are similar to Stough soils in texture, but the Stough soils have few to many gray mottles in the upper 10 inches of the B horizon. The Prentiss soils are better drained than the Freestone soils, which have more clay in the solum and do not have a fragipan. The Prentiss soils have less clay in the upper B horizon than the Myatt soils, which have dominantly grayish colors. The Prentiss and Providence soils are similar in drainage, but the Providence soils have more clay and are more silty in the B horizon above the fragipan, and are also underlain at a depth of 30 to 48 inches by a clayey lower B horizon. Prentiss soils are better drained, coarser textured, and less silty than the Longview soils.

Prentiss silt loam, 0 to 2 percent slopes (PnA).—This moderately well drained soil occurs on terraces and uplands.

Included with this soil in mapping were small areas of Savannah, Longview, Providence, heavy substratum, and Stough soils. Also included were some areas in the south-central section of the county where the surface layer is fine sandy loam.

This soil is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil, but moderately slow through the fragipan. The available water capacity is medium. The soil has good tilth and can be worked throughout a wide range of moisture content. Runoff is slow, and if this soil is cultivated, the erosion hazard is slight to none. The soil has a tendency to crust and pack when left idle.

About 75 percent of this soil is in row crops or pasture. The rest is in cutover hardwoods and pine trees. This soil is well suited to cotton, corn, soybeans, small grains, pasture, adapted hardwoods, and pine trees. (Capability unit IIw–7; woodland suitability group 2o7; wildlife suitability group 5)

Prentiss silt loam, 2 to 5 percent slopes (PnB).—This moderately well drained soil occurs on terraces and uplands.

The surface layer is dark-brown or dark grayish-brown silt loam about 4 inches thick. The upper part of the subsoil, about 15 inches thick, is yellowish-brown silt loam. This silt loam is underlain at a depth of 19 to 26 inches by a thick, mottled, gray, brown, and yellow fragipan.

Included with this soil in mapping were small areas of Savannah soils and Providence soils, heavy substratum. In a few small areas the surface layer has been rilled and thinned by erosion and is a mixture of the original surface layer with subsoil material. Also included were a few areas in the south-central part of the county where the surface layer is fine sandy loam.

This soil is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil but moderately slow through the fragipan. The available water capacity is medium. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight. This soil is easily tilled, but proper use of crop residue should be practiced in order to maintain tilth and help prevent crusting and packing.

Most of this soil is in cultivation or used for pasture; some of it is in mixed pine trees and hardwoods. This soil is well suited to cotton, corn, soybeans, small grains, pasture, adapted hardwoods, and pine trees. (Capability unit IIe–1; woodland suitability group 2o7; wildlife suitability group 5)

Providence Series

The Providence series consists of moderately well drained, strongly acid to very strongly acid soils that have a fragipan. These soils formed in loamy over clayey materials. Slopes range from 2 to 8 percent.

In a representative profile, the surface layer is dark grayish-brown silt loam about 4 inches thick. This silt loam is underlain to a depth of about 21 inches by a strong-brown to yellowish-brown silty clay loam. Below this, to a depth of about 45 inches, is a firm, compact and brittle silty clay loam that is yellowish brown in the upper part but becomes light brownish gray in the lower part. This compact layer is underlain by silty clay mottled with shades of gray and brown.

Representative profile of Providence silt loam, heavy substratum, in woodland located about 2 miles southwest of Starkville city limits, 7 miles west of State Route 12, 800 feet east of church, 150 feet north of gravel road, SE¼SE¼ sec. 1, T. 18 N., R. 12 E.

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) silt loam; few to common, fine, distinct, dark-brown and strong-brown mottles; weak, fine, granular structure; friable; common fine and medium roots; few, fine, brown and black concretions; some mixing with lower horizon; medium acid; clear, smooth boundary.

B21t—4 to 16 inches, strong-brown (7.5YR 5/6) silty clay loam; moderate, fine and medium, subangular blocky structure; friable to firm, slightly plastic and slightly sticky; few, fine and medium roots; few, fine and medium, brown and black concretions; patchy clay films on ped faces; some Ap horizon mixed in upper 3 inches; very strongly acid; clear, smooth boundary.

B22t—16 to 21 inches, yellowish-brown (10YR 5/6) silty clay loam; few, fine and medium, distinct, pale-brown (10YR 6/3) and strong-brown (7.5YR 5/6) mottles; moderate, fine and medium, subangular blocky structure; friable to firm, slightly plastic and slightly sticky; few fine and medium roots; common, fine and medium, brown and black concretions; patchy clay films on ped faces; very strongly acid; clear, wavy boundary.

Bx1—21 to 34 inches, yellowish-brown (10YR 5/4) silty clay loam; common, fine and medium, distinct, light brownish-gray (10YR 6/2) and strong-brown (7.5YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, fine and medium, subangular blocky structure; firm, compact and brittle, slightly plastic and slightly sticky; few fine roots; few to common, fine and medium, brown and black concretions; few fine voids; patchy clay films on ped faces; some sand grains bridged and coated; very strongly acid; gradual, wavy boundary.

Bx2—34 to 45 inches, light brownish-gray (2.5YR 6/2) silty clay loam; common to many, fine and medium, distinct, yellowish-brown (10YR 5/4) and strong-brown (7.5YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, fine and medium, subangular blocky structure; firm, compact and brittle, slightly plastic and slightly sticky; few fine roots; common, fine and medium, brown and black concretions; few fine voids; some gray silt coats on peds; patchy clay films on ped faces; very strongly acid; gradual, wavy boundary.

IIB23t—45 to 60 inches, mottled light-gray (10YR 6/1) and yellowish-brown (10YR 5/8) silty clay; moderate, fine and medium, subangular blocky and angular blocky structure; firm, plastic and sticky; few fine roots; few to common, fine and medium, brown and black concretions; some gray silt coats on peds and in seams; patchy clay films on ped faces; very strongly acid.

The Ap horizon is dominantly dark grayish-brown, grayish-brown, or dark brown. The Bt horizon is strong-brown to yellowish-brown silt loam or silty clay loam with mottles in shades of brown. The clay content of the B2t horizon ranges from 18 to 32 percent, and the fragipan is yellowish brown with common to many mottles in shades of gray, brown, and yellow or is entirely mottled with gray, brown, and yellow. The Bx horizon is similar to the B2t horizon in texture. The Bx horizon ranges from 16 to 27 inches in depth. The IIB23t horizon is mottled in shades of gray, brown, and yellow and is dominantly silty clay loam, silty clay, or clay. Depth to this clayey layer ranges from 30 to 48 inches. In these soils, brown and black concretions range from few to many and are more numerous in the Bx and lower horizons. Reaction ranges from strongly acid to very strongly acid except in areas that have been limed.

The Providence soils occur with Savannah, Prentiss, Longview, and Wilcox soils. The Providence soils are similar to the Savannah and Prentiss soils in drainage, but the Providence soils have more silt in the B horizon above the fragipan, whereas the Prentiss soils contain less clay in the upper part of the B horizon. The Providence soils are similar to the Longview soils in texture, but the Longview soils have gray mottles within 16 inches of the surface. The Providence soils differ from the Wilcox soils, in that the Wilcox soils have a clayey B horizon and have gray mottles in the upper 10 inches of the B horizon.

Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded (PsB2).—This is a moderately well drained soil on ridgetops. In many areas the surface layer has been thinned by erosion, and in a few small areas the subsoil has been exposed and has a few rills.

Included with this soil in mapping were small areas of Savannah, Falkner, and Wilcox soils; a few areas of a soil having a similar upper subsoil that contains a clayey layer instead of a fragipan; and a few areas that have a high sand content in the surface layer and upper part of the subsoil. Also included were areas where the clayey substratum ranges from a depth of 48 to 60 inches.

This soil is strongly acid to very strongly acid. Permeability of the upper subsoil is moderate, but moderately slow through the fragipan and clayey layer. The available water capacity is medium. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight to moderate. The soil tills easily, but proper use of crop residue should be practiced to prevent crusting and packing.

Approximately three-fourths of this soil is in pasture or hay, and minor areas are in cultivation. The rest is in mixed hardwoods and pine trees. This soil is well suited to cotton, corn, soybeans, grain sorghum, small grains, pasture plants, adapted hardwoods, and pine trees. (Capability unit IIe–2; woodland suitability group 3o7; wildlife suitability group 5)

Providence silt loam, heavy substratum, 5 to 8 percent slopes, eroded (PsC2).—This moderately well drained soil is on side slopes and ridgetops.

The surface layer is dark grayish-brown silt loam about 4 inches thick. In many areas the surface layer has been thinned by erosion. In a few areas the subsoil has been exposed, and in some fields there are a few small gullies or rills. The upper part of the subsoil, about 16 inches thick, is strong-brown to yellowish-brown silty clay loam. It is underlain at a depth of 26 inches by a fragipan mottled in shades of yellow, gray, and brown. The fragipan is underlain at a depth of about 40 inches by a clayey layer.

Included with this soil in mapping were small areas of Savannah and Wilcox soils; a few areas of a soil that has a similar upper subsoil but has a clayey layer instead of the fragipan; and a few areas that have a loam surface layer. Also included were areas where the clayey substratum is 48 to 60 inches from the surface.

This soil is very strongly acid to strongly acid. Permeability is moderate in the upper part of the subsoil but moderately slow through the fragipan and clayey layer. The available water capacity is medium. Runoff is medium, and if this soil is cultivated, the erosion hazard is moderate. The soil works easily, but proper use of crop residue should be practiced to prevent erosion, crusting, and packing.

Less than half of this soil is in pasture or hay. A few small areas are in cultivation, and the rest is in mixed hardwoods and pine trees. This soil is suited to cotton, corn, soybeans, grain sorghum, small grains, pasture, adapted hardwoods, and pine trees. (Capability unit IIIe–4; woodland suitability group 3o7; wildlife suitability group 5)

Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded (PsC3).—This moderately well drained soil is on side slopes.

The dark-brown silt loam surface layer, about 2 inches thick, is a mixture of the subsoil material and remnants of the original surface layer. The subsoil has been exposed in many areas and is interspersed with scattered areas of the original surface layer. Shallow gullies and a few deep ones are common. The upper subsoil, about 14 inches thick, is a yellowish-brown to strong-brown silt loam to silty clay loam. It is underlain at a depth of about 16 inches by a fragipan mottled in shades of yellow, gray, and brown. The fragipan is underlain at a depth of about 30 inches by a clayey layer.

Included with this soil in mapping were small areas of Wilcox soils; a few areas of a soil that has a similar upper subsoil but has a clayey layer instead of a fragipan; and a few areas of soils that have a silty clay loam surface layer. Also included were areas where the clayey layer is 48 to 60 inches from the surface.

This soil is very strongly acid to strongly acid. Permeability is moderate in the upper part of the subsoil but moderately slow in the fragipan and clayey layer. The available water capacity is medium. Runoff is medium to rapid, and the erosion hazard is severe if this soil is cultivated. On this soil, a surface cover is needed as much of the time as possible, as this reduces the erosion hazard and the crusting and packing.

Most of this soil has been in cultivation, but most of it now has been converted to pasture or allowed to revert to woodland. Because of slope and erosion, this soil is better suited to grass or trees, but it is also suited to cotton, corn, small grains, and grain sorghum. (Capability unit IVe–4; woodland suitability group 3o7; wildlife suitability group 5)

Ruston Series

The Ruston series consists of well-drained, medium acid to very strongly acid soils that formed in loamy materials. Slopes range from 2 to 30 percent.

In a representative profile, the surface layer as dark-brown fine sandy loam about 9 inches thick. The subsurface layer, to a depth of about 15 inches, is pale-brown sandy loam. This loam is underlain to a depth of about 32 inches by yellowish-red sandy clay loam. Below this, to a depth of about 55 inches, is strong-brown loam or sandy loam. This, in turn, is underlain to a depth of about 80 inches by yellowish-red sandy loam or loam that is mottled with shades of yellow, red, and gray in the lower part.

Representative profile of Ruston fine sandy loam, in a wooded area about 2¼ miles south of U.S. Highway No. 82, 300 feet east of Maben-Sturgis Road, on east bank of gravel road and northeast of sand pit, SE¼NE¼ sec. 20, T. 19 N., R. 12 E.

Ap—0 to 9 inches, dark-brown (10YR 4/3) fine sandy loam with few, fine and medium, pale-brown spots; weak, fine, granular structure; very friable; common, fine and medium roots; common, fine, black specks; strongly acid; clear, wavy boundary.

A2—9 to 15 inches, pale-brown (10YR 6/3) sandy loam; few, fine and medium, distinct, light-gray (10YR 6/1) mottles; weak, fine, granular structure; very friable to loose; few, fine and medium roots; common fine pores; strongly acid; gradual, smooth boundary.

B2t—15 to 32 inches, yellowish-red (5YR 4/6) sandy clay loam; moderate, fine and medium, subangular blocky structure; friable; few streaks of A2 horizon in root channels; few fine and medium roots; patchy clay films on peds; sand grains coated with clay; very strongly acid; gradual, smooth boundary.

B3—32 to 43 inches, strong-brown (7.5YR 5/6) loam; few fine to coarse spots and streaks of yellowish brown (10YR 5/6) and pale brown (10YR 6/3); weak, fine and medium, subangular blocky structure; friable; few fine roots; patchy clay films, mostly in strong-brown areas; some clay bridging of sand grains; very strongly acid; gradual, wavy boundary.

B3&A'2—43 to 55 inches, strong-brown (7.5YR 5/6, 5/8) sandy loam; few, fine to coarse, vertical streaks and pockets of light yellowish brown (10YR 6/4) and light gray (10YR 6/1); weak, fine, granular structure and single grain; very friable to loose; few fine roots; some bridging of sand grains in dark yellowish-brown areas and clean sand in gray areas; very strongly acid; clear, irregular boundary.

B'21t—55 to 67 inches, yellowish-red (5YR 5/8) sandy loam; common, fine to coarse streaks and pockets of light yellowish brown (10YR 6/4) and light gray (10YR 6/1); weak to moderate, fine and medium, subangular blocky structure; firm; few fine roots; patchy clay films on ped faces; sand grains bridged and coated with clay; gray sand coats on many ped faces; very strongly acid; clear, irregular boundary.

B'22t—67 to 80 inches, mottled brownish-yellow (10YR 6/8), yellowish red (5YR 5/8), and light-gray (10YR 7/1) loam; moderate, fine and medium, subangular blocky structure; firm; patchy clay films on ped faces; very strongly acid.

The Ap horizon is brown, dark brown, or yellowish brown. The A2 ranges from pale brown or grayish brown to brown. The B1 horizon, when present, is yellowish brown or strong brown and is fine sandy loam or loam. The B2t horizon is yellowish red, red, or reddish yellow and ranges from sandy loam to clay loam, but is dominantly sandy clay loam. The B3, or B3 & A'2, layer. Where present, is at a depth of about 30 to 48 inches, is strong brown with pockets in shades of brown and gray, and is dominantly sandy loam. The colors of the B'2t are similar to those of the B2t, or the horizon is mottled in red, gray, and yellow. The B'2t horizon is sandy loam to sandy clay loam. Reaction of these soils ranges from medium acid to very strongly acid.

The Ruston soils occur with Boswell, Maben, and Savannah soils. The Ruston soils are less clayey in the B2t horizon than the Boswell and Maben soils. More than 35 percent of the upper part of the B2t horizon of the Boswell and Maben soils is clay. The Ruston soils are less yellow than the Savannah soils and do not have a fragipan.

Ruston fine sandy loam, 2 to 5 percent slopes (RtB).—This is a well-drained soil on ridgetops.

Included with this soil in mapping were small areas of Maben and Savannah soils. Also included were some areas of soils having slopes of up to 8 percent. In a few cultivated areas, the surface layer has been thinned by erosion, and where this has occurred, this layer is a mixture of the original surface layer with material from the subsoil.

This soil is very strongly acid to medium acid. Permeability is moderate, and the available water capacity is medium. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight. This soil tills easily and can be worked throughout a wide range of moisture content. This soil tends to crust and pack when left bare.

Most of this soil has been cultivated in the past. Some has been allowed to revert to mixed hardwoods and pine trees, and a few small areas are in orchards. This soil is well suited to cotton, corn, soybeans, grain sorghum, small grains, pasture, orchards, truck crops, and pine trees. (Capability unit IIe-3; woodland suitability group 3o1; wildlife suitability group 6)

Ruston and Maben soils, 12 to 30 percent slopes (RuE).—These soils are well drained and occur on narrow ridgetops and long side slopes. Some areas are made up of Ruston fine sandy loam, some of Maben fine sandy loam, and some of a combination of the two.

The Ruston soils make up about 33 percent of this mapping unit, and the Maben soils make up about 19 percent. The rest is made up of soils that are similar to the Ruston soils but differ in having a thinner subsoil, and of other soils that have a sandy loam surface layer more than 20 inches thick and a yellowish-red to strong-brown subsoil. In the narrow flood plains are Mantachie and Ochlockonee soils.

The pattern and extent of Ruston and Maben soils are not very uniform in this mapping unit. Both soils usually occur in all areas, but in some areas only one of these soils occurs with one or more of the minor soils.

Included with these soils in mapping were a few eroded areas that were once cultivated.

The Ruston soil occurs dominantly on the upper and middle side slopes, but in some places is on the narrow ridgetops. The surface layer is a dark-brown fine sandy loam, about 5 inches thick, and is underlain by a yellowish-red clay loam subsoil. This soil is medium acid to very strongly acid. Permeability is moderate, and the available water capacity is medium. Runoff is rapid.

The Maben soil generally occurs on the middle and lower side slopes, but in some places is on the narrow ridgetops. The surface layer is a dark grayish-brown fine sandy loam about 4 inches thick. The upper part of the subsoil, about 16 inches thick, is yellowish-red clay to clay loam. Below this is a red loam to a depth of about 41 inches, which is underlain by stratified layers of sands and clays with remnants of acid shale. This soil is slightly acid to very strongly acid. Permeability is moderately slow. The available water capacity is medium to high.

The soils of this mapping unit are wooded for the most part, but a few of the ridgetops and upper side slopes have been cultivated in the past. Because of slope, rapid runoff, and the high erosion hazard, these soils should be kept in permanent vegetation such as pine trees and in adapted hardwoods. (Both soils, capability unit VIIe-3; Ruston part, woodland suitability group 3o1, Maben part, woodland suitability group 3c2; both soils, wildlife suitability group 6)

Savannah Series

The Savannah series consists of moderately well drained, strongly acid or very strongly acid soils with a fragipan. These soils formed in loamy materials. Slopes range from 2 to 12 percent.

In a representative profile, the surface layer is dark grayish-brown fine sandy loam about 4 inches thick. It is underlain by a strong-brown loam that reaches to a depth of about 22 inches. Below this is a firm, compact, brittle, yellowish-brown loam that is mottled in shades of gray and brown and extends to a depth of more than 60 inches.

Representative profile of Savannah fine sandy loam in a pasture about 11 miles south of Starkville, 2 miles west of State Route 25, half a mile north of Craig Springs Road, and 300 yards west of gravel road, SE¼NW¼ sec. 21, T. 17 N., R. 13 E.

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) fine sandy loam; common, fine and medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine, granular structure; very friable; few to common, fine and medium roots; few, fine, brown and black concretions; few worm casts; some mixing with upper part of B2t horizon; strongly acid; clear, smooth boundary.

B21t—4 to 16 inches, strong-brown (7.5YR 5/6) loam; few, fine and medium, distinct, yellowish-brown mottles (10YR 5/6); moderate, fine and medium, subangular blocky structure; friable; few, fine and medium roots; few, fine, brown and black concretions; sand grains bridged and coated with clay; patchy clay films in pores and on ped faces; very strongly acid; gradual, wavy boundary.

B22t—16 to 22 inches, strong-brown (7.5YR 5/8) loam; few to common, fine and medium, distinct, yellowish-brown (10YR 5/6) and pale-brown (10YR 6/3) mottles; moderate, fine and medium, subangular blocky structure; friable; few fine roots; few to common, fine and medium, brown and black concretions; common fine pores; sand grains bridged and coated with clay; patchy clay films in pores and on ped faces; very strongly acid; clear, wavy boundary.

Bx1—22 to 48 inches, yellowish-brown (10YR 5/6) loam; common to many, fine and medium, distinct, light-gray (10YR 6/1) and strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; firm, compact and brittle; few fine roots; few to common, fine to coarse, black and brown concretions; common fine voids; few spots and tongues of light-gray material that is heavier in texture; discontinuous clay films on ped faces and continuous films in pores; very strongly acid; gradual, wavy boundary.

Bx2—48 to 60 inches, mottled yellowish-brown (10YR 5/8), light-gray (10YR 6/1), and brownish-yellow (10YR 6/3) sandy clay loam; weak to moderate, fine and medium, subangular blocky structure; firm, compact and brittle, slightly plastic; few fine roots; few to common, fine and medium, brown and black concretions; few fine pores; patchy clay films on ped faces and in pores; sand grains bridged and coated; very strongly acid.

The Ap horizon ranges from dark grayish brown to brown or dark brown, and from fine sandy loam to loam or silt loam. The B2t horizon ranges from strong brown to yellowish brown. The upper 20 inches of the B2t horizon is dominantly heavy loam, but this horizon ranges to clay loam, has a clay content ranging from 18 to 32 percent, and has more than 15 percent sand that is coarser than very fine. The Bx horizon ranges from sandy loam to clay loam but is more commonly loam. The Bx horizon ranges from about 18 to 28 inches in depth. Brown and black concretions range from few to many and are more numerous in the fragipan. Reaction of these soils ranges from strongly acid to very strongly acid except in areas that have been limed.

The Savannah soils occur with Ruston, Boswell, Prentiss, Stough, Maben, and Providence soils. Savannah soils have a fragipan, which the Ruston soils do not, and are less red than the Ruston soils. The Savannah soils are also less red than the Boswell and Maben soils, which have a heavier textured B horizon. The Savannah soils have a finer textured B horizon above the fragipan than that in the Prentiss soils. They are better drained than the Stough soils, which have gray mottles in the upper part of the B horizon and are lighter textured. The Savannah soils are similar to the Providence soils in drainage, but differ in that they have less silt above the fragipan, and in that the Providence soils are underlain at a depth of 30 to 48 inches by a clayey layer.

Savannah fine sandy loam, 2 to 5 percent slopes, eroded (SaB2).—This is a gently sloping soil on ridgetops. It has the profile described as representative for the series. A few shallow gullies or rills occur in a few fields.

Included with this soil in mapping were small areas of Prentiss, Ruston, and Providence soils, and a few small areas that have a fragipan, 8 to 20 inches thick, that overlies a thick clayey layer. Also included were a few areas that have a loam or silt loam surface layer.

This soil is very strongly acid to strongly acid. Permeability is moderate in the upper part of the subsoil, but moderately slow through the fragipan. The available water capacity is medium. Runoff is slow, and if this soil is cultivated, the erosion hazard is slight to moderate. This soil is easily tilled, but proper use of crop residue should be practiced to maintain tilth and prevent crusting and packing. A plowpan may form if depth of plowing is not varied.

Most of this soil has been cultivated in the past, and some has been allowed to revert to woodland. Most of it is in pasture, and small areas are in cultivation. This soil is well suited to cotton, corn, soybeans, grain sorghum, pasture, and pine trees. (Capability unit IIe-1; woodland suitability group 3o7; wildlife suitability group 6)

Savannah fine sandy loam, 5 to 8 percent slopes, eroded (SaC2).—This soil occurs on ridgetops and side slopes.

The surface layer is dark grayish-brown fine sandy loam about 4 inches thick. In most of the areas the surface layer has been thinned by erosion and is a mixture of the original surface layer with material from the subsoil. In a few places the subsoil is exposed. In some fields there are a few shallow gullies or rills. The upper part of the subsoil, about 18 inches thick, is strong-brown to yellowish-brown loam. It is underlain at a depth of about 22 inches by a thick fragipan mottled in shades of brown, gray, and yellow.

Included with this soil in mapping were small areas of Ruston and Prentiss soils, and a few areas of soils that have clayey materials underlying a thin fragipan. Also included were a few areas that have a loam or silt loam surface layer.

This soil is very strongly acid to strongly acid. Permeability is moderate in the upper part of the subsoil but moderately slow through the fragipan. The available water capacity is medium. Runoff is medium, and if this soil is cultivated, the erosion hazard is moderate. The soil tills easily, but proper use of crop residue should be practiced to reduce the erosion hazard and to reduce crusting and packing.

Most of this soil has been cultivated, and some has reverted to woodland. Most of it is in pasture. This soil is suited to cotton, corn, soybeans, grain sorghum, small grains, pasture, and pine trees. (Capability unit IIIe-2; woodland suitability group 3o7; wildlife suitability group 6)

Savannah fine sandy loam, 8 to 12 percent slopes, eroded (SaD2).—This soil is on side slopes.

The surface layer is dark grayish-brown or brown fine sandy loam about 3 inches thick. In most areas the surface layer has been thinned and rilled by erosion. In a few areas there are a few deep gullies. The upper part of the subsoil, about 16 inches thick, is strong-brown clay loam. This is underlain at a depth of about 19 inches by a thick, mottled, gray, yellow, and brown fragipan.

Included with this soil in mapping were small areas of Wilcox, Boswell, Ruston, and Prentiss soils.

This soil is very strongly acid to strongly acid. Permeability is moderate in the upper part of the subsoil but moderately slow through the fragipan. The available water capacity is medium. Runoff is rapid, and where this soil is cultivated, the erosion hazard is moderate to severe. The soil tills easily, but proper use of crop residue and close-growing crops helps to reduce the erosion hazard.

Approximately half of this soil has been cleared and is in pasture or in pine trees. A few small areas are in cultivation. The rest is in forest. This soil is suited to grain sorghum, small grains, pasture, and pine trees. Because of slope and erosion hazard, it is perferably used for pasture or trees. (Capability unit IVe–1; woodland suitability group 3o7; wildlife suitability group 4)

Sessum Series

The Sessum series consists of poorly drained, medium acid to very strongly acid soils on uplands. These soils formed in beds of clay over thick beds of calcareous chalk or marly clay. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is dark grayish-brown silty clay loam about 6 inches thick. This layer is underlain to a depth of about 58 inches by a light brownish-gray or light olive-gray clay. Below this is a light olive-brown clay, or a clay mottled with shades of brown, gray, and yellow, that becomes moderately alkaline with depth and contains a few calcium carbonate concretions.

Representative profile of Sessum silty clay loam in a cultivated area about 3 miles south of the intersection of State Routes 12 and 25, on the southwest side of Starkville, 130 yards west of Highway 25 and 45 feet north of field road, SW¼SW¼ sec. 16, T. 18 N., R. 14 E.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silty clay loam; weak, fine, granular and subangular blocky structure; friable; common fine roots; common, fine, brown and black concretions; very strongly acid; abrupt, smooth boundary.

B21tg—6 to 24 inches, light brownish-gray (2.5YR 6/2) clay; many, fine and medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; few to common fine roots; clay films or pressure faces on peds; few, fine, brown and black concretions; very strongly acid; gradual, wavy boundary.

B22tg—24 to 30 inches, light olive-gray (5YR 6/2) clay; common, fine and medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular and angular blocky structure; firm, very plastic, very sticky; few fine roots; few, fine, black and brown concretions; clay films or pressure faces on peds; few fine and medium slickensides that do not intersect; very strongly acid; gradual, wavy boundary.

B23tg—30 to 43 inches, light olive-gray (5Y 6/2) clay; few to common, fine, distinct, light olive-brown and yellowish-brown mottles; moderate, fine and medium, subangular and angular blocky structure; firm, very plastic and very sticky; few fine roots; few, fine, brown and black concretions; clay films or pressure faces on peds; common, medium to coarse slickensides that do not intersect; very strongly acid; gradual, wavy boundary.

B3g—43 to 58 inches, light olive-gray (5Y 6/2) clay; few, fine, faint, gray mottles; weak, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; few, fine, black and brown concretions; common to many, medium and coarse slickensides that intersect; very strongly acid; gradual, wavy boundary.

C1—58 to 68 inches, light olive-brown (2.5Y 5/4) clay; common, fine, distinct, light olive-gray mottles; massive; firm, very plastic, very sticky; few, fine, black and brown concretions; medium acid; gradual, wavy boundary.

C2—68 to 85 inches, mottled yellowish-brown (10YR 5/6), light olive-gray (2.5Y 6/2), and olive-yellow (2.5Y 6/6) clay; massive; firm, very plastic, very sticky; common, fine, black and brown concretions; few, fine and medium calcium carbonate concretions; moderately alkaline.

The Ap horizon is dark grayish brown or grayish brown. The B2tg horizon is light brownish gray to light olive gray and has few to many, distinct mottles in shades of yellow, brown, and olive. The B2tg horizon is silty clay or clay, and the clay content ranges from 50 to 60 percent. The B3 horizon is light brownish gray or light olive gray and has mottles in shades of brown, yellow, gray, and olive. The C horizons have the same color, including shades of brown, or are mottled in shades of brown, gray, and yellow; these horizons are silty clay or clay. Within a depth of about 10 to 40 inches, there are slickensides that do not intersect, but slickensides that intersect are below a depth of 40 inches. Reaction ranges from very strongly acid to medium acid in the upper part of the solum and from medium acid to moderately alkaline in the lower part of the solum and the C horizon. Brown and black concretions range from few to many.

The Sessum soils occur with Kipling and Adaton soils. The Sessum soils are grayer than the Kipling soils, which have a yellowish-brown B horizon that contains gray mottles. The Sessum soils are finer textured than the Adaton soils.

Sessum silty clay loam (Se).—This is a poorly drained soil on broad upland flats. Slopes range from 0 to 2 percent. This soil has the profile described as representative for the series.

Included with this soil in mapping were small areas of Kipling and Adaton soils, and a few areas of a soil that has dominantly a yellowish-brown subsoil. Also included were a few areas of soils that have a silt loam surface layer, and areas of soils that have slopes of up to 5 percent.

This soil is very strongly acid to medium acid, but it becomes moderately alkaline in the deeper horizons. Permeability is very slow. The available water capacity is high. The soil shrinks and cracks during dry periods. It is difficult to work and often produces poor crops. Because it is very sticky when wet and hard when dry, it can be worked only within a narrow moisture range. Runoff is slow, and the hazard of erosion is slight.

Most of this soil is in pasture or hay, but a minor acreage is in row crops. This soil is suited to pasture, trees, and a few row crops. Soybeans, small grain, pine trees, and adapted hardwoods can be grown. (Capability unit IVw–2; woodland suitability group 3c8; wildlife suitability group 4)

Stough Series

The Stough series consists of somewhat poorly drained, strongly acid to very strongly acid soils that have a fragipan. These soils formed in loamy materials.

In a representative profile, the surface layer is brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish-brown fine sandy loam about 3 inches thick. This is underlain to a depth of about 18 inches by yellowish-brown loam mottled with light brownish gray. Below this, to a depth of about 60 inches, is firm, compact and brittle loam mottled with shades of brown and gray.

Representative profile of Stough fine sandy loam in an idle area about 12 miles south of Starkville, 3/4 mile north of the Noxubee River, and 30 feet east of gravel road in front of church, SW1/4NE1/4 sec. 26, R. 14 E., T. 17 N.

Ap—0 to 5 inches, brown (10YR 5/3) fine sandy loam; common, fine, distinct mottles of yellowish brown; weak, fine, granular structure; very friable; common fine roots; common, fine, brown and black concretions; strongly acid; clear, smooth boundary.

A2—5 to 8 inches, yellowish-brown (10YR 5/4) fine sandy loam; few to common, fine, distinct, grayish-brown mottles; weak, fine, granular and subangular blocky structure; friable; few fine roots; common, fine, brown and black concretions; very strongly acid; clear, wavy boundary.

B2t—8 to 18 inches, yellowish-brown (10YR 5/6) loam; common, fine and medium, distinct mottles of light brownish gray (10YR 6/2); weak, fine, subangular blocky structure; friable; few fine roots; few, fine, brown and black concretions; some bridging and coating of sand grains with clay, and patchy clay films on ped faces; very strongly acid; gradual, smooth boundary.

Bx1—18 to 47 inches, mottled yellowish-brown (10YR 5/4), light brownish-gray (2.5Y 6/2), and strong-brown (7.5YR 5/8) loam; weak, fine and medium, subangular blocky structure; firm, compact and brittle; few fine roots; few, fine, brown and black concretions; some bridging and coating of sand grains with clay; few, thin, patchy clay films; common fine voids; very strongly acid; gradual, wavy boundary.

Bx2—47 to 60 inches, mottled light yellowish-brown (10YR 6/4), gray (10YR 6/1), and yellowish-brown (10YR 5/6) loam; weak, fine and medium, subangular blocky structure; firm, compact and brittle; few, fine, brown and black concretions; common fine voids; sand grains bridged and coated with clay; very strongly acid.

The Ap horizon is brown, dark grayish brown, or dark brown. The A2 horizon is brown to yellowish brown or pale brown. The Ap and A2 horizons range from silt loam to fine sandy loam. In a few undisturbed wooded areas there is an A1 horizon 1 to 3 inches thick that ranges from dark gray to very dark gray. The B2t horizon is dominantly yellowish brown, but it ranges to brownish yellow with few to many gray or light brownish-gray mottles in the upper 10 inches. This horizon ranges from sandy loam to silt loam but is dominantly loam. Its clay content ranges from 8 to 15 percent. The Bx horizons are mottled mainly in shades of gray, brown, and yellow. These horizons have a range of texture similar to that of the B2t horizon, but in some profiles they have slightly more clay. The Bx horizons are at a depth of 18 to 22 inches. Reaction of these soils ranges from strongly acid to very strongly acid.

The Stough soils occur with Prentiss, Myatt, Longview, Savannah, and Freestone soils. The Stough soils are less well drained than the Prentiss and Savannah soils, which lack gray mottles in the upper 16 inches. Stough soils are better drained than Myatt soils, which have dominantly gray upper B horizons and lack a fragipan. Stough soils are similar to the Longview soils in drainage but have less clay above the fragipan. Stough soils are similar to the Freestone soils in drainage, but the Freestone soils have a finer textured B horizon and do not have a fragipan.

Stough fine sandy loam (St).—This soil is somewhat poorly drained and is on broad terraces and uplands. Slopes range from 0 to 2 percent.

Included with this soil in mapping were small areas of Myatt, Prentiss, and Longview soils, and a few areas of soils that have slopes up to 5 percent. Also included were some areas of soils that have a silt loam surface layer with a high sand content.

This soil is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil but is moderately slow through the fragipan. The available water capacity is medium. This soil is easy to till but tends to crust and pack if left bare. Runoff is slow, and seedbed preparation is often delayed in spring because of wetness.

Approximately half of this soil is in pasture or hay, and some minor areas are in cultivation. The rest is wooded. This soil is fairly well suited to cotton, corn, soybeans, and small grain, and well suited to pasture, adapted hardwoods, and pine trees. (Capability unit IIIw-3; woodland suitability group 2w8; wildlife suitability group 5)

Sumter Series

The Sumter series consists of well-drained, mildly alkaline to moderately alkaline soils. These soils formed in beds of marly clay over chalk.

In a representative profile, the surface layer is dark grayish-brown silty clay loam about 5 inches thick. It is underlain by light yellowish-brown and pale-olive silty clay that reaches to a depth of 20 inches. The next layer, to a depth of about 34 inches, is gray, marly clay. The underlying material is gray chalk that extends to a depth of 60 inches.

Representative profile of Sumter silty clay loam in a pasture about 330 yards north of State Route 25 and 230 feet west of Clay County line, SE1/4NE1/4 sec. 12, T. 19 N., R. 15 E.

Ap—0 to 5 inches, dark grayish-brown (2.5Y 4/2) silty clay loam; moderate, fine, granular structure; friable; common fine roots; evidence of much worm activity in this layer and the lower one; few, fine, brown and black concretions and lime concretions; moderately alkaline; calcareous; clear, smooth boundary.

B2—5 to 8 inches, light yellowish-brown (2.5Y 6/4) silty clay; moderate, fine, subangular blocky and granular structure; friable to firm; common fine roots; few, fine, brown and black concretions; few, fine, soft lime spots; common dark grayish-brown worm casts; moderately alkaline; calcareous; clear, smooth boundary.

B3—8 to 20 inches, pale-olive (5Y 6/4) silty clay; few to common, fine, distinct, yellow mottles; moderate, fine and medium, subangular blocky structure; friable to firm, slightly plastic and slightly sticky; few fine roots; few brown and black concretions; few, fine, white (10YR 8/2) lime nodules; common to many, medium chalk fragments; moderately alkaline; clear, wavy boundary.

C1—20 to 34 inches, gray (5Y 6/1) marly clay; common, fine and medium, distinct, olive-yellow mottles; common, coarse, vertical streaks of material similar to that in layer above; massive; has some platy rock structure; firm; few fine roots; few brown and black concretions; about 40 percent chalk fragments; few shell fragments; moderately alkaline; clear, irregular boundary.

C2—34 to 60 inches, gray (5Y 6/1) chalk; common to many, fine and medium, olive-yellow mottles; rock-controlled structure; very firm; can be dug with spade when moist; moderately alkaline.

The Ap horizon ranges from dark grayish brown to brown. The B horizon is light yellowish brown, olive, or pale olive in color and silty clay, clay, or silty clay loam in texture. The average clay content ranges from 40 to 60 percent. The C horizon ranges from firm marly clay to very firm chalk that can be cut with a spade when moist. The solum ranges from 20 to 50 inches in thickness. Reaction ranges from mildly alkaline to moderately alkaline throughout, and the calcium carbonate content ranges from 40 to 60 percent within 40 inches of the surface. The number of soft white limy spots and hardened lime nodules ranges from few to common.

The Sumter soils occur with Houston, Brooksville, Oktibbeha, Binnsville, and Kipling soils. The Sumter soils have a thinner, less dark A horizon and a thinner solum over chalk than the Houston and Brooksville soils. They have a thinner B horizon than the Oktibbeha and Kipling soils and lack the strongly acid reaction in the B horizon of those soils. The Sumter soils have a less dark A horizon than the Binnsville soils, which have firm chalk within 20 inches of the surface.

Sumter silty clay loam, 5 to 8 percent slopes, eroded (SuC2).—This soil is on uplands. It has the profile described as representative for the series. In some places the surface layer has been rilled and thinned by erosion and, where plowed, this layer is a mixture of the surface layer and the subsoil. In a few areas the subsoil is exposed. Some areas have a few gullies, but these are crossable with farm machinery.

Included with this soil in mapping were small areas of Binnsville, Brooksville, and Kipling soils. Also included were some areas where the slope is less than 5 percent, a few small areas where chalk crops out, and a few gullied areas not crossable with farm machinery.

This soil is mildly alkaline to moderately alkaline. Permeability of the subsoil is slow, and the available water capacity is medium. Runoff is medium, and where this soil is cultivated, the erosion hazard is moderate. Proper use of crop residue is needed to reduce erosion and maintain soil tilth.

Most of this soil has been cultivated, but it is now mostly in pasture or hay crops and, in some places, has been allowed to grow back to Osage-orange and cedar trees. Pasture is a suitable use for this soil. (Capability unit IVe–5; woodland suitability group 4c2c; wildlife suitability group 4)

Sumter silty clay loam, 8 to 12 percent slopes, eroded (SuD2).—This soil is on side slopes. It has a dark grayish-brown silty clay loam surface layer about 4 inches thick. In some places the surface layer has been thinned and rilled by erosion, and in other places the subsoil is exposed and a few deep gullies occur. The subsoil is pale-olive to olive silty clay that has mottles in shades of brown and yellow. It is underlain by firm, marly clay or chalk at a depth of 20 to 50 inches.

Included with this soil in mapping were a few areas of Binnsville and Kipling soils. Also included were a few areas that have some chalk outcrop and a few gullies not crossable with farm machinery. Some areas have slopes ranging up to 17 percent.

This soil is mildly alkaline to moderately alkaline. Permeability of the subsoil is slow, and the available water capacity is medium. Runoff is rapid, and the erosion hazard is moderate to severe.

Some of this soil is used for pasture and hay. The rest is in woodland. Because of the steep slopes and erosion hazard, this soil is better suited to pasture than to other uses. (Capability unit VIe–2; woodland suitability group 4c2c; wildlife suitability group 4)

Sumter and Binnsville soils, 2 to 5 percent slopes, eroded (SvB2).—This mapping unit consists of some areas of Sumter silty clay loam, some of Binnsville silty clay loam, and some of a combination of the two. The soils are dominantly well drained.

The Sumter soils make up about 29 percent of this mapping unit, and the Binnsville soils make up about 19 percent. Minor soils that make up the rest are Brooksville, Houston, and Kipling soils, and a soil similar to Binnsville soils but that differs in having a grayish-brown to dark grayish-brown surface layer. Also, Leeper and Catalpa soils are in some of the narrow alluvial areas.

The pattern and extent of the dominant Sumter and Binnsville soils are not uniform, but the soils can occur in all delineations with one or more of the minor soils. Some delineations consist of only one of the dominant soils.

Runoff is slow to medium, and the erosion hazard is slight to moderate. The degree of erosion is variable, but in most areas the surface layer has been thinned by erosion, and in a few areas the subsoil is exposed. In a few places, shallow gullies and small patches of chalk outcrops are common.

The Sumter soil has a dark grayish-brown silty clay loam surface layer and a pale-olive to olive silty clay subsoil that has brown and yellow mottles. It is underlain by marl or chalk at a depth of about 20 to 30 inches. The Sumter soil is mildly alkaline to moderately alkaline. Permeability of the subsoil is slow, and the available water capacity is medium.

The Binnsville soil has a very dark grayish-brown silty clay loam surface layer overlying light-gray marl or chalk at a depth of about 10 to 15 inches. The Binnsville soil is mildly alkaline to moderately alkaline. Permeability is slow, and the available water capacity is low because of the shallowness of the soil over chalk.

Most of the acreage has been cleared in the past. Some has been allowed to erode and revert to cedar and Osage-orange trees. Most of the rest is in pasture or hay, and some minor areas are in cultivation. These soils are suited to small grain and pasture plants. They need a plant cover as much of the time as possible to reduce the erosion hazard. (Both soils, capability unit IVe–5; Sumter part, woodland suitability group 4c2c; Binnsville part, woodland suitability group 4d3c; both soils, wildlife suitability group 4)

Sumter and Binnsville soils, 5 to 8 percent slopes, eroded (SvC2).—This mapping unit is on side slopes. Some areas consist of Sumter silty clay loam, some of Binnsville silty clay loam, and some of a combination of the two. The soils are dominantly well drained.

The Sumter soils make up about 35 percent of this mapping unit, and the Binnsville soils make up about 13 percent. Minor soils that make up the rest include a soil that has a thin, grayish-brown to dark grayish-brown surface layer and has firm chalk within 16 inches of the surface. Other minor soils are areas of Brooksville and Kipling soils and a soil similar to the Kipling soil but that differs in having marly clay or chalk within 20 inches of the surface. Also, Catalpa and Leeper soils are in some of the narrow alluvial areas near small drainageways and in the heads of short lateral drainageways.

The pattern and extent of the dominant Sumter and Binnsville soils are not uniform in this mapping unit, but the soils can occur in all delineations with one or more of the minor soils. Some delineations consist of only one of the dominant soils.

Runoff is medium, and the erosion hazard is moderate. The degree of erosion is variable, but in most areas the surface layer has been thinned by erosion, and, where plowed, it is a mixture of the surface layer and the subsoil. In a few areas the plow layer is a mixture of the surface layer and firm chalk fragments. Also, in a few areas, shallow gullies and small patches of chalk outcrops are common.

The Sumter soil has a dark grayish-brown silty clay loam surface layer and a pale-olive to olive silty clay subsoil that has brown and yellow mottles. It is underlain by marl or chalk at a depth of about 20 to 30 inches. The Sumter soil is mildly alkaline to moderately alkaline. Permeability is slow, and the available water capacity is medium.

The Binnsville soil has a very dark grayish-brown silty clay loam surface layer overlying light-gray marl or chalk at a depth of about 10 to 15 inches. The Binnsville soil is mildly alkaline to moderately alkaline. Permeability is slow, and the available water capacity is low because of the shallowness of the soil over chalk.

Most of the acreage has been cleared and used for cultivation in the past. Some has been allowed to erode and revert to cedar and Osage-orange trees. Most of the rest is in pasture or hay, and some minor areas are in cultivation. These soils are suited to pasture. They need a permanent plant cover to limit further erosion and decrease the runoff. (Both soils, capability unit VIe–2; Sumter part, woodland suitability group 4c2c; Binnsville part, woodland suitability group 4d3c; both soils, wildlife suitability group 4)

Urbo Series

The Urbo series consists of somewhat poorly drained, strongly acid to very strongly acid soils that formed in clayey alluvium.

In a representative profile, the surface layer is dark-brown silty clay loam about 5 inches thick. Below this, to a depth of more than 55 inches, is silty clay that is dark grayish brown or grayish brown in the upper part and light brownish gray in the lower part. Mottles in shades of brown are at a depth below 5 inches.

Representative profile of Urbo silty clay loam in a pasture about 1 mile south of Bradley, 410 feet west and 574 feet south of the NE. corner of NE¼NE¼ sec. 8, T. 17 N., R. 13 E.

Ap—0 to 5 inches, dark-brown (10YR 4/3) silty clay loam; weak, fine, subangular blocky structure; friable, slightly plastic; common fine roots; common, fine, brown and black concretions; very strongly acid; clear, smooth boundary.

B21—5 to 12 inches, dark grayish-brown (10YR 4/2) silty clay; few, fine, faint mottles of grayish brown and brown; weak to moderate, fine and medium, subangular blocky structure; firm, plastic, slightly sticky; common fine roots; common, fine, brown and black concretions; very strongly acid; gradual, smooth boundary.

B22g—12 to 18 inches, grayish-brown (2.5Y 5/2) silty clay; many, fine, distinct yellowish-brown (10YR 5/4) mottles; weak to moderate, fine and medium, subangular blocky structure; plastic and sticky; few fine roots; few to common brown and black concretions; very strongly acid; clear, smooth boundary.

B23g—18 to 55 inches, light brownish-gray (2.5Y 6/2) silty clay; common to many, fine and medium, distinct mottles of dark yellowish brown (10YR 4/4) and grayish brown (10YR 5/2); weak, fine and medium, subangular blocky structure; firm, very plastic; very sticky; few fine roots; few to common, fine and medium, brown and black concretions; very strongly acid.

The Ap horizon is dark brown to brown. The B21 and B22 horizons are dark grayish brown to grayish brown or are mottled in shades of brown, yellow, or gray. The lower part of the B horizon is dominantly gray to light brownish gray and has few to many mottles in shades of brown or yellow or in shades of gray, brown, and yellow. The B horizon is silty clay loam, clay loam, silty clay, or clay with a clay content ranging from 40 to 55 percent between depths of 10 and 40 inches. Brown and black concretions range from few to many. Reaction of these soils ranges from strongly acid to very strongly acid except in areas that have received lime.

The Urbo soils are associated with the Mathiston, Mantachie, and Leeper soils. The Urbo soils are similar to the Mathiston and Mantachie soils in drainage but are finer textured in the B horizon. The Urbo soils differ from the Leeper soils in that the Leeper soils are medium acid to moderately alkaline in reaction and have a darker surface layer.

Urbo silty clay loam (Ur).—This is a somewhat poorly drained soil having slopes of 0 to 2 percent.

Included with this soil in mapping were small areas of Mathiston and Mantachie soils, and some low areas of soils that are more poorly drained and have a gray subsoil. Also included were a few areas that have a silt loam surface layer.

This soil is strongly acid to very strongly acid. Permeability is very slow. The available water capacity is high. Runoff is slow, and ponding occurs in some low areas. Proper use of crop residue should be practiced to maintain soil tilth and help prevent crusting and packing.

Approximately half of this soil is cultivated or in pasture or hay. The rest is wooded. With adequate drainage and proper fertilization, this soil is suited to corn, soybeans, and grain sorghum. Pasture and adapted hardwoods are suitable. Crops may be damaged by flooding. (Capability unit IIw–8; woodland suitability group 2w6; wildlife suitability group 2)

Wilcox Series

The Wilcox series consists of somewhat poorly drained, extremely acid to strongly acid soils on uplands. These soils formed chiefly in thick beds of clay materials over shaly clay. Slopes range from 0 to 35 percent.

In a representative profile, the surface layer is dark yellowish-brown silty clay loam about 4 inches thick.

It is underlain to a depth of 8 inches by a yellowish-red silty clay. Below this, to a depth of about 42 inches, is a clay mottled with shades of red, gray, and brown. This is underlain by a grayish-brown or brown shaly clay mottled with olive brown.

Representative profile of a Wilcox silty clay loam, in an idle field located about 4 miles south of U.S. Highway No. 82, 0.8 mile east of Maben-Sturgis road and on south bank of blacktop road, NW¼NE¼ sec. 33, T. 19 N., R. 12 E.

Ap—0 to 4 inches, dark yellowish-brown (10YR 4/4) silty clay loam; moderate, fine, granular structure; friable; many fine roots; common fine concretions; very strongly acid; clear, smooth boundary.

B21t—4 to 8 inches, yellowish-red (5YR 4/8) silty clay; few to common, fine and medium, distinct, yellowish-brown (10YR 5/6) and grayish-brown (10YR 5/2) mottles; moderate, fine and medium, subangular blocky and angular blocky structure; firm, very plastic, very sticky; few fine roots and concretions; continuous clay films; very strongly acid; clear, wavy boundary.

B22t—8 to 16 inches, mottled yellowish-red (5YR 4/6) and light brownish-gray (2.5Y 6/2) clay; moderate, fine and medium, subangular blocky and angular blocky structure; firm, very plastic, very sticky; few fine roots; continuous clay films; very strongly acid; gradual, wavy boundary.

B23t—16 to 42 inches, mottled yellowish-brown (10YR 5/6) and light brownish-gray (2.5Y 6/2) clay; moderate, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; some slickensides that do not intersect; few fine roots and brown and black concretions; few fine shale fragments; patchy clay films on peds; very strongly acid; gradual, wavy boundary.

C—42 to 60 inches, grayish-brown (10YR 5/2) to brown (10YR 5/3) shaly clay; common to many, medium and coarse, light olive-brown (2.5Y 5/6) mottles; massive, platy shale fragments; firm; very strongly acid.

The Ap horizon is dominantly dark brown, brown, or dark yellowish brown. In a few undisturbed wooded areas there is an A1 horizon 1 to 3 inches thick and dark gray to very dark gray. The A horizon is typically silty clay loam but ranges to silt loam. The B21t horizon is dominantly yellowish red to brown and is mottled. In some soils the B21t horizon includes a 2 to 6 inch layer that is mottle free. The B22t and B23t horizons are mottled in shades of yellow, red, and gray or the matrix is reddish brown or strong brown and has few to many mottles in shades of gray. The Bt horizons are silty clay loam, silty clay, or clay and in clay content ranges from 35 to 58 percent. The Bt horizons range from 20 to 44 inches in thickness. The acid shale, or locally called "Porter's Creek" clay, ranges from a depth of 33 to 70 inches. Reaction ranges from strongly acid to extremely acid except in areas that have been limed.

The Wilcox soils occur with Falkner, Longview, Providence, Boswell, and Maben soils. The Wilcox soils are similar to the Falkner soils in drainage. The Falkner soils formed in a thin mantle of silty material over clay. Wilcox soils differ from Longview soils, in that the Longview soils are less clayey and have a fragipan. The Wilcox soils are less well drained than the Providence soils, which have heavy silt loam or silty clay loam B2t horizons with a fragipan. In texture, Wilcox soils are similar to the Boswell and Maben soils, but the Boswell and Maben soils lack gray mottles in the upper 10 inches of the B horizon.

Wilcox silt loam, 0 to 2 percent slopes (WcA).—This soil is on broad flats.

It has a dark-brown silt loam surface layer about 5 inches thick. The subsoil is mottled in shades of red, brown, and gray; is a silty clay or clay; and is underlain at depths ranging from 33 to 70 inches by acid shaly clay.

Included with this soil in mapping were small areas of Falkner, Longview, and Providence, heavy substratum, soils.

This soil is extremely acid to very strongly acid. Permeability is very slow. The available water capacity is high. The soil shrinks and cracks during dry periods. Runoff is slow, and if this soil is cultivated, seedbed preparation is often delayed because of wetness.

Most of this soil has remained in woodland. Minor areas are used for hay crops, soybeans, or small grain. This soil is well suited to pasture plants and pine trees. (Capability unit IIIw–4; woodland suitability group 3c2; wildlife suitability group 6)

Wilcox silty clay loam, 2 to 5 percent slopes, eroded (WlB2).—This soil is on ridges adjoining steeper side slopes.

Included with this soil in mapping were small areas of Falkner, Longview, and Providence silt loam, heavy substratum, and a few areas of a soil with a strong-brown silty clay loam subsoil, underlain at a depth of about 8 inches by mottled clay. Also included were a few areas that have a silt loam surface layer.

This soil is extremely acid to very strongly acid. Permeability is very slow. The available water capacity is high. This soil tends to shrink and crack during dry periods. Runoff is slow to medium, and if this soil is cultivated, erosion is light to moderate. Proper use of crop residue should be practiced to maintain soil tilth and reduce crusting and packing.

More than half of this soil is in hardwoods and pine trees. The rest is used for pasture and hay crops. This soil is suited to soybeans, small grain, pasture, and pine trees. (Capability unit IIIe–1; woodland suitability group 3c2; wildlife suitability group 6)

Wilcox silty clay loam, 5 to 8 percent slopes, eroded (WlC2).—This soil is on side slopes and a few ridgetops.

The surface layer is dark-brown silty clay loam about 4 inches thick. In some fields the subsoil is exposed, and in a few large areas the plow layer includes some of the upper part of the subsoil. A few small rills and deep gullies are in some fields. The subsoil is mottled in shades of brown, red, and gray; is silty clay or clay; and is underlain at a depth of 33 to 70 inches by gray, acid, shaly clay.

Included with this soil in mapping were small areas of Boswell soils and of Providence silt loam, heavy substratum, and a few areas of a soil similar to Providence in the upper part of the subsoil but lacking the fragipan and having mottled clay at a depth of about 18 inches.

This soil is extremely acid to very strongly acid. Permeability is very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. Runoff is medium, and if this soil is cultivated the erosion hazard is moderate. This soil needs a plant cover as much of the time as possible for the purpose of reducing erosion and maintaining soil tilth.

Approximately 75 percent of this soil is in woodland. The rest is mainly in pasture; only minor areas are used for row crops. This soil is suited to small grain, pasture, and pine trees. Because of slope and erosion, it is better for pasture and pine trees than for cultivated crops.

(Capability unit IVe-3; woodland suitability group 3c2; wildlife suitability group 6)

Wilcox silty clay loam, 8 to 12 percent slopes, eroded (WlD2).—This soil is on side slopes.

It has a dark-brown silty clay loam surface layer about 4 inches thick. A few small rills and deep gullies are in some areas. Where this soil is cultivated, the mottled subsoil in a few areas is exposed and the plow layer includes some of the upper part of the subsoil. The subsoil is mottled in shades of brown, red, and gray and is silty clay or clay. It is underlain at a depth of 33 to 70 inches by gray, acid, shaly clay.

Included with this soil in mapping, along the upper rims of a few areas, were small areas of Boswell soils and of Providence loam, heavy substratum. Also included were a few areas having common shallow gullies and a few deep gullies. In some areas the acid shale is less than 33 inches from the surface.

This soil is extremely acid to very strongly acid. Permeability is very slow. The available water capacity is high. The soil shrinks and cracks during dry periods. Runoff is rapid, and erosion is moderate.

Approximately 75 percent of this soil is used as woodland. Some of it has been cleared but is now in pine timber. The rest is idle or used for pasture. Because of slope and erosion, this soil is better suited to pasture and trees than to cultivated crops. (Capability unit VIe-3; woodland suitability group 3c2; wildlife suitability group 6)

Wilcox silty clay loam, 12 to 35 percent slopes, eroded (WlF2).——This soil is on side slopes.

The dark-brown silty clay loam surface layer is about 4 inches thick and has been rilled and thinned by erosion. In some areas, the short lateral drains, as well as the longer ones, have eroded down to the acid shale. The subsoil is mottled in shades of red, gray, and brown; is clay or silty clay; and is underlain by acid shaly clay.

Included with this soil in mapping were small areas of Boswell, Maben, and Ruston soils. These are some of the more elevated western areas of this soil. In a few areas the acid shale is within 2 feet of the surface.

This soil is extremely acid to very strongly acid. Permeability is very slow. The available water capacity is high. Runoff is rapid, and the erosion hazard is moderate to severe.

Most of this soil is in mixed hardwoods and pine trees. Because of slope, rapid runoff, and high erosion hazard, this soil is better suited to pine trees than other uses. (Capability unit VIIe-4; woodland suitability group 3c2; wildlife suitability group 6)

Use and Management of Soils

This section discusses the management of the soils of Oktibbeha County for tilled crops, tame pasture, woodland, wildlife, and engineering. The use of soils in town and country planning is also discussed.

The management of crops and pasture, of woodland for wood products, and for wildlife is discussed by groups of soils. Similar soils that are suitable for these purposes make up a group. To determine the soils in each of these groups, refer to the "Guide to Mapping Units."

Crops and Tame Pasture [2]

This subsection describes general practices of soil management, explains capability classification, and discusses management by capability groups of soils. Also, this subsection contains table 2, which gives estimated yields of important crops and pasture grasses under a high level of management.

General management practices help to maintain crop growth, to conserve moisture, and to control erosion. Some of the major practices are discussed in the following paragraphs.

Adequate amounts of fertilizer should be applied to cropland to provide necessary plant nutrients. Crop residues should be shredded after harvest and left on the surface, or if flooding occurs, they should be disked into the surface layer. The need for fertilizer varies for different soils and for different crops. Soil tests help to determine the correct amount and kind of fertilizer to add. Recommendations can also be obtained from the local Extension Service office and the Mississippi Agricultural Experiment Stations.

Some of the soils in the county have inadequate surface and internal drainage. They need drainage mains and laterals and surface field drains leading into them. Diversion dams and terraces are needed to protect the flood plains from excessive hill water. Contour cultivation, with terraces or contour strips, and grassed waterways are needed in the gently sloping fields to control erosion and conserve moisture.

Good, well managed sods of grasses and legumes protect the soil from erosion, provide forage and feed for livestock, and build up the organic-matter content of the soils. A wide variety of grasses and legumes grow well on the soils of Oktibbeha County. It is a good practice to obtain help from the local Soil Conservation office regarding the best suited plants or combination of plants for individual soils. The type of livestock enterprise and the individual needs of the farmer should also be considered. Perennial grasses that are widely adapted to the soils are common bermudagrass, Coastal bermudagrass, bahiagrass, dallisgrass and tall fescue. Legumes that are well adapted are white clover, wild winter peas, annual lespedeza, and sericea lespedeza.

Regular additions of fertilizer are profitable on pastures, and applications of lime are generally needed for most commonly grown crops. Those soils that are only slightly acid to moderately alkaline do not need additional lime. The amount, analysis, and frequency of application should be determined by a soil test.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible, but unlikely, major reclamation projects; and does not apply

[2] TRAVIS R. TAYLOR, agronomist, Soil Conservation Service, assisted in the preparation of this subsection.

to rice, cranberries, horticultural crops, or other crops requiring special management.

The capability classification reflects the behavior of soils when used for other purposes, but this classification is not a substitute for interpretation designed to show suitability and limitation of groups of soils for range, for forest trees, or for engineering.

In the capability system, all kinds of soils are grouped at three levels: the capability class, subclass, and unit. These are discussed in the following paragraphs.

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

- Class I soils have few limitations that restrict their use. (None in Oktibbeha County)
- 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, require special conservation practices, or both.
- Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
- Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover. (None in Oktibbeha County)
- Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.
- Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife food and cover.
- Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (None in Oktibbeha County)

Capability Subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless 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); *s* shows that the soil is limited because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife food and cover, or recreation.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-3 or IIIe-4. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

In the following pages the capability units in Oktibbeha County are described and suggestions for the use and management of the soils are given.

CAPABILITY UNIT IIe-1

This capability unit consists of moderately well drained, strongly acid and very strongly acid soils on uplands and terraces and soils that have a fragipan at a depth of about 18 to 28 inches. These soils are in the Prentiss and Savannah series. They have a friable silt loam and fine sandy loam surface layer and a loam and silt loam subsoil. Permeability is moderate in the subsoil and moderately slow in the fragipan. Root penetration is retarded in the fragipan. The available water capacity is medium. These soils can be worked easily, but they crust and pack when left idle. Plowpans tend to form if the depth of plowing is not varied.

With a high level of management, these soils are suited to cotton, corn, soybeans, grain sorghum, small grain, wild winter peas, annual lespedeza, sericea lespedeza, crimson clover, vetch, white clover, dallisgrass, Coastal and common bermudagrass, bahiagrass, sudangrass and tall fescue.

Applications of a complete fertilizer and lime are needed for all crops and permanent pasture, and additional nitrogen is needed for all nonlegumes.

Where these soils are cultivated, the erosion hazard is slight to moderate. If erosion is adequately controlled, these soils can be tilled continuously. The use of a cropping system, of water control measures such as grassed waterways to slow down runoff, and tillage on the contour are all effective in controlling erosion. A cropping sequence that includes close-growing crops and proper use of crop residues are also helpful in controlling erosion, in maintaining organic-matter content, and in improving infiltration rate. On the longer slopes, terraces or contour strips aid in controlling soil loss.

CAPABILITY UNIT IIe-2

The only soil in this capability unit is Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded. It is a moderately well drained, strongly acid or very strongly acid soil on uplands. It has a fragipan at a depth ranging from 16 to 27 inches. This soil has a friable silt loam surface layer and a silty clay loam subsoil. It has a fragipan that is underlain by a clayey layer at a depth of 30 to 48 inches.

This soil can be worked easily, but it crusts and packs when left idle, and a plowpan can form if the depth of plowing is not varied. Permeability is moderate above the fragipan and moderately slow in the fragipan and clayey layer. Root pentration is retarded in the fragipan. The available water capacity is medium.

With a high level of management, this soil is suited to cotton, corn, soybeans, grain sorghum, small grain, wild winter peas, annual lespedeza, sericea lespedeza, dallisgrass, crimson clover, vetch, white clover, Coastal and common bermudagrass, bahiagrass, sudangrass, and tall fescue.

Applications of a complete fertilizer and lime are needed for crops and permanent pasture, and additional nitrogen is needed for all nonlegumes.

Where this soil has been cultivated, the erosion hazard is moderate. If erosion is adequately controlled, this soil can be tilled continuously. Effective measures for erosion control are selected cropping systems, contour tillage, parallel terraces, contour stripcropping, and grassed waterways. Proper use of close-growing crops in the cropping sequence and use of crop residue also help to control erosion, to maintain organic-matter content, and to improve infiltration rates.

CAPABILITY UNIT IIe-3

The only soil in this capability unit is Ruston fine sandy loam, 2 to 5 percent slopes. It is a well-drained, medium acid to very strongly acid soil on uplands. It has a very friable fine sandy loam surface layer and a sandy clay loam subsoil that is underlain by loam and sandy loam. Permeability is moderate, and the available water capacity is medium. This soil can be worked easily, but it crusts and packs when left bare.

With a high level of management, this soil is suited to cotton, corn, soybeans, truck crops, small grain, grain sorghum, wild winter peas, annual lespedeza, sericea lespedeza, crimson clover, vetch, white clover, Coastal and common bermudagrass, bahiagrass, sudangrass, tall fescue, apples, pears, and pecans.

Applications of a complete fertilizer and lime are needed for all crops and permanent pasture, and additional nitrogen is needed for all nonlegumes.

Runoff is medium and erosion hazard is slight to moderate where this soil is cultivated. This soil can be tilled continuously if contour tillage, selected cropping systems, and water-control measures such as grassed waterways are used to control runoff and erosion. A good cropping system is one that includes close-growing crops about half of the time and row crops half of the time. Crop residues that are shredded and left on the surface help to control erosion and to increase infiltration rate. On the longer slopes, parallel terraces or contour strips help to control the loss of the soil.

CAPABILITY UNIT IIw-1

This capability unit consists of somewhat poorly drained, very strongly acid to moderately alkaline soils of the Brooksville and Kipling series. These soils have a silty clay to silty clay loam surface layer that is underlain by silty clay or clay. The slope ranges from 0 to 2 percent.

Permeability is slow to very slow, and the available water capacity is high. The soils shrink and crack during dry periods. They can be worked fairly easily but can be tilled only within a narrow range of moisture content.

Under a high level of management, these soils are suited to cotton, corn, soybeans, small grain, sericea lespedeza, black medic, wild winter peas, white clover, Coastal and common bermudagrass, johnsongrass, dallisgrass, and tall fescue.

Applications of fertilizer are needed for most row crops and pasture plants, and additional nitrogen is needed for all nonlegumes. Lime is needed on the acid soils for most plants. Organic-matter content can be maintained by including in the cropping sequence crops that leave a large amount of residue, and then by effectively using the crop residue. Soil tilth can be improved by preparing seedbeds in the fall and allowing the soil to weather and settle before planting.

In some years spring planting must be delayed because the soil is slow to dry out. Surface water can be removed by well arranged rows and field ditches.

CAPABILITY UNIT IIw-2

This capability unit consists of moderately well drained to somewhat poorly drained, medium acid to moderately alkaline alluvial soils that have 0 to 2 percent slopes. These soils are in the Catalpa and Leeper series. They have a silty clay loam surface layer and a silty clay or clay subsoil. Permeability is slow, and the available water capacity is high. This soil shrinks and cracks during dry periods.

With a high level of management, these soils are suited to crops and pasture plants commonly grown in the area (fig. 4). They are well suited to cotton, corn, soybeans, grain sorghum, small grain, Coastal and common bermudagrass, tall fescue, dallisgrass, johnsongrass, wild winter peas, alfalfa, annual lespedeza, white clover, sweetclover, black medic, and adapted hardwoods.

Applications of fertilizer are generally needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave a large amount of residue, and then by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

This soil can be tilled continuously if adequately drained and if proper use is made of the crop residue. The soil can be worked fairly easily, except in areas where flooding and scouring are severe. Seedbeds should be prepared in the fall so that the soil can weather and settle before planting.

Planting is sometimes delayed in the spring because of wetness. Excess surface water can be removed by using surface field ditches and properly arranging crop rows. Diversion terraces are needed in some areas to divert water from adjacent hillsides.

CAPABILITY UNIT IIw-3

The only soil in this capability unit is Freestone fine sandy loam, 0 to 2 percent slopes. It is a moderately well drained to somewhat poorly drained, strongly acid to very strongly acid soil on uplands. It has a friable fine sandy loam surface layer. The upper part of the

Figure 4.—**A vegetated waterway on Leeper silty clay loam.**

subsoil is a friable loam that is underlain at a depth of about 15 to 28 inches by clay loam. Permeability is moderately slow in the upper part of the subsoil but slow in the clay loam layer. The available water capacity is medium. The soil is easily worked, but it crusts and packs if left bare, and a plowpan can form if the depth of plowing is not varied.

With a high level of management, this soil is suited to cotton, corn, soybeans, small grain, Coastal bermudagrass, dallisgrass, bahiagrass, tall fescue, common bermudagrass, annual lespedeza, sericea lespedeza, and white clover.

Applications of a complete fertilizer and lime are needed for most crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave a large amount of crop residue and then by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

This soil can be tilled continuously where adequate drainage and a good cropping system are used.

Because this soil is nearly level and the permeability is slow, seedbed preparation and cultivation are delayed during wet periods. Excess surface water can be removed by using well arranged rows and surface field ditches.

CAPABILITY UNIT IIw-4

This capability unit consists of somewhat poorly drained, strongly acid to very strongly acid alluvial soils. These soils are in the Mantachie and Mathiston series. They have a friable silt loam and loam surface layer that is underlain by a loam and silt loam subsoil. Permeability is moderate. Root pentration is retarded by a seasonally high water table. The available water capacity is medium to very high. These soils can be worked easily but will crust and pack when left idle.

With a high level of management, these soils are suited to cotton, corn, soybeans, small grains, common and Coastal bermudagrass, dallisgrass, bahiagrass, tall fescue, wild winter peas, annual lespedeza, and white clover.

Applications of a complete fertilizer and lime are needed for many crops and for permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave a large amount of crop residue and then by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

Flooding is a moderately severe hazard, and in some areas sedimentation and scouring occur. Surface drainage is needed in the low-lying areas. Excess water on these soils can be removed by using surface field ditches and properly arranging rows. Soil leveling is needed in some areas. These soils can be tilled continuously if adequately drained.

CAPABILITY UNIT IIw-5

The only soil in this capability unit is Marietta fine sandy loam. It is a moderately well drained, medium acid to moderately alkaline alluvial soil. It has a friable fine sandy loam surface layer and a loam or sandy clay loam subsoil. Permeability is moderately slow. The available water capacity is high.

With a high level of management, this soil is suited to cotton, corn, soybeans, grain sorghum, small grain, common and Coastal bermudagrass, tall fescue, dallisgrass, johnsongrass, wild winter peas, alfalfa, annual lespedeza, white clover, and sweetclover.

Applications of fertilizer are generally needed for all row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained by growing crops that leave a large amount of residue and by properly managing the crop residue. The crop residue should be shredded and left on the surface as a mulch where this soil is not cultivated.

This soil can be tilled continuously if drainage is adequate and crop residue is well managed.

This soil is easily worked, but can crust and pack if left bare. It can be worked throughout a fairly wide range of moisture content. It is subject to moderate crop damage from flooding.

Planting is sometimes delayed in the spring because of wetness. Excess surface water can be removed by using surface field ditches and by properly arranging crop rows. Diversion terraces are needed in some areas to divert the water from adjacent hillsides.

CAPABILITY UNIT IIw-6

The only soil in this capability unit is Ochlockonee loam. It is a well-drained, strongly acid to very strongly acid alluvial soil. It has a friable loam surface layer underlain by sandy loam. Permeability is moderate. The available water capacity is medium.

With a high level of management, this soil is suited to cotton, corn, soybeans, small grain, common and Coastal bermudagrass, tall fescue, dallisgrass, bahiagrass, sudangrass, wild winter peas, vetch, annual lespedeza, and white clover.

Applications of complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained by growing crops that leave a large amount of residue and then by effectively using the crop residue. The crop residue should be shredded and left on the surface, unless this soil is not in cultivation.

This soil can be tilled continuously if drainage is adequate and management of crop residue is good.

This soil is easily worked, but it crusts and packs when left bare. A plowpan forms if depth of plowing is not varied. The soil can be worked throughout a wide range of moisture content. It is subject to moderately severe crop damage from flooding.

Excess surface water can be removed by surface field ditches and proper arrangement of crop rows. Land leveling is needed in some areas.

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CAPABILITY UNIT IIw-7

The only soil in this capability unit is Prentiss silt loam, 0 to 2 percent slopes. It is moderately well drained, strongly acid to very strongly acid soil on uplands and terraces. It has a friable silt loam surface layer; the subsoil is a silt loam with a fragipan at a depth of about 19 to 26 inches. Permeability is moderate in the upper part of the subsoil but moderately slow in the fragipan. Root penetration is retarded in the fragipan. The available water capacity is medium. This soil is easily worked, but it crusts and packs when left bare, and a plowpan may form if depth of plowing is not varied.

With a high level of management, this soil is suited to cotton, corn, small grain, wild winter peas, annual lespedeza, sericea lespedeza, crimson clover, white clover, vetch, Coastal and common bermudagrass, bahiagrass sudangrass, dallisgrass, and tall fescue.

Applications of a complete fertilizer and lime are needed for most crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave a large amount of residue, and then, by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

This soil can be tilled continuously if drainage is adequate and management of crop residue is good.

Because this soil is nearly level, surface water is a slight hazard during wet periods, and seedbed preparation is sometime delayed in spring. Generally, excess surface water can be removed by well-arranged crop rows and surface field ditches.

CAPABILITY UNIT IIw-8

The only soil in this capability unit is Urbo silty clay loam. It is a somewhat poorly drained, strongly acid to very strongly acid alluvial soil (fig. 5). It has a friable silty clay loam surface layer and a subsoil of silty clay or clay. Permeability is very slow, and root penetration is restricted by a seasonally high water table. The available water capacity is high.

Figure 5.—**Water ponded on Urbo silty clay loam reflects the need for surface drainage or land leveling.**

With a high level of management, this soil is suited to corn, soybeans, grain sorghum, common and Coastal bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, annual lespedeza, and white clover.

Applications of complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that have a large amount of residue, and then by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

This soil can be tilled continuously if drainage is adequate and management of crop residue is good.

This soil is fairly easily worked, but it crusts and packs if left bare. It can be worked within a narrow range of moisture content.

Flooding is a moderately severe hazard. Surface drainage is needed in the low-lying areas. Excess water that stands on this soil can be removed by surface field ditches and by proper arrangement of rows. Land leveling is needed in some areas.

CAPABILITY UNIT IIs-1

The only soil in this capability unit is Houston silty clay. It is a moderately well drained, neutral to moderately alkaline soil on prairie uplands. It has a silty clay surface layer underlain by silty clay and clay. Permeability is very slow. The available water capacity is high. The soil shrinks and cracks during dry periods. It works fairly easily but can be tilled only within a narrow range of moisture content.

With a high level of management, this soil is suited to cotton, corn, soybeans, small grain, common and Coastal bermudagrass, tall fescue, dallisgrass, johnsongrass, wild winter peas, alfalfa, black medic, sweetclover, and white clover.

Applications of fertilizer and lime are needed for most crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave a large amount of residue, and then by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch. This soil can be tilled continuously if use of crop residue is good.

Except in areas susceptible to erosion, soil tilth can be improved by preparing seedbeds in the fall and allowing the soil to weather and settle before planting.

Planting and cultivation are delayed during wet periods because the soil is nearly level and dries slowly. Surface water can be removed by well-arranged crop rows.

CAPABILITY UNIT IIIe-1

This unit consists of somewhat poorly drained to well-drained, slightly acid to extremely acid soils on uplands. These soils are in the Boswell, Freestone, Maben, and Wilcox series. They have a fine sandy loam or silty clay loam surface layer and a subsoil of clay loam or clay.

Erosion is slight to moderate. Permeability is moderately slow to very slow. The available water capacity is medium to high. These soils, except the Maben, shrink and crack during dry periods. They are easily worked except in areas where the subsoil is exposed. They crust and pack if left bare. The Wilcox soil tends to clod if tilled when wet.

If a high level of management is used, the soils of this unit are suited to corn, cotton, soybeans, small grain, common and Coastal bermudagrass, dallisgrass, bahiagrass, tall fescue, sudangrass, annual lespedeza, sericea lespedeza, white clover, and pine trees.

Applications of a complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes.

Because of slope, runoff is medium and the erosion hazard is moderate if this soil is cultivated. Erosion can be controlled by using a cropping system and water-control measures such as contour tillage, contour stripcropping, and parallel terraces. Crop residue left on the surface helps to control erosion, increase infiltration, and maintain organic-matter content.

CAPABILITY UNIT IIIe-2

The only soil in this capability unit is Savannah fine sandy loam, 5 to 8 percent slopes, eroded. It is a moderately well drained, strongly acid to very strongly acid soil on uplands. It has a fine sandy loam surface layer, and the subsoil is loam that has a fragipan at a depth of about 22 inches.

Permeability is moderate in the subsoil and moderately slow in the fragipan. Root penetration is retarded in the fragipan. The available water capacity is medium. This soil can be worked easily, but it crusts and packs if left bare. A plowpan tends to form if depth of plowing is not varied.

If a high level of management is used, the soil is suited to cotton, corn, soybeans, grain sorghum, small grain, wild winter peas, annual lespedeza, sericea lespedeza, crimson clover, vetch, white clover, dallisgrass, Coastal and common bermudagrass, bahiagrass, sudangrass, tall fescue.

If this soil is cultivated, the erosion hazard is moderate, but erosion can be controlled by using a cropping system and water-control measures such as grassed waterways, contour tillage, parallel terraces, or stripcropping. If this soil is protected by such measures, close-growing crops should be grown about 4 years and clean-tilled row crops about 2 years. Roads should be located on dividing ridges or parallel to terraces.

Applications of a complete fertilizer and lime are needed for most crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Crop residue left on the surface helps to control erosion, increase infiltration, and maintain organic-matter content.

CAPABILITY UNIT IIIe-3

This capability unit consists of moderately well drained and somewhat poorly drained, acid to alkaline soils of the uplands. Slopes range from 2 to 5 percent. These soils are in the Brooksville, Kipling, and Oktibbeha series. They have a silty clay loam and silty clay surface layer underlain by silty clay or clay.

Erosion is slight to moderate. Permeability is slow to very slow. The available water capacity is high. These soils shrink and crack during dry periods. They are fairly easy to work but can be tilled only within a narrow range of moisture content.

If a high level of management is used, these soils are suited to cotton, corn, soybeans, grain sorghum, small grain, common and Coastal bermudagrass, dallisgrass, tall fescue, johnsongrass, bahiagrass, wild winter peas, vetch, annual lespedeza, and sericea lespedeza.

Erosion is a slight to moderate hazard, but it can be controlled by using such water-control measures as contour tillage, grassed waterways, and terraces or stripcropping. If these soils are protected by such measures, a suitable cropping system is one that leaves a large amount of crop residue.

Applications of a complete fertilizer are needed for production of most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Lime is needed for most plants. Crop residue left on the surface helps to control erosion, to increase infiltration, and to maintain organic-matter content. Planting is sometimes delayed in spring because these soils dry out slowly.

CAPABILITY UNIT IIIe-4

The only soil in this capability unit is Providence silt loam, heavy substratum, 5 to 8 percent slopes, eroded. This upland soil is moderately well drained and very strongly acid to strongly acid. It has a silt loam surface layer. The subsoil is silty clay loam that has a fragipan at a depth of 16 to 27 inches. The fragipan is underlain by a clayey layer at a depth of 30 to 48 inches.

Permeability is moderate above the fragipan and moderately slow in the fragipan and clayey layer. The available water capacity is medium. Root penetration is retarded in the fragipan. This soil can be worked easily, but it crusts and packs if left bare, and a plowpan may form if depth of plowing is not varied.

Under a high level of management, this soil is suited to cotton, corn, soybeans, grain sorghum, small grain, annual lespedeza, sericea lespedeza, crimson clover, vetch, white clover, Coastal and common bermudagrass, dallisgrass, bahiagrass, sudangrass, and tall fescue.

If this soil is cultivated, the erosion hazard is moderate but can be controlled by using a cropping system and water-control measures such as contour tillage, grassed waterways, and terraces or stripcropping. If this soil is protected by such measures, clean-tilled row crops can be grown about half of the time and close-growing crops about half of the time.

Application of a complete fertilizer and lime is needed for most crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Crop residue left on the surface helps to control erosion, to increase infiltration, and to maintain organic-matter content.

CAPABILITY UNIT IIIw-1

The only soil in this capability unit is Adaton silt loam. It is a poorly drained, strongly acid to very strongly acid soil on uplands. Slopes range from 0 to 2 percent. The surface layer is silt loam, and the subsoil is silty clay loam.

Permeability is moderately slow to slow, and root penetration is restricted by seasonal high water table. The soil is waterlogged during wet periods, particularly in winter and early in spring. The available water capacity is very high.

If a high level of management is used, this soil is suited to common bermudagrass, tall fescue, bahiagrass, dallisgrass, white clover, annual lespedeza, oats, and soybeans.

Applications of a complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave a large amount of residue, and then by effectively using the crop residue.

This soil has fairly good tilth but crusts and packs if left bare. Proper arrangement of rows and surface field ditches helps to remove excess surface water.

CAPABILITY UNIT IIIw-2

This capability unit consists of somewhat poorly drained, strongly acid to very strongly acid upland soils. These soils are in the Falkner and Longview series. Slopes range from 0 to 5 percent. They have a silt surface layer, and the subsoil is silt loam or silty clay loam that has a fragipan or clay layer at a depth of 15 to 30 inches.

Erosion is slight to none. Permeability is moderate in the upper subsoil above the fragipan and clay layer, but slow within these layers. These soils have a perched water table because of the fragipan and clay layers. The available water capacity is medium to high. These soils are easily worked, but they crust and pack when left idle, and a plowpan forms readily if depth of plowing is not varied.

Under a high level of management, these soils are suited to cotton, corn, soybeans, grain sorghum, small grains, Coastal and common bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, vetch, annual lespedeza, and white clover.

Applications of a complete fertilizer and lime are needed for most crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave a large amount of residue and by effectively managing the crop residue. The crop residue should be shredded and left on the surface as a mulch.

Erosion can be effectively controlled, and the soils can be used continuously, if they are adequately drained and well managed.

Because of the fragipan or clay layer and slope, these soils are waterlogged during wet periods, particularly in winter and late in spring. Excess surface water is a problem. Seedbed preparation and planting are often delayed in spring because of wetness. Generally, excess surface water can be removed by surface field ditches and proper arrangement of crop rows.

CAPABILITY UNIT IIIw-3

The only soil in this capability unit is Stough fine sandy loam. It is a somewhat poorly drained, strongly acid to very strongly acid soil on uplands and terraces. Slopes range from 0 to 2 percent. The surface layer is fine sandy loam, and the subsoil is loam with a fragipan at a depth of about 18 inches.

Erosion is slight. Permeability is moderate above the fragipan and moderately slow within it. Water and root penetration are restricted in the fragipan. The available water capacity is medium. This soil is easily worked but tends to crust and pack when left bare.

With a high level of management, this soil is suited to cotton, corn, soybeans, small grain, common and Coastal bermudagrass, tall fescue, dallisgrass, bahiagrass, sudangrass, vetch, annual lespedeza, and white clover.

Applications of a complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave large amounts of residue, and by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

With adequate drainage and proper use of crop residue, suggested cropping systems are (1) continuous row crops and good use of crop residue, or (2) close-growing crops for 3 years and row crops for 2 years. Another system is that of keeping perennial vegetation on the soil most of the time.

Because of the fragipan, this soil is waterlogged in winter and early in spring. Seedbed preparation and planting are often delayed in spring by wetness. Excess surface water generally can be removed by using surface field ditches and proper arrangement of crop rows.

CAPABILITY UNIT IIIw-4

The only soil in this capability unit is Wilcox silt loam, 0 to 2 percent slopes. It is a somewhat poorly drained, extremely acid to strongly acid soil on uplands. The surface layer is silt loam, and the subsoil is silty clay or clay.

Erosion is slight to none, and permeability is very slow. The available water capacity is high. The soil shrinks and cracks during dry periods. The soil works fairly easily, but it can be cultivated only within a narrow range of moisture content. Also, it crusts and packs if left bare.

Under a good level of management, pasture can be produced on this soil. It is poorly suited to most of the commonly grown row crops in the area. Coastal and common bermudagrass, bahiagrass, tall fescue, dallisgrass, sudangrass, white clover, and sericea lespedeza are suited to this soil.

Applications of a complete fertilizer and lime are needed for most commonly grown row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes.

If this soil is cultivated, organic-matter content can be maintained and infiltration improved by growing crops that leave a large amount of residue and by effectively using the residue. The crop residue should be shredded and left on the surface as a mulch.

Excess surface water can generally be removed with surface field ditches and proper arrangement of crop rows.

CAPABILITY UNIT IVe-1

The only soil in this capability unit is Savannah fine sandy loam, 8 to 12 percent slopes, eroded. It is a moderately well drained, strongly acid to very strongly acid upland soil. It has a fine sandy loam surface layer, and the subsoil is a clay loam with a fragipan at a depth of 19 inches.

Erosion is moderate. Permeability is moderate in the subsoil and moderately slow in the fragipan. Root penetration is retarded in the fragipan. The available water capacity is medium. This soil can be worked easily, but it crusts and packs if left bare. A plowpan tends to form if depth of plowing is not varied.

Under a high level of management, this soil is suited to grain sorghum, small grain, Coastal and common bermudagrass, tall fescue, bahiagrass, sudangrass, wild winter peas, vetch, annual lespedeza, sericea lespedeza, and white clover.

Because of slope, rapid runoff, and severe erosion hazard, this soil is particularly suited to permanent vegetation. If erosion control is adequate, a suggested cropping system is 6 years of sod crops and 2 years row crops. Tillage on the contour, terraces, and grassed waterways are helpful in controlling erosion. Field roads should be located on the dividing ridges or parallel to the terraces. Without such practices for control of erosion, this soil should be kept in perennial vegetation.

Applications of a complete fertilizer and lime are needed for all crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Crop residue shredded and left on the surface is helpful in controlling erosion, improving infiltration, and maintaining organic-matter content.

CAPABILITY UNIT IVe-2

This capability unit consists of moderately well drained and somewhat poorly drained, strongly acid to very strongly acid soils. Slopes range from 5 to 8 percent. These soils are in the Kipling and Oktibbeha series. They have a silty clay loam surface layer, and the subsoil is silty clay or clay. Permeability is slow to very slow. The available water capacity is high. Most of these soils shrink and crack during dry periods. They are fairly easy to work, but can be tilled only within a narrow range of moisture content.

Under a high level of management, these soils are suited to soybeans, grain sorghum, small grain, tall fescue, Coastal and common bermudagrass, dallisgrass, johnsongrass, bahiagrass, wild winter peas, vetch, and annual and sericea lespedeza.

Applications of a complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes.

If this soil is cultivated, the slope causes medium runoff and the erosion hazard is moderate to severe. Terraces, stripcropping, grassed waterways, and contour tillage reduce runoff and help to control erosion. Even when protected by such measures, these soils are better suited to perennial vegetation. A suggested cropping system is 6 years of sod and 2 years of row crops. Without this protection, perennial vegetation should be grown continuously. Crop residue left on the surface is helpful in maintaining organic-matter content, reducing erosion, and increasing infiltration rates. Roads should be located on dividing ridges or parallel to the terraces.

CAPABILITY UNIT IVe-3

This capability unit consists of somewhat poorly drained and well drained, extremely acid to strongly acid soils on uplands. These soils are in the Maben and

Wilcox series. They have a fine sandy loam, clay loam, or friable silty clay loam surface layer, and the subsoil is clay loam to clay.

Erosion is slight to moderate. Permeability is moderately slow to very slow. The available water capacity is medium to high. Wilcox soils shrink and crack during dry periods, and they tend to clod when wet. Maben soils work easily, except in areas where the subsoil is exposed. Where subsoil is at the surface, they crust and pack when left bare.

Under a high level of management, these soils are suited to small grain, common and Coastal bermudagrass, bahiagrass, sudangrass, tall fescue, annual and sericea lespedeza, and white clover.

Applications of a complete fertilizer and lime are needed for most crops and permanent pasture, and additional nitrogen is needed for all nonlegumes.

Because of slope, runoff is moderate to rapid, and the erosion hazard is moderate to severe. Terraces, stripcropping, grassed waterways, and contour tillage reduce runoff and help to control erosion. Even if protected by such measures, this soil should be kept in perennial vegetation most of the time. A suggested cropping system is sod for 6 years and row crops for 2 years. Perennial vegetation should be continuously grown if the soils are not protected by terracing, stripcropping, or similar practices for control of erosion.

CAPABILITY UNIT IVe-4

The only soil in this capability unit is Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded. It is a moderately well drained, very strongly acid to strongly acid upland soil. It has a silt loam surface layer. The subsoil is silty clay loam or silt loam with a fragipan at a depth of about 16 to 27 inches. The fragipan is underlain by a clayey layer at a depth of about 30 to 48 inches.

Permeability is moderate above the fragipan and moderately slow in the fragipan and clayey layer. Root penetration is retarded in the fragipan. The available water capacity is medium. The soil is easily worked but crusts and packs if left bare, and a plowpan may form if depth of plowing is not varied.

Under a high level of management, this soil is well suited to cotton, corn, grain sorghum, small grains, Coastal and common bermudagrass, johnsongrass, bahiagrass, tall fescue, wild winter peas, annual lespedeza and sericea lespedeza, crimson clover, white clover, sudangrass, pine trees, and adapted hardwoods.

If this soil is cultivated, the erosion hazard is severe, but it can be reduced by using a cropping system and water-control measures such as contour tillage, terraces, and grassed waterways. If this soil is protected by such measures, a suggested cropping system is 6 years of sod followed by 2 years of row crops. If this soil is not protected by such measures, it should be in perennial vegetation continuously. Field roads should be located on dividing ridges or parallel to the terraces.

Applications of a complete fertilizer and lime are needed for most crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Crops residue shredded and left on the surface helps control erosion, increase infiltration, and maintain organic-matter content.

CAPABILITY UNIT IVe-5

This capability unit consists dominantly of well drained, mildly alkaline to moderately alkaline soils of the prairie uplands. Slopes range from 2 to 8 percent. These soils are in the Binnsville and Sumter series. They have a friable silty clay loam surface layer, which overlies silty clay or marly clay. Chalk is at a depth of about 10 to 30 inches.

Erosion is moderate. Permeability is slow. These soils have a low to medium available water capacity. They work fairly easily, but only within a narrow range of moisture content.

Under a good level of management, these soils are suited to small grains, common bermudagrass, King Ranch bluestem, tall fescue, johnsongrass, dallisgrass, wild winter peas, vetch, white clover, sweetclover, and black medic.

Applications of fertilizer are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration can be improved by growing crops that leave large amounts of residue, and by effectively using the residue. A cover is needed on the surface of the soils as much of the time as possible for the purpose of reducing the erosion hazard. A suggested cropping system is 4 years sod crops and 2 years of small grain. Another system is continuous sod crops.

Diversions may be needed in some areas to manage water and protect these soils from further erosion. Tillage on the contour and grassed waterways are effective in controlling erosion.

CAPABILITY UNIT IVw-1

The only soil in this capability unit is Myatt loam. It is a poorly drained, strongly acid to very strongly acid soil on uplands and terraces. It has a loam surface layer, and the subsoil is silt loam or loam. Slopes range from 0 to 2 percent.

Erosion is slight to none. Infiltration and permeability are moderately slow. The available water capacity is medium to high. Root penetration is retarded because of a seasonally high water table. This soil crusts and packs if left bare.

At a high level of management, this soil is suited to common bermudagrass, tall fescue, dallisgrass, wild winter peas, and white clover.

Applications of a complete fertilizer and lime are needed for row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave large amounts of residue, and by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

The seasonally high water table at or near the surface is a problem. Drainage can be hastened by surface field ditches, drainage mains and laterals, and graded rows.

CAPABILITY UNIT IVw-2

The only soil in this capability unit is Sessum silty clay loam. It is a poorly drained, acid upland soil that becomes moderately alkaline at a depth of about 40 to 96 inches. It has a silty clay loam surface layer, and the subsoil is clay. Slopes range from 0 to 2 percent.

Erosion is slight to none. Permeability is very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. It is difficult to work and can be tilled only within a narrow range of moisture content.

This soil is not suited to many crops, but with good management soybeans, small grains, Coastal and common bermudagrass, tall fescue, bahiagrass, dallisgrass, johnsongrass, wild winter peas, lespedeza, and white clover can be grown.

Applications of a complete fertilizer and lime are needed for row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content should be maintained and infiltration improved by growing crops that leave a large amount of residue, and by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

With adequate drainage and good management of crop residue, this soil can be used continuously for clean-tilled crops. Without these practices, continuous perennial vegetation is suggested for this soil.

Because this soil is nearly level and dries slowly, seedbed preparation and planting are often delayed in spring. Surface field ditches, drainage mains and laterals, and proper row arrangement are helpful in removing excess surface water.

CAPABILITY UNIT VIe-1

In this capability unit is Oktibbeha soils, 8 to 17 percent slopes, severely eroded. These are moderately well drained, strongly acid to very strongly acid soils on uplands. Because of severe erosion, their clay or silty clay subsoil is at or near the surface.

Permeability is slow to very slow. The available water capacity is high to medium.

Because of slope, rapid runoff, and severe erosion hazard, these soils are used for bermudagrass, bahiagrass, annual lespedeza, sericea lespedeza, and white clover.

They should be kept in permanent vegetation to control further erosion, increase infiltration, and decrease runoff.

Applications of a complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. The pasture should not be overgrazed.

CAPABILITY UNIT VIe-2

This capability unit consists dominantly of well-drained, mildly alkaline to moderately alkaline soils of the uplands. These soils overlie chalk at depths ranging from about 7 to 50 inches. They are soils of the Binnsville and Sumter series. They have a silty clay loam surface layer. Erosion is moderate. Permeability is slow in the subsoil. The available water capacity is low to medium.

These soils need a permanent cover of vegetation to protect them from further erosion, increase the infiltration rate, and decrease runoff.

At a high level of management, these soils are suited to bermudagrass, tall fescue, dallisgrass, King Ranch bluestem, johnsongrass, wild winter peas, vetch, white clover, sweetclover, and black medic.

Applications of fertilizer are needed for pasture plants, and additional nitrogen is needed for all nonlegumes. The pastures should not be overgrazed. Diversion ditches may be needed in some places to protect these soils from further erosion.

CAPABILITY UNIT VIe-3

The only soil in this capability unit is Wilcox silty clay loam, 8 to 12 percent slopes, eroded. It is a somewhat poorly drained, extremely acid to strongly acid soil on uplands. It has a silty clay loam surface layer, and the subsoil is a silty clay or clay.

Erosion is moderate, and permeability is very slow. The available water capacity is high. This soil shrinks and cracks during dry periods.

Because of slope and erosion hazard, this soil is suitable mainly for pasture. Coastal and common bermudagrass, bahiagrass, tall fescue, sudangrass, annual lespedeza, sericea lespedeza, and white clover are appropriate pasture plants.

This soil should be kept in permanent vegetation so that erosion is controlled. Applications of fertilizer and lime are needed for pasture plants, and additional nitrogen is needed for all nonlegumes. The pastures should not be overgrazed.

CAPABILITY UNIT VIIe-1

This capability unit consists of Gullied land-Sumter complex, 5 to 20 percent slopes. Most of the areas are so severely gullied that soil profiles have been destroyed and only isolated spots and fingerlike extensions of the original soils remain between the gullies. The rest of the identifiable profiles are mainly those of Sumter soils. The underlying material is chiefly mildly to moderately alkaline clay, or firm chalk.

Permeability is slow. The available water capacity is medium to low.

Because of the rapid runoff and very severe erosion hazard, this unit should be kept in permanent vegetation. Perennial pasture plants or cedar trees are suitable for areas where the gullied land is alkaline clay, and pasture or pine trees where the clay is acid.

CAPABILITY UNIT VIIe-2

This capability unit consists of Kipling and Sumter soils, 17 to 40 percent slopes, severely eroded. These soils are intermingled, but not in a regular pattern. They are very strongly acid to moderately alkaline soils on uplands. They have a silty clay loam surface layer, and their subsoil is silty clay or clay.

The hazard of erosion is severe. Permeability is slow to very slow. The available water capacity is medium.

Because of slope, rapid runoff, and severe erosion hazard, these soils should be kept in permanent vegetation. Most of the commonly grown pasture plants are suitable.

Applications of fertilizer are needed for pasture plants, and additional nitrogen is needed for all nonlegumes. The pastures should not be overgrazed.

CAPABILITY UNIT VIIe-3

This capability unit consists of well-drained, slightly acid to very strongly acid upland soils. Slopes range from 12 to 30 percent. These soils are in the Maben and Ruston series. They have a fine sandy loam surface layer, and their subsoil ranges from sandy clay loam to clay.

Erosion is slight to moderate. Permeability is moderate to moderately slow. The available water capacity is medium to high.

Because of slope, rapid runoff, and the erosion hazard, this soil is better suited to permanent vegetation such as trees.

CAPABILITY UNIT VIIe-4

The only soil in this capability unit is Wilcox silty clay loam, 12 to 35 percent slopes, eroded. It is a somewhat poorly drained, extremely acid to very strongly acid soil on uplands. It has a surface layer of silty clay loam and a subsoil of silty clay or clay.

Erosion is moderate. Permeability is very slow. The available water capacity is high. This soil shrinks and cracks during dry periods.

This soil should be kept in trees or other permanent vegetation that can help in controlling erosion and reducing runoff.

Estimated yields

Estimated average yields per acre of the principal crops on most of the soils in Oktibbeha County under a high level of management are shown in table 2.

The estimates are based on yields obtained in long-term experiments; on observations made during the survey; and on information from agricultural workers who are familiar with the soils in the county. Data for yields obtained on experimental plots were adjusted to reflect the combined effect of slope, weather, and levels of management. If such data were not available, estimates were made by using available data for similar soils.

The following management practices are needed to obtain the yields listed in table 2: (1) application of lime and fertilizer in amounts indicated by soil tests and field trials (lime is not needed in many of the soils in the eastern part of the county); (2) the use of crop varieties that are suited to the area and offer high yields; (3) adequate preparation of the seedbed; (4) planting or seeding the crop by suitable methods at the proper time and rate; (5) inoculation of legumes; (6) practicing shallow cultivation of row crops; (7) controlling weeds, insects, and diseases; (8) the use of cropping systems to help protect the soils from erosion (such as those suggested in the subsection "capability grouping"); (9) where needed, the establishment of grassed waterways, tillage on the contour, construction of terraces, and drainage of the soils; and (10) protection of the soils from overgrazing.

TABLE 2.—*Estimated average yields per acre of the principal crops under a high level of management*

[Dashes indicate the crop is not commonly grown on the soil, the soil is not suitable, or yield data are not available]

Soil	Corn	Oats	Cotton lint	Soybeans	Coastal bermudagrass	Bahiagrass and legumes	Coastal bermudagrass and legumes	Common bermudagrass and legumes	Tall fescue and legumes	Dallisgrass and legumes
	Bu.	*Bu.*	*Lb.*	*Bu.*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Adaton silt loam	----	50	----	22	----	165	----	135	255	150
Boswell fine sandy loam, 2 to 5 percent slopes	40	45	450	22	4.0	180	264	160	141	165
Brooksville silty clay, 0 to 2 percent slopes	60	80	625	25	4.0	165	282	165	210	165
Brooksville silty clay, 2 to 5 percent slopes	50	70	550	20	4.0	165	282	165	210	165
Catalpa silty clay loam	85	80	750	30	5.0	----	330	240	210	210
Falkner silt loam, 0 to 2 percent slopes	55	60	575	30	----	180	180	180	165	180
Falkner silt loam, 2 to 5 percent slopes	40	45	550	20	----	156	180	156	150	150
Freestone fine sandy loam, 0 to 2 percent slopes	45	50	450	22	3.5	195	225	150	150	180
Freestone fine sandy loam, 2 to 5 percent slopes	40	45	400	20	1.5	180	225	150	150	165
Gullied land-Sumter complex, 5 to 20 percent slopes	----	----	----	----	----	----	----	----	----	----
Houston silty clay	60	80	700	30	5.0	----	282	165	210	165
Kipling silty clay loam, 0 to 2 percent slopes	45	55	500	30	2.0	210	282	135	165	180
Kipling silty clay loam, 2 to 5 percent slopes, eroded	45	55	475	30	2.0	195	282	135	165	180
Kipling silty clay loam, 5 to 8 percent slopes, eroded	----	50	----	20	----	100	282	120	150	165
Kipling and Sumter soils, 17 to 40 percent slopes, severely eroded	----	----	----	----	----	----	----	----	----	----
Leeper silty clay loam	75	55	650	40	5.0	----	330	165	195	180
Longview silt loam, 0 to 2 percent slopes	45	55	420	22	3.5	210	240	165	150	150
Longview silt loam, 2 to 5 percent slopes	45	55	420	22	3.5	210	240	165	150	150
Maben fine sandy loam, 5 to 8 percent slopes, eroded	40	45	425	20	3.5	165	240	150	135	150

See footnote at end of table.

TABLE 2.—*Estimated average yields per acre of the principal crops under a high level of management*—Continued

Soil	Corn	Oats	Cotton lint	Soybeans	Coastal bermudagrass	Bahiagrass and legumes	Coastal bermudagrass and legumes	Common bermudagrass and legumes	Tall fescue and legumes	Dallisgrass and legumes
	Bu.	*Bu.*	*Lb.*	*Bu.*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Maben fine sandy loam, 8 to 12 percent slopes, eroded	---	35	---	---	2.5	150	180	147	75	---
Maben soils, 8 to 12 percent slopes	---	35	---	---	2.5	150	180	147	75	---
Maben and Ruston soils, 12 to 30 percent slopes	---	---	---	---	---	---	---	---	---	---
Mantachie loam	75	60	600	32	5.0	240	315	210	225	270
Marietta fine sandy loam	80	70	750	35	4.0	---	330	180	210	210
Mathiston silt loam	75	60	600	32	5.0	240	315	210	225	270
Myatt loam	---	---	---	---	---	---	---	120	195	---
Ochlockonee loam	80	70	700	35	5.5	300	360	250	240	300
Oktibbeha fine sandy loam, thick solum variant, 5 to 8 percent slopes, eroded	---	50	---	28	---	180	282	129	150	165
Oktibbeha silty clay loam, 2 to 5 percent slopes, eroded	50	55	500	28	4.0	195	282	135	165	180
Oktibbeha silty clay loam, 5 to 8 percent slopes, eroded	---	50	---	25	---	180	282	120	150	165
Oktibbeha soils, 8 to 17 percent slopes, severely eroded	---	---	---	---	---	75	---	90	---	---
Prentiss silt loam, 0 to 2 percent slopes	55	60	600	25	4.0	216	240	195	180	210
Prentiss silt loam, 2 to 5 percent slopes	50	58	520	22	3.8	210	240	180	180	210
Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded	55	60	600	22	3.5	225	255	170	180	180
Providence silt loam, heavy substratum, 5 to 8 percent slopes, eroded	50	55	500	20	3.0	195	225	150	165	150
Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	40	40	425	---	2.5	180	195	135	90	---
Ruston fine sandy loam, 2 to 5 percent slopes	65	60	575	30	5.0	250	315	195	170	---
Ruston and Maben soils, 12 to 30 percent slopes	---	---	---	---	---	---	---	---	---	---
Savannah fine sandy loam, 2 to 5 percent slopes, eroded	55	60	600	22	3.5	225	255	171	240	240
Savannah fine sandy loam, 5 to 8 percent slopes, eroded	50	55	500	20	3.0	255	225	150	165	150
Savannah fine sandy loam, 8 to 12 percent slopes, eroded	---	40	---	---	2.5	165	195	135	90	---
Sessum silty clay loam	---	45	---	25	4.0	210	282	135	160	180
Stough fine sandy loam	45	55	430	20	3.5	210	240	135	190	165
Sumter silty clay loam, 5 to 8 percent slopes, eroded	---	---	---	---	---	---	---	120	180	165
Sumter silty clay loam, 8 to 12 percent slopes, eroded	---	---	---	---	---	---	---	70	120	60
Sumter and Binnsville soils, 2 to 5 percent slopes, eroded	---	30	---	---	---	---	---	80	135	75
Sumter and Binnsville soils, 5 to 8 percent slopes, eroded	---	---	---	---	---	---	---	75	120	70
Urbo silty clay loam	80	---	---	30	4.0	210	290	150	240	210
Wilcox silt loam, 0 to 2 percent slopes	---	35	---	20	---	168	216	135	165	135
Wilcox silty clay loam, 2 to 5 percent slopes, eroded	35	35	400	20	---	165	216	140	160	---
Wilcox silty clay loam, 5 to 8 percent slopes, eroded	---	30	---	---	---	165	216	130	156	---
Wilcox silty clay loam, 8 to 12 percent slopes, eroded	---	---	---	---	---	156	216	120	156	---
Wilcox silty clay loam, 12 to 35 percent slopes, eroded	---	---	---	---	---	---	---	---	---	---

[1] Cow-acre-days is a term used to express the carrying capacity of a pasture. It is the number of animal units carried per acre multiplied by the number of days the pasture is grazed during the year without injury to the sod. For example, an acre of pasture that provides 30 days of grazing for two cows has a carrying capacity of 60 cow-acre-days.

Use of Soils for Woodland [3]

This section contains information that can be used by woodland owners, foresters, and farmers in developing and carrying out plans for profitable tree farming.

An area of approximately 148,800 acres, or 51 percent of the total land area of 290,560 acres in Oktibbeha County, is presently classified as commercial forest. This forest can be further subdivided by ownership classes as follows:

	Acres
Farmer-owned	23,800
Forest industry	14,300
National forest	100
Other public	23,100
Miscellaneous private	87,500

Major ownerships in Oktibbeha County are the 15,880-acre tract included in the Noxubee Wildlife Refuge and the 5,741-acre tract included in the Mississippi State University Forest. Both of these are included in the "other public" category in the above classification.

The commercial forest can also be subdivided into forest types. A forest type is made up of trees of similar character growing under the same ecological and biological conditions. A forest type is named for the species that are present in the greatest abundance and frequency (*11*). In this county the oak-hickory forest type, composed mainly of upland oaks and hickories but including a few red maples, elms, and yellow-poplars, is of most importance. This forest type occupies about 57,600 acres, mainly in the northeast and east-central parts of the county.

The oak-pine forest type is characterized by upland oaks, sweetgum, blackgum, hickory, and yellow-poplar growing in a mixture with loblolly and shortleaf pines. It occupies approximately 24,000 acres in the western and south-central parts of the county.

The loblolly-shortleaf pine forest type occupies about 38,400 acres. It is interspersed with the oak-pine forest type throughout the western part of the county, and to a lesser extent, with the oak-hickory forest type in the eastern part. In many stands loblolly pine dominates over shortleaf pine in a ratio of almost three to one, and in some instances, loblolly pine grows in almost pure stands (fig. 6). Common associates of the loblolly-shortleaf pine forest type are upland oaks, hickories, sweetgum, and blackgum.

The longleaf-slash pine forest type occupies about 4,800 acres in Oktibbeha County. This acreage is mainly in slash pine plantations. There are no native stands of longleaf or slash pine in the county, since it is far to the north of the natural range of these two species.

The oak-gum cypress forest type consists chiefly of tupelo, blackgum, sweetgum, water oak, willow oak, and baldcypress. It occupies about 24,000 acres of bottom land along the Noxubee River and its principal tributaries. Areas of this forest type are along the Sand, Cypress, and Hollis Creeks in the southwest and south-central parts of the county; the Sun and Line Creeks in the northeast part; and Sand and Catalpa Creeks in the east-central part. Common associates are cottonwood, black willow, ash, elm, hackberry, and red maple.

In many instances the forest types described in the foregoing paragraphs merge and intermingle. Delineations are indistinct, and frequently the types blend into each other through subtle zones of transition.

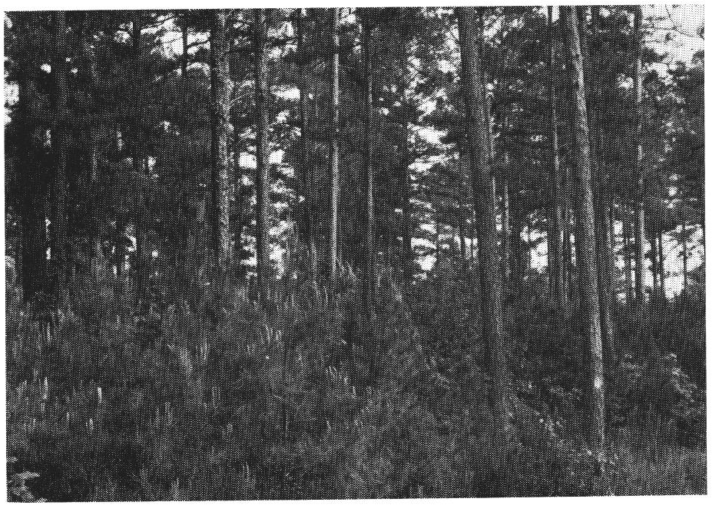

Figure 6.—A stand of loblolly pine sawtimber on Longview silt loam, 0 to 2 percent slopes. This soil is in woodland suitability group 2w8.

Wood-using industries

In 1966 there was one large sawmill loacted at Sturgis that had an output of more than 3 million board feet per year. A total of five small sawmills had an output of less than 3 million board feet per year. Three of these were in the vicinity of Maben, one was in Adaton, and one in Longview. Production of saw-logs in 1966 totaled 5,884,000 board feet, including 3,528,000 board feet of hardwoods and 2,356,000 feet of softwoods (*15*).

In 1966, Oktibbeha County produced some 7,000 fence posts, 2,000 poles, and 10,000 linear feet of piling, all softwoods. Miscellaneous products, such as cooperage bolts and handle stock, amounted to 58,000 board feet, all hardwoods.

In 1967, Oktibbeha County produced a total of 11,153 standard cords of pulpwood, including 8,684 cords of pine and 2,469 cords of hardwoods (*13*). At that time, five pulpwood dealers were operating in the county.

Besides furnishing raw material for the wood-using industries and affording employment for hundreds of workers, the woodlands of Oktibbeha County provide habitat and food for wildlife and offer opportunity for sport and recreation to thousands of users annually. These woodlands also afford watershed protection, enhance the quality and value of the water resource, and furnish limited native forage for grazing animals. Collectively, the county's woodlands contribute substantially to the local economy, as well as to the social and spiritual well-being of the people concerned.

Woodland suitability groups

To assist owners of woodland and others in planning the management of woodland and setting priorities for treatment, the soils of this county have been placed in woodland suitability groups. Shown in table 3 are each of these groups and the map symbols of the soils in each group. Each group is made up of soils that have about

[3] Joseph V. Zary, forester, assisted in preparing this section.

TABLE 3.—*Soils rated for woodland use*

[Gullied land-Sumter complex, 5 to 20 percent slopes, not rated because properties are variable]

Woodland suitability group	Soil	Potential productivity: Tree species [1]	Potential productivity: Average site index and standard deviation [2]	Potential productivity: Range of site index	Hazards and limitations: Erosion hazard	Hazards and limitations: Equipment restriction	Hazards and limitations: Seedling mortality	Species suitable for planting
Group 1w5: Moderately well drained and somewhat poorly drained soils on the flood plains. Moderate to slow permeability; high available water capacity.	Catalpa: Cp.	Green ash	101	79–106	Slight	Moderate	Moderate	Cottonwood, sweetgum, and sycamore.
		Cottonwood	[3] 108	88–118				
		American elm						
		Slippery elm						
		Hackberry						
		Sweetgum	[3] 100	88–107				
		Sycamore						
	Marietta: Mt.	Green ash		80–100	Slight	Moderate	Moderate	Cottonwood, sweetgum, sycamore, and yellow-poplar.
		Cottonwood		90–110				
		American elm						
		Slippery elm						
		Hackberry						
		Red oak						
		White oak						
		Sweetgum		90–105				
		Sycamore						
		Yellow-poplar						
Group 1w6: Somewhat poorly drained soils on flood plains. Slow permeability; high available water capacity.	Leeper: Le.	Green ash	94	72–99	Slight	Severe	Severe	Green ash, cottonwood, sweetgum, and sycamore.
		Cottonwood	110	85 115				
		American elm						
		Slippery elm						
		Hackberry						
		Sweetgum	95	90–105				
		Sycamore						
		Durand oak						
Group 1w9: Somewhat poorly drained soils on flood plains. Moderate permeability; available water capacity medium to very high.	Mantachie: Ms. Mathiston: Mu.	Green ash	88±10	66–93	Slight	Severe	Moderate to severe.	Green ash, cottonwood, Cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, loblolly pine, sweetgum, sycamore, and yellow-poplar.
		Cottonwood	92	72–102				
		Hackberry						
		Cherrybark oak	101± 4	89–106				
		Nuttall oak		99–111				
		Shumard oak						
		Southern red oak						
		Swamp chestnut oak.						
		Water oak	94± 5	82–101				
		White oak						
		Willow oak	96± 6	86–100				
		Loblolly pine	98– 7	90–106				
		Sweetgum	100± 6	88–107				
		Sycamore						
		Black tupelo						
		Black walnut						
		Yellow-poplar						

Group 2o7: Well drained and moderately well drained soils. Permeability is moderate to moderately slow. Available water capacity is medium.	Ochlockonee: Oc.	River birch			Slight	Slight	Slight	Cherrybark oak, Shumard oak, swamp chestnut oak, loblolly pine, sweetgum, sycamore, and yellow-poplar.
		Black cherry						
		Cottonwood						
		American elm						
		Slippery elm						
		Hackberry						
		Hickories, except water.						
		Southern magnolia						
		Red maple						
		Cherrybark oak	87	75–94				
		Nuttall oak	[3] 85	73–92				
		Southern red oak						
		Water oak	82	70–89				
		White oak						
		Willow oak	[3] 85	75–89				
		Loblolly pine	95± 6	89–105				
		Sweetgum	90± 5	78–99				
		Sycamore						
		Black tupelo						
		Black walnut						
	Prentiss: PnA, PnB.	Hickories, except water.			Slight	Slight	Slight	Loblolly pine, cherrybark oak, and Shumard oak.
		Cherrybark oak		80–95				
		Swamp chestnut oak.						
		White oak						
		Loblolly pine	88	83–96				
		Shortleaf pine	79	75–85				
		Sweetgum		80–95				
		Black tupelo						
Group 2w6: Somewhat poorly drained soils on flood plains. Very slow permeability; high available water capacity.	Urbo: Ur.	Green ash	94± 2	72 106	Slight	Severe	Moderate to severe.	Shumard oak, swamp chestnut, oak, sycamore, and yellow-poplar.
		Cottonwood	100	80–110				
		American elm						
		Slippery elm						
		Hackberry						
		Hickories, except water.						
		Southern magnolia						
		Red maple						
		Cherrybark oak	99± 2	87–108				
		Laurel oak						
		Nuttall oak	108± 6	96–110				
		Water oak	96± 11	84–103				
		White oak						
		Willow oak	100± 10	90–104				
		Persimmon						
		Sweetgum	95± 8	88–105				
		Black tupelo						

See footnotes at end of table.

TABLE 3.—*Soils rated for woodland use*—Continued

Woodland suitability group	Soil	Potential productivity: Tree species [1]	Potential productivity: Average site index and standard deviation [2]	Potential productivity: Range of site index	Hazards and limitations: Erosion hazard	Hazards and limitations: Equipment restriction	Hazards and limitations: Seedling mortality	Species suitable for planting
Group 2w8: Somewhat poorly drained to moderately well drained soils. Permeability is moderately slow to slow. Available water capacity is medium to high.	Falkner: FaA, FaB.	Cherrybark oak		80–100	Slight	Moderate	Slight	Cherrybark oak, Shumard oak, water oak, loblolly pine, shortleaf pine, and sweetgum.
		Swamp chestnut oak.						
		Water oak		70–90				
		White oak						
		Loblolly pine	86± 5					
		Shortleaf pine	76					
		Sweetgum	88	80–95				
		Sycamore						
		Yellow-poplar						
	Freestone: FrA, FrB.	Red oak			Slight	Moderate	Slight	Loblolly pine
		Water oak						
		White oak						
		Loblolly pine	86± 4	80–90				
		Shortleaf pine	79	70–80				
		Sweetgum	[3] 90	80–100				
	Longview: LoA, LoB.	Cherrybark oak			Slight	Moderate	Slight	Cherrybark oak, Shumard oak, loblolly pine, and sweetgum.
		Shumard oak						
		Water oak	[3] 90	80–100				
		Loblolly pine	87± 7	80–95				
		Shortleaf pine	79± 5	73–85				
		Sweetgum	[3] 90	80 100				
	Stough: St.	Hickories, except water.			Slight	Moderate	Slight	Cherrybark oak, Shumard oak, loblolly pine, and sweetgum.
		Cherrybark oak		75–90				
		Swamp chestnut oak.						
		White oak						
		Loblolly pine	88± 5	82–95				
		Sweetgum		75–90				
		Black tupelo						
Group 2w9: Poorly drained soils on broad flats. Permeability is moderately slow. Available water capacity is medium to high.	Myatt: My.	Cherrybark oak	86	71–93	Slight	Severe	Severe	Shumard oak, swamp chestnut oak, loblolly pine, sweetgum, and yellow-poplar.
		Shumard oak						
		Southern red oak						
		Swamp chestnut oak.						
		Water oak	86	71–93				
		White oak						
		Willow oak	74	70–80				
		Loblolly pine	95± 6	88–102				
		Sweetgum	92	77–99				
		Sycamore						
		Black tupelo						
		Yellow-poplar						

Group 2c8: Well-drained to somewhat poorly drained soils on uplands. Permeability is slow to very slow. Available water capacity is medium to high.	Kipling: KlA, KlB2, KlC2, Kipling part of KsF3.	Cherrybark oak	90	80–100	Slight	Moderate	Moderate	Cherrybark oak Shumard oak, loblolly pine, and sweetgum.
		Durand oak	----	----				
		Shumard oak	----	----				
		Water oak	----	----				
		White oak	----	----				
		Loblolly pine	90	80–100				
		Sweetgum	90	80–100				
Group 3o1: Well-drained soils on uplands. Permeability is moderate to moderately slow. Available water capacity is medium to high.	Ruston: RtB and Ruston part of MrF and RuE.	*Loblolly pine*	84± 5	76–90	Slight	Slight	Slight	Loblolly pine.
		Shortleaf pine	75± 4	66–80				
Group 3o7: Moderately well drained soils with a fragipan. Permeability is moderately slow. Available water capacity is medium.	Providence: PsB2, PsC2, PsC3.	Cherrybark oak	[3] 95	85–105	Slight	Slight	Slight	Cherrybark oak,[4] Shumard oak,[4] and swamp chestnut oak.[4]
		Shumard oak	----	----				
		Swamp chestnut oak.	----	----				
		Water oak	----	70–85				
		White oak	----	----				
		Loblolly pine	84±10	73–95				
		Shortleaf pine	64± 7	58–73				
		Sweetgum	90	80–100				
		Sycamore	----	----				
	Savannah: SaB2, SaC2, SaD2.	Southern red oak	75	70–80	Slight	Slight	Slight	Loblolly pine and shortleaf pine.
		Loblolly pine	81± 5	75–86				
		Shortleaf pine	76± 4	70–81				
		Sweetgum	[3] 80	75–85				
Group 3w9: Poorly drained soils on upland flats. Permeability is moderately slow to slow. Available water capacity is very high.	Adaton: Ad.	White ash	----	----	Slight	Severe	Severe	Shumard oak, swamp chestnut oak, loblolly pine, sweetgum, and yellow-poplar.
		Hickories, except water.	----	----				
		Cherrybark oak	90	75–97				
		Swamp chestnut oak.	----	----				
		Water oak	94	79–101				
		White oak	----	----				
		Loblolly pine	84	75–95				
		Sweetgum	98	78–105				
		Sycamore	----	----				
		Black tupelo	----	----				
		Yellow-poplar	----	----				
Group 3c2: Well drained, moderately well drained, and somewhat poorly drained soils on uplands. Permeability is moderate to very slow. Available water capacity is medium to high.	Boswell: BoB.	*Loblolly pine*	82± 4	74–87	Slight	Moderate	Moderate	Loblolly pine and shortleaf pine.
		Shortleaf pine	72± 4	67–77				
	Maben: MbC2, MbD2, MeD, Maben part of MrF.	*Loblolly pine*	83	76–88	Slight to moderate.	Moderate	Slight	Loblolly pine and shortleaf pine.
		Shortleaf pine	73	67–78				
	Wilcox: WcA, WlB2, WlC2, WlD2, WlF2.	*Loblolly pine*	81± 3	76–85	Slight	Moderate	Moderate	Loblolly pine.
		Shortleaf pine	68± 5	63–75				
		Eastern redcedar	45	40–50				

See footnotes at end of table.

TABLE 3.—*Soils rated for woodland use*—Continued

Woodland suitability group	Soil	Potential productivity			Hazards and limitations			Species suitable for planting
		Tree species [1]	Average site index and standard deviation [2]	Range of site index	Erosion hazard	Equipment restriction	Seedling mortality	
Group 3c8: Poorly drained to moderately well drained soils on uplands. Permeability is slow to very slow. Available water capacity is high.	Oktibbeha: OlB2, OlC2, OhC2, OtE3.	Southern red oak	[3] 70	65–75	Slight	Moderate	Moderate	Loblolly pine and eastern redcedar.
		Loblolly pine	76± 5	69–82				
		Shortleaf pine	66± 4	60–72				
		Eastern redcedar	45	40–50				
	Sessum: Se.	Southern red oak	------	------	Slight	Moderate	Moderate	Loblolly pine and eastern redcedar.
		White oak	------	------				
		Loblolly pine	83± 3	75–90				
		Sweetgum	80	70–90				
		Eastern redcedar	------	------				
Group 4c2c: Somewhat poorly drained, moderately well drained, and well drained soils on uplands. Permeability is slow to very slow. Available water capacity is medium to high.	Brooksville: BrA, BrB.	Eastern redcedar	40	------	Slight to moderate.	Moderate	Moderate	Eastern redcedar.
	Houston: Ho.	Eastern redcedar	40	35–45	Slight	Moderate	Moderate	Eastern redcedar.
	Sumter: SuC2, SuD2, Sumter part of KsF3, SvB2, and SvC2.	Eastern redcedar	37± 5	32–45	Moderate	Moderate	Moderate	Eastern redcedar.
Group 4d3c: Well-drained soils on uplands. Permeability is slow. Available water capacity is low to medium.	Binnsville part of SvB2 and SvC2.	Eastern redcedar	40	35–45	Slight to moderate.	Moderate	Severe	Eastern redcedar.

[1] Information for broadleaf trees developed by WALTER M. BROADFOOT, Southern Hardwoods Laboratory, Southern Forest Experiment Station, U.S. Forest Service, Stoneville, Mississippi. Species in italics is the indicator species.

[2] Site index is the average height in feet of dominant and codominant trees at 50 years of age for all species except cottonwood, which is at 30 years.

[3] Estimated site index based on a similar soil or another species on the same soil.

[4] Hardwoods not suitable where soils are severely eroded.

the same suitability for wood crops, that require about the same management, and that have about the same potential productivity.

Potential productivity is expressed as site index. Site index is the average height in feet of dominant and codominant trees at 50 years of age for all species except cottonwood, which is at 30 years. Site indexes are recorded for the most important tree species that commonly occur on the soils of each woodland suitability group. These site indexes are based on soil-woodland correlation studies and available research data (*4*).

As shown in table 3, each woodland suitability group has, in varying degree, certain problems and limitations that affect its management. These problems and limitations are expressed in the relative terms of slight, moderate, or severe. These terms express the degree to which the problems or limitations apply. Each problem or limitation, together with the rating criteria, are explained in detail below.

Erosion hazard is the degree of potential soil erosion. Ratings are based on the risk of erosion expected on well-managed woodland. These ratings are further related to differences in soil stability and permeability, slope, surface runoff, water storage capacity, and disturbances of vegetation. A rating of *slight* indicates that problems of erosion control are unimportant and that only a small loss of soil is expected. Generally, erosion hazard is slight if the slopes range from 0 to 2 percent and runoff is slow or very slow. Erosion hazard is *moderate* where a medium soil loss is expected unless runoff is controlled and adequate plant cover for protection of soil is maintained. In this case some attention must be given to prevent unnecessary soil erosion. Erosion hazard is *severe* where slopes are steep, runoff is rapid, and soils show evidence of past erosion. In such cases, intensive treatments and special methods of operation must be planned and specialized equipment used to minimize soil erosion.

Equipment restrictions or trafficability were rated on the basis of the characteristics of the soil that limit or prohibit the use of equipment commonly used in woodland operations such as felling, bucking, skidding, loading, and hauling. Consideration was also given to special equipment used in spraying, tree planting, direct seeding, and firefighting. Ratings are based on such physical soil characteristics as texture, stability, and plasticity and are also related to slope, wetness, and the presence or absence of stones, ledges, and other obstructions.

Equipment restriction was rated *slight* if the use of equipment was not limited in kind or time of year. The rating was *moderate* if the use of equipment was limited to a medium degree in kind of operations by one or more of the following factors: moderately steep slope, soil wetness in winter and spring, and physical soil characteristics such as the presence of plastic clay. The rating was *severe* if special equipment was needed and its use was seriously limited by one or more of the factors listed for "moderate," above, and by safety in operations.

Soil wetness imposes more serious limitations than any of the other factors listed above. Thus, soil mapping units with equipment restriction ratings of moderate and severe are seasonally or excessively wet. (Refer to table 3.) To a lesser degree, clayey soils also impose limitations, but these have moderate ratings.

Seedling mortality, or regeneration potential, refers to the failure of tree seedlings to survive and grow, due primarily to soil or topographic conditions. It is assumed that plant competition and rainfall are not limiting factors. The term "seedlings" applies to (1) naturally occurring seedlings, (2) direct-seeded seedlings, and (3) planted seedlings. In each of these three methods of regeneration it is assumed that the seedlings initially established are of species well-suited to the soil and total site. In the case of *naturally occurring* seedlings, it is assumed there is (1) adequate seed source, (2) acceptable rates of seed germination, and (3) favorable sites. In the case of *direct-seeded* seedlings it is assumed that there are (1) acceptable rates of seed germination, (2) proper treatment of seed with bird and rodent repellents, (3) adequate rates of seeding, and (4) favorable seedbeds. For *planted* seedlings it is assumed that (1) quality of planting stock is good, (2) packing, handling, heeling-in or storage of seedlings is properly done, (3) planting sites are favorable, and (4) planting techniques are correct and planting of seedlings is done with reasonable care.

Seedling mortality is rated *slight* if no more than 25 percent of the seedlings initially established by (1) natural seeding, (2) direct-seeding, or (3) tree planting, and constituting adequately stocked stands of 700 to 1,000 seedlings per acre, die within the first growing season. Normally, there is no special problem in obtaining adequately stocked stands if the rating for mortality is slight.

A rating of *moderate* indicates that losses of between 25 and 50 percent of the seedlings established by one of the above methods can be expected. Usually, some interplanting will be needed to reinforce the initial planting and bring stocking up to the desired level. Direct-seeding in spots or small areas may also be done to obtain fully or adequately stocked stands where initial direct-seeding failed or natural seeding was not satisfactory.

A rating of *severe* indicates that seedling losses of over 50 percent can be expected. Such losses may be experienced on adverse sites and especially on soils that are excessively wet. In such cases, replanting or a second attempt at direct-seeding may be needed to obtain adequate stocking. Special site preparation such as "bedding" may also be tried.

The following is an explanation of the symbols in each woodland suitability group.

The first element of the group symbol, an Arabic numeral, indicates the woodland suitability class. This numeral expresses site quality classes. Class 1, the highest in potential productivity, is followed by classes 2, 3, and 4. Site quality is based on the average site index of one or more indicator forest types or tree species. The indicator species are in italic type in table 3.

The second element in the symbol, a lower case letter, indicates suitability subclass, which is based on soil properties that cause hazards or limitations in woodland management. These subclasses are explained as follows:

Subclass o (*slight or no limitations*). Soils with no significant restrictions or limitations for woodland use or management.

Subclass w (excessive wetness). Soils in which excessive water, either seasonally or year long, causes significant limitations for woodland use or management. These soils have restricted drainage, high water tables, or overflow hazards that adversely affect either development or management of the stand.

Subclass d (restricted rooting depth). Soils that have restrictions or limitations for woodland use or management because of restricted root depth. Examples are soils shallow to hard rock, hardpan, or other layers in the soil that restrict roots.

Subclass c (clayey soils). Soils having restrictions or limitations for woodland use or management because of the kind or amount of clay in the upper part of the soil profile.

Some kinds of soil may have more than one set of subclass characteristics. *Priority in placing each kind of soil in a subclass is in the order that the subclass characteristics are shown in the foregoing explanation of the subclasses.*

The third element in the symbol, an Arabic numeral, indicates the degree of hazards or limitations and the general suitability of the soils for certain kinds of trees. The three management limitations considered in this element are (1) *erosion hazard*, (2) *equipment restrictions*, and (3) *seedling mortality*.

The *numeral 1* indicates soils that have no or only slight management limitations and that are particularly suited to needleleaf trees.

The *numeral 2* indicates soils that have one or more moderate management limitations and are particularly suited to needleleaf trees.

The *numeral 3* indicates soils that have one or more severe management limitations and are particularly suited to needleleaf trees.

The *numeral 5* indicates soils that have one or more moderate management limitations and are particularly suited to broadleaf trees.

The *numeral 6* indicates soils that have one or more severe management limitations and are particularly suited to broadleaf trees.

The *numeral 7* indicates soils that have no or slight management limitations and are suitable for either needleleaf or broadleaf trees.

The *numeral 8* indicates soils that have one or more moderate management limitations and are suitable for either needleleaf or broadleaf trees.

The *numeral 9* indicates soils that have one or more severe management limitations and are suitable for either needleleaf or broadleaf trees.

The symbol c, following 4c2 and 4d3, indicates soils that are suited to Eastern redcedar.

Use of Soils for Wildlife [4]

The kinds and numbers of wild animals that inhabit any given area are there because their requirements for existence are present. These requirements generally are an adequate year-round food supply, cover for protection from enemies and weather, and for most of them, a water supply. Furthermore, these requirements must be present in a particular pattern or relationship that suits each animal. Take away one of these requirements, or alter the arrangement of them, and a limiting factor is created that can reduce or even eliminate wild animals from the area. Each kind of animal has somewhat different needs, but usually good conditions for several kinds can be met on the same site. Collectively, these animal requirements and their arrangement on the land is called habitat. Animal habitat is dependent upon soil conditions, on land use, and on moisture and other climatic features.

If we are to relate animals to any particular soil, we must do it through that soil's ability to produce the habitat conditions necessary. Since animals are dependent upon plant life either directly or indirectly, a soil's ability to produce a variety of plant life is important. A diet balanced in nutrients and minerals is necessary for the general health and vigor of wild animals, and here again, the soil plays an important part. Since many animals require surface water for drinking, the soil's suitability for holding water in either natural or man-made impoundments is significant to wildlife populations. So the general quality of wildlife habitat, which in turn will govern the numbers and kinds of wild animals, can be related directly to the soil.

Of all the factors that affect wildlife populations, the way man uses the land is the most important. Regardless of how well suited a soil may be for producing wildlife habitat, if the present land use eliminates the plant associations that make up this habitat, the animals will not be there. On the other hand, habitat can be created by applying sound wildlife management practices to increase wildlife populations.

Another factor in wildlife populations on any soil is that continuous changes take place naturally in vegetative patterns. Competition among plants is severe. As many kinds of plants invade an area, some become dominant and choke others out. The kind of soils usually dictates the plant species that becomes dominant. At some stage in this continual change, which we call ecological succession, good wildlife habitat usually occurs. As this succession progresses, wildlife habitat may deteriorate, regardless of the kinds of soil on which it is growing. The speed and the form that this change follows are different on the different soils.

Wildlife habitat requires planning, management, and maintenance, regardless of the soil. Management practices may vary from one kind of soil to the next. Habitat is obtained by manipulating existing vegetation to create desirable species and patterns, by altering land use patterns, or by planting certain types of food and cover plants. A combination of these methods is usually desirable. The influence of a soil on the growth of plants is known for many species and can be used in planning a wildlife program.

Oktibbeha County is broken down into six wildlife suitability groups. These groups are based on similarities of the soils in capacity to produce vegetative patterns suitable for various forms of wildlife. Each of these groups is discussed in the text, and in table 4 they are related to kinds of wildlife and kinds of native and planted foods.

[4] EDWARD G. SULLIVAN, biologist, Soil Conservation Service, assisted in the preparation of this section.

Openland and edge wildlife are bobwhite quail, dove, cottontail rabbit, a wide variety of song birds that are associated with open and semiopen farmland, and fox, skunk, and opossum.

Woodland wildlife are deer, squirrel, turkey, swamp rabbits, forest-dwelling song birds, bobcat, and raccoon.

Wetland wildlife, as used here, refers to ducks, but geese, snipe, rail, herons, shore birds, and furbearers are usually associated.

Only food plants are listed in table 4. Cover plants such as briers, weeds, brush, and vines are of equal importance for bobwhite quail and rabbits. Cover plants are not listed because of the wide variety of suitable plants adapted to all six groups. Practically anywhere in Oktibbeha County, suitable cover plants will grow naturally if encouraged. This can be the most important part of any wildlife program. Under cottontail rabbit and squirrel, no "planted food" column is indicated. Food is not ordinarily planted for squirrels although corn, peanuts, or nut trees could be. The cottontail rabbit eats such a wide variety of vegetation that naming the varieties would not be practical. Any adapted grain, grass, or clover can be used. Cover plants are the primary requirement for rabbits. If they are available, suitable food plants usually are present.

WILDLIFE SUITABILITY GROUP 1

This wildlife suitability group is coextensive with the Leeper-Marietta-Catalpa soil association. The soils are nearly level and are along major streams and the lower reaches of the stream tributaries. They are somewhat poorly drained to moderately well drained and are subject to occasional flooding, which is usually of short duration. These soils are medium acid to moderately alkaline. They have a deep root zone and a high available water capacity, which supports plants through extreme drought conditions.

Most of the areas are cleared and in crops. This is a hardwood timber site and, where not cleared, it produces a wide variety of hardwood trees and shrubs. Because available water capacity and natural fertility are favorable, johnsongrass and undesirable weeds are in serious competition with some of the better wildlife foods for quail and dove. Where plantings are made for wildlife, the plantings require cultivation to retard competition. The soils hold water and are suitable for commercial fish production if water for filling ponds is available. They are also suitable for shallow water impoundments for waterfowl.

Soils in this group produce plant associations and general habitat conditions suited to any species of wildlife common in Mississippi. The only real hazard is a possible temporary disruption of animal populations by flooding.

WILDLIFE SUITABILITY GROUP 2

This wildlife suitability group is coextensive with the Mathiston-Urbo and the Mantachie-Mathiston-Ochlockonee soil associations. The soils are nearly level and are along streams. They are somewhat poorly drained to well drained, and they are subject to flooding of short duration. These soils are very strongly acid to strongly acid. The available water capacity is very high to medium, but these soils are more susceptible to drought than those of wildlife suitability group 1.

Grasses and grains, as well as most summer annuals, do well on these soils. Lespedeza is fairly well suited to these soils. Lime is necessary for growing clover on these soils. Timber is on most areas, and pine and hardwoods are suitable. The soils hold water and are suitable for fish production in either dug-out or levee type ponds if water for filling the ponds is available. Selected sites are suitable for waterfowl developments.

These soils provide suitable environment for all species of wildlife that inhabit this county.

WILDLIFE SUITABILITY GROUP 3

The wildlife suitability group is coextensive with the Kipling-Sumter-Gullied land soil association. The association consists of unstable clays and of Gullied land with numerous chalk outcrops. The cover is mostly low grass and cedar, Osage-orange, and scrubby hardwoods. Because available water capacity is limited and the root zone is shallow, it is difficult to establish planted wildlife foods on this wildlife group. Valuable cover is produced naturally in small clumps, and there are a few native food plants, but generally this is an area of low productivity for wildlife. By picking small sites within this area, spring and fall crops such as vetch, grasses, and grains could be grown.

These soils are not suitable for intensive wildlife development but are capable of producing plant associations that can support low populations of openland and woodland wildlife. Most wildlife using this area have part of their home range in other adjacent wildlife suitability groups.

WILDLIFE SUITABILITY GROUP 4

This wildlife suitability group is coextensive with the Kipling-Savannah-Oktibbeha soil association and the Kipling-Brooksville-Sumter soil association. In these associations are somewhat poorly drained to well-drained, acid and alkaline, clayey and loamy soils on uplands. Slopes range from nearly level to steep. The nearly level sites are used mostly for pasture and crops. Sites suitable for both hardwoods and pines are present. These are deep soils with medium to high available water capacity. They are well suited to grasses.

A wide variety of native wildlife food and cover plants are suited to these soils. Lespedeza can be grown on most of these soils. Clover on the acid soils require lime for good production. Planting sites for wildlife food must be selected on 0 to 5 percent slopes. Steeper sites should not be plowed, because of an erosion hazard. Because of the rolling topography, pond sites are numerous.

This area is moderately well suited to openland and woodland wildlife.

WILDLIFE SUITABILITY GROUP 5

This wildlife suitability group is coextensive with the Longview-Falkner-Prentiss and the Stough-Prentiss-Myatt soil associations. The soils are acid, loamy and poorly drained to moderately well drained or well drained. They have medium to very high available water capacity. This area is known as the flatwoods. Both pine and hardwoods are suited to these soils, and most of this area is presently in woods.

This area is generally good for woodland wildlife habitat because of the present land use, but management for quail and rabbits is feasible. Several native and planted quail foods are adapted, provided sufficient lime is added. Ponds built in this area also require lime for better fish production.

Soils in this group are particularly suited to woodland wildlife, but can produce plant associations suited to openland wildlife if special planning and maintenance is practiced.

WILDLIFE SUITABILITY GROUP 6

This wildlife suitability group is coextensive with the Maben-Ruston-Savannah and the Wilcox soil associations. In these associations are clayey and loamy, acid soils of

TABLE 4.—*Potential food plants*

Wildlife suitability groups	Openland and edge wildlife (farm game)				
	Bobwhite quail		Cottontail rabbit	Dove	
	Native food plants	Planted foods	Food plants	Native food plants	Planted foods
Group 1: Nearly level, medium acid to moderately alkaline soils subject to flooding; mostly cropland. Association 1.	Partridgepea, wild bean, beggarticks, and oak trees.	Cowpeas, millet, common and bicolor lespedeza, and soybeans.	Grains, clover, and native grasses.	Paspalum, amaranth, woolly croton, and panicgrass.	Browntop millet, corn, sorghum, sunflower, and proso.
Group 2: Nearly level, acid soils subject to flooding; mostly woodland. Associations 2 and 3.	Partridgepea, lespedeza, beggarticks, and oak trees.	Millet, bicolor lespedeza, and soybeans.	Grains, clover, vetch, and native grasses.	Paspalum, woolly croton, and amaranth.	Sunflower, soybeans, corn, proso, and browntop millet.
Group 3: Unstable clays and Gullied land and chalk outcrop; sloping upland soils; mostly in cedar and Osage-orange. Association 5.	Single-seed croton and Osage-orange.	Lespedeza, and common vetch.	Native grasses and vetch.	Single-seed croton.	Not suitable____
Group 4: Acid and alkaline, clayey and loamy, nearly level to steep soils; mostly pasture and cropland. Associations 4 and 6.	Common lespedeza, woolly croton, partridgepea, oak trees, and Osage-orange.	Lespedeza, cowpeas, soybeans, millet, and vetch.	Grains, clover, vetch, and native grasses.	Paspalum, woolly croton, and panicgrass.	Browntop millet, corn, and sorghum.
Group 5: Acid, loamy, nearly level to gently sloping soils; mostly woodland. Associations 9 and 10.	Partridgepea, beggarticks, broomsedge, and oak trees.	Lespedeza, cowpeas, millet, soybeans, and wheat.	Grains, clover, and native grasses.	Paspalum, woolly croton, and panicgrass.	Browntop millet, corn, and sorghum.
Group 6: Acid, loamy and clayey, hilly soils; mostly woodland. Associations 7 and 8.	Beggarticks, partridgepea, and lespedeza.	Lespedeza, cowpeas, and soybeans.	Grains, clover, and native grasses.	Woolly croton and panicgrass.	Browntop millet, corn, and sorghum.

the uplands. The soils are now wooded with pines and hardwoods. Because they are highly erosive they should be kept under a permanent cover of vegetation. Sites for wildlife plantings and clearings should be picked on ridgetops and lower slopes to avoid excessive steepness.

The lespedezas, both native and planted, are suited to these soils. Other wildlife foods to be planted here require lime to correct the acid condition in some of the eroded spots. Both the native and the planted wildlife food plants need fertilizer. Pond sites are numerous, and there is usually no water-holding problems. Lime is necessary for good fish production in ponds. This area is well suited to forest game. Openland game habitat can be developed on these soils with special planning.

by wildlife suitability groups

Woodland wildlife (forest game)					Wetland wildlife (waterfowl)	
Squirrel	Deer		Turkey			
Native food plants	Native food plants	Planted foods	Native food plants	Planted foods	Native food plants	Planted foods
Maple, mulberry, oak, beech, and hickory trees.	Greenbrier, honeysuckle, and all hardwoods.	Grains, clover, ryegrass, and tall fescue.	Dogwood, paspalum, and grapes.	Grains, clover, ryegrass, and bahiagrass.	Smartweed, sedges, and oak trees.	Chufa, tall fescue, corn, Japanese millet, browntop millet, and rice.
Oak, hickory, and maple trees.	Greenbrier, honeysuckle, and all hardwoods.	Grains, white clover, ryegrass, and tall fescue.	Oak acorns, grapes, and blackgum.	Grains, white clover, ryegrass, and bahiagrass.	Oak trees, smartweed, and sedges.	Chufa, tall fescue, Japanese millet, browntop millet, corn, and rice.
Not suitable	Not suitable	Not suitable	Not suitable	Not suitable	Not suitable	Not suitable.
Oak, hickory, dogwood, and maple trees.	Greenbrier, honeysuckle, and all hardwoods.	Grains, clover, and ryegrass.	Oak acorns, grapes, paspalum, and blackberry.	Grains, clover, ryegrass, and bahiagrass.	Not suitable	Not suitable.
Oak, hickory, ash, and maple trees.	Oak, dogwood, honeysuckle, and greenbrier.	Grains, clover, and ryegrass.	Oak acorns, grapes, and huckleberry.	Grains, clover, ryegrass, and bahiagrass.	Not suitable	Not suitable.
Oak, dogwood, hickory, ash, and maple trees.	Oak, dogwood, honeysuckle, and greenbrier.	Grains, clover, and corn.	Oak acorns, grapes, and huckleberry.	Grains, grass, clover, and bahiagrass.	Not suitable	Not suitable.

Use of Soils for Engineering[5]

This section deals with soil as construction material. It explains the physical and chemical properties of the soils as they affect the construction and maintenance of roads, airports, pipelines, and building foundations and of structures for water storage, erosion control, drainage, and sewage disposal. Among the soil properties considered as most important are permeability to water, strength against shearing, ease or difficulty of compaction, texture, shrink-swell potential, plasticity, and reaction (pH). Also important are topography and the depth to consolidated material. The information in this survey can be used to:

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils that will aid in planning agricultural drainage systems, farm ponds, irrigation systems, terraces, waterways, and diversion terraces.
3. Make preliminary evaluations of soils and ground conditions that will aid in selecting locations for highways and airports and in planning detailed investigations of the selected sites.
4. Locate probable sources of sand and other construction material.
5. Correlate performance of engineering structures with the soils, and thus develop information that will be useful in designing and maintaining the structures.
6. Determine the suitability of soil mapping units for cross-country movement of vehicles and construction equipment.
7. Supplement the information obtained from other published maps and reports and aerial photographs for the purpose of preparing maps and reports that can be used readily by engineers.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.

Using the soil map for identification, the engineering interpretations in this subsection can be useful for many purposes. It should be emphasized, however, that they may not eliminate the need for sampling and testing at the site of specific engineering works where the loads are heavy and where the excavations are deeper than here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some of the terms used by soil scientists may not be familiar to the engineer, and some terms may have a special meaning in soil science. Several of these terms are defined in the Glossary at the back of this survey.

Most of the information in this subsection is given in tables 5, 6, and 7, but additional information useful to engineers can be found in other sections of this survey, particularly "Descriptions of the Soils" and "Formation and Classification of Soils."

[5] VICTOR L. BYRD, agricultural engineer, Soil Conservation Service, assisted in preparing this subsection.

In table 5 the physical and chemical properties of the soil are estimated. Such properties are USDA textures, engineering classifications, and reaction or pH. In table 6 the suitability of the soils as a source of construction materials is rated and the soil features affecting the location and construction of highways, dikes or levees, farm ponds, drainage systems, irrigation systems, terraces, and waterways are noted. Table 7 contains test data for Longview and Sumter soils.

Engineering classification systems

The two most commonly used systems in classifying samples of soil horizons for engineering are the AASHO system adopted by the American Association of State Highway Officials (*1*) and the Unified Soil Classification System (*14*) used by the Soil Conservation Service engineers, Department of Defense, and others. Both are used in this survey and are explained in the following paragraphs.

The AASHO system is used to classify soils according to those properties that affect use in highway construction. In this system, a soil is placed in one of seven basic groups ranging from A–1 through A–7 on the basis of grain-size distribution, liquid limit, and plasticity index. On group A–1 are gravelly soils of high bearing strength (the best soils for subgrades), and at the other extreme, clay soils that have low strength when wet (the poorest soils for subgrades). Where laboratory data are available to justify a further breakdown within each of the principal groups, the relative engineering value of the soil material is indicated by a group index number. Group index numbers range from 0 (A–1) for the best material to 20 (A–7) for the poorest material. The AASHO classification for tested soils, with index numbers in parentheses, is shown in table 7; the estimated classification for all soils mapped in Oktibbeha County is given in table 5.

In the Unified system soils are classified according to particle-size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. There are 8 classes of coarsed-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; 6 classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, ML–CL.

Engineering properties of the soils

To make the best use of the soil map and soil survey, the engineer needs to know the physical properties of the soil materials and the in-place condition of the soils. This information is useful in forming design recommendations for the soil units delineated on the soil map. The estimated properties are based on the results of laboratory tests, on observations made in the field, and on experience with the behavior of the soils when used in engineering structures.

Table 5 lists the estimated physical and chemical properties of each soil series recognized in Oktibbeha County. The estimates are given for each significant layer of a typical profile. The depth to seasonal high water table is estimated for each soil series.

In table 5 the soils are classified according to the textural classes of the U.S. Department of Agriculture. The texture is determined by the relative proportions of sand, silt, and clay in soil material that is less than 2.0 millimeters in diameter. "Sand", "silt", "clay", and some of the other terms used in the USDA textural classification are defined in the glossary of this survey. The AASHO and Unified classifications have been explained earlier in this section.

Permeability of the layers, in inches of water percolation per hour, was estimated for the soils in place. It does not include lateral seepage. The estimates were based on structure and porosity of the soil. Plowpans, surface crusts, and other properties resulting from the use of the soils were not considered.

The available water capacity, estimated in inches per inch of the soil depth, is that amount of capillary water in the soil available for plant growth after all free water has drained away.

The acid or alkaline reaction of the soil is expressed in pH. A pH of 7.0 is neutral; values lower than 7.0 are acid, and values higher are alkaline. Knowledge of reaction is useful if pipelines are to be constructed, as it indicates, among other things, likelihood of corrosion.

Depth to bedrock was not listed in a separate column, as only Binnsville, Oktibbeha and Sumter overlie chalk at depth of 7 to 54 inches.

The shrink-swell potential is rated according to the expected volume change of the soil layers that is a result of change in the content of moisture. It is estimated primarily on the basis of the amount and type of clay in the soil layers and is rated as low, moderate, high, or very high in table 5. Shrinking during dry periods and swelling during wet periods cause much damage to building foundations, roads, and other structures. A soil that has high shrink-swell potential (fig. 7) indicates hazards to the maintenance of structures constructed in, on, or with such soil.

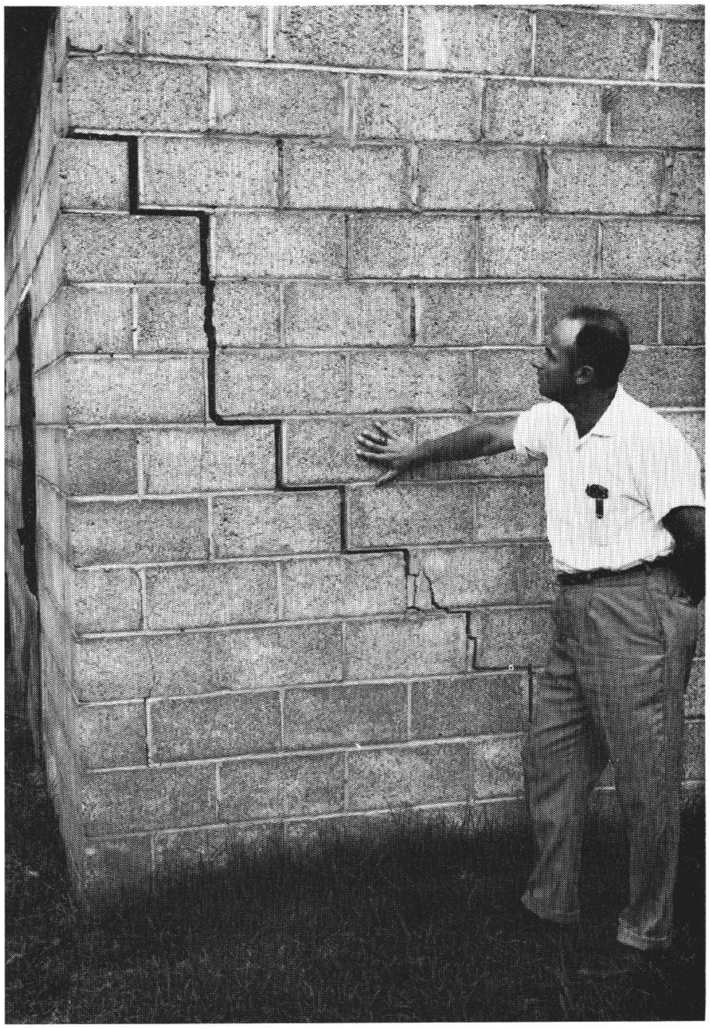

***Figure 7.*—Damage to building caused by shrinking and swelling of Kipling silty clay loam, 0 to 2 percent slopes.**

Engineering interpretations of the soils

Table 6 contains selected information useful to engineers and others who plan to use soil material in construction of highways, farm facilities, buildings, and drainage and irrigation systems. Detrimental or undesirable features were emphasized; but important desirable features may also be listed. The ratings and other interpretations in this table were based on estimated engineering properties of the soils in table 5; on available test data, including those in table 7; and on field experience. While, strictly, the information applies only to soil depths indicated in table 5, it is reasonably reliable to depths of about 5 to 6 feet for most soils. In Oktibbeha County difficulties in highway construction are caused mainly by characteristics of the soil material, by drainage, and in the eastern part of the county, by depth to the firm chalk.

In table 6 the suitability of soils for topsoil is rated good, fair, or poor. Topsoil is soil material useful for topdressing roadbanks, lawns, gardens, and other areas where vegetation is to be established and maintained. Important in rating suitability of soil material for use as topsoil is the productivity of the soil, the presence of coarse fragments, and the thickness of the material at its source.

The soils of Oktibbeha County are not rated as a source of sand or gravel. Although a few of the soils, mostly in the western part of the county, are a good to fair source of sand, they are generally not suitable. There is no suitable source of gravel in Oktibbeha County.

Road fill is the soil material used for building up road grades and is the material that supports the base layers. The properties important in evaluating soil material for use as road fill are shrink-swell potential, traffic supporting capacity, inherent erodibility, wetness, and thickness of the material at its source. In table 6 the soils in Oktibbeha County are rated good, fair, and poor as a source of road fill. Ruston soils are rated good to fair because shrink-swell is usually low, traffic supporting capacity is good to fair, inherent erodibility is less than severe, and the material is thicker than 6 feet at its source. Brooksville soils are rated as poor because the shrink-swell potential is very high, traffic supporting capacity is poor, and inherent erodibility is very severe.

TABLE 5.—*Estimated physical and*

[An asterisk in the first column indicates that at least one mapping unit is made up of two or more kinds of soil. Because these soils may first column

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification
			USDA texture
	Inches	*Inches*	
Adaton: Ad	0	0–6	Silt loam
		6–19	Silty clay loam
		19–60	Silty clay loam
Binnsville	>40	0–8	Silty clay loam
		8–40	Chalk.
Boswell: BoB	18	0–5	Fine sandy loam
		5–65	Silty clay
Brooksville: BrA, BrB	12	0–25	Silty clay
		25–52	Clay
Catalpa: Cp	12	0–20	Silty clay loam
		20–35	Clay loam; clay
		35–52	Silty clay
Falkner: FaA, FaB	15	0–6	Silt loam
		6–27	Silty clay loam
		27–49	Silty clay or clay
		49–64	Clay
Freestone: FrA, FrB	12	0–5	Fine sandy loam
		5–15	Loam
		15–60	Clay loam
*Gullied land: GsE. Too variable to be rated. For Sumter part, see Sumter series.			
Houston: Ho	24	0–24	Silty clay
		24–64	Clay
*Kipling: KlA, KlB2, KlC2, KsF3. For Sumter part of KsF3, see Sumter series.	12	0–9	Silty clay loam
		9–54	Silty clay
		54–60	Chalk.
Leeper: Le	12	0–9	Silty clay loam; silty clay
		9–42	Clay; silty clay loam
		42–53	Clay loam
Longview: LoA, LoB	12	0–18	Silt loam
		18–55	Silt loam (fragipan)
		55–72	Silty clay loam
*Maben: MbC2, MbD2, MeD, MrF. For Ruston part of MrF, see Ruston series.	>60	0–5	Fine sandy loam
		5–23	Clay; clay loam
		23–41	Loam
		41–60	Fine sandy loam
Mantachie: Ms	12	0–60	Loam
Marietta: Mt	24	0–6	Fine sandy loam
		6–55	Sandy clay loam
Mathiston: Mu	12	0–6	Silt loam
		6–39	Silt loam
		39–52	Silty clay loam
Myatt: My	0	0–10	Silt loam
		10–60	Silt loam

chemical properties of soils

have different properties and limitations, it is necessary to follow carefully the instructions for referring to other series that appear in the of this table]

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 10	No. 40	No. 200				
					Inches per hour	*Inches per inch of soil*	*pH*	
ML	A-4	100	90–100	70–90	0. 63–2. 00	0. 20–0. 22	4. 5–5. 5	Low.
ML, CL	A-7 or A-6	100	95–100	85–95	0. 20–0. 63	0. 20–0. 22	4. 5–5. 5	Moderate.
CL	A-7	100	95–100	85–95	0. 06–0. 20	0. 20 0. 22	4. 5–5. 5	Moderate.
CH	A-7	100	95–100	85–95	0. 06–0. 20	0. 10–0. 15	7. 4–8. 4	High.
SM, ML	A-4	100	75–85	40–55	0. 63–2. 00	0. 10–0. 15	4. 5–5. 5	Low.
CH	A-7	100	95–100	75–95	<0. 06	0. 15–0. 20	4. 0–5. 5	High.
CH	A-7	100	95–100	90–100	0. 06–0. 20	0. 18–0. 20	5. 6–6. 5	Very high.
CH	A-7	100	90–100	85–95	<0. 06	0. 15–0. 20	6. 5–8. 4	Very high.
CH	A-7	100	95–100	90–100	0. 06–0. 20	0. 19–0. 22	6. 1–7. 5	High.
CH	A-7	100	90–100	75–85	0. 06–0. 20	0. 15–0. 20	6. 1–8. 4	High.
CH	A-7	100	95–100	85–95	0. 06–0. 20	0. 18–0. 20	6. 1–8. 4	High.
ML	A-4	100	90–100	70–90	0. 63–2. 00	0. 20–0. 22	4. 5–5. 5	Low.
ML, CL	A-6	100	95–100	90–100	0. 63–2. 00	0. 19–0. 22	4. 5–5. 5	Low to moderate.
CH	A-7	100	95–100	90–100	0. 06–0. 20	0. 16–0. 18	4. 5–5. 5	High.
CH	A-7	100	90–100	90–100	0. 06–0. 20	0. 15–0. 20	4. 5–5. 5	High.
SM, ML	A-4	100	75–85	40–55	0. 63–2. 00	0. 10–0. 15	4. 5–5. 5	Low.
ML	A-6	100	80–90	60–75	0. 20–0. 63	0. 10–0. 15	4. 5–5. 5	Low.
CL	A-6	100	90–100	70–80	0. 06–0. 20	0. 12–0. 18	4. 5–5. 5	Moderate.
CH	A-7	100	95–100	85–95	0. 00–0. 20	0. 15–0. 20	6. 6–7. 5	Very high.
CH	A-7	100	90–100	85–95	<0. 06	0. 15–0. 20	6. 6–8. 4	Very high.
CL	A-7, A-6	100	95–100	85–95	0. 20–0. 63	0. 20–0. 22	4. 5–5. 5	Moderate.
CH	A-7	100	95–100	85–95	0. 00–0. 20	0. 19–0. 21	4. 5–7. 3	High.
CH	A-7	100	95–100	85–95	0. 20–0. 63	0. 20–0. 22	5. 6–8. 4	Moderate.
CH	A-7	100	95–100	85–95	0. 06–0. 20	0. 18–0. 20	5. 6–8. 4	High.
CH	A-7	100	90–100	85–95	0. 06–0. 20	0. 15–0. 20	7. 4–8. 4	High.
ML	A-4	100	90–100	70–95	0. 63–2. 00	0. 15–0. 20	4. 5–5. 5	Low.
ML, CL	A-6	100	90–100	70–90	0. 06–0. 20	0. 05–0. 10	4. 5–5. 5	Low.
CH	A-7	100	95–100	85–95	0. 06–0. 20	0. 10–0. 15	4. 5–5. 5	Moderate.
SM, ML	A-4	100	75–85	40–55	0. 63–2. 00	0. 10–0. 15	4. 5–6. 5	Low.
CH, CL	A-7	100	90–100	75–85	0. 20–0. 63	0. 15–0. 20	4. 5–6. 5	Moderate.
ML, CL	A-6	100	80–90	60–75	0. 20–0. 63	0. 10–0. 15	4. 5–6. 5	Low.
SM-ML	A-4	100		40–55	0. 63–2. 00	0. 10–0. 15	4. 5–6. 5	Low.
ML	A-4	100	80–90	60–75	0. 63–2. 00	0. 14–0. 18	4. 5–5. 5	Low.
ML, SM	A-4	100	75–85	40–55	0. 63–2. 00	0. 10–0. 15	5. 6–8. 4	Low.
SC	A-6	100	85–95	35–50	0. 63–2. 00	0. 15–0. 20	5. 6–8. 4	Low to moderate.
ML	A-4	100	90–100	70–90	0. 63–2. 00	0. 20–0. 23	4. 5–5. 5	Low.
ML, CL	A-6	100	90–100	80–90	0. 63–2. 00	0. 20–0. 23	4. 5–5. 5	Low to moderate.
CL	A-7	100	95–100	85–95	0. 63–2. 00	0. 20–0. 23	4. 5–5. 5	Moderate.
ML	A-4	100	90–100	70–90	0. 63–2. 00	0. 08–0. 20	4. 5–5. 5	Low.
ML	A-4	100	90–100	70–90	0. 20–0. 63	0. 10–0. 20	4. 5–5. 5	Low.

TABLE 5.—*Estimated physical and*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification: USDA texture
	Inches	*Inches*	
Ochlockonee: Oc	>30	0–7	Loam
		7–28	Silt loam
		28–52	Loam
Oktibbeha: OlB2, OlC2, OtE3	>24	0–4	Silty clay
		4–34	Clay or silty clay
		34–45	Clay
		45–60	Very firm chalk.
Oktibbeha series, thick solum variant: OhC2	>24	0–9	Fine sandy loam
		9–55	Clay; clay loam
Prentiss: PnA, PnB	20	0–23	Silt loam
		23–52	Silt loam (fragipan)
		52–60	Silty clay loam (fragipan)
Providence: PsB2, PsC2, PsC3	20	0–4	Silt loam
		4–21	Silty clay loam
		21–45	Silty clay loam (fragipan)
		45–60	Silty clay loam
*Ruston: RtB, RuE. For Maben part of RuE, see Maben series.	>60	0–15	Fine sandy loam
		15–32	Sandy clay loam
		32–55	Sandy loam; loam
		55–80	Loam; sandy loam
Savannah: SaB2, SaC2, SaD2	20	0–4	Fine sandy loam
		4–22	Loam
		22–60	Loam; sandy clay loam
Sessum: Se	0	0–6	Silty clay loam
		6–58	Clay
		58–85	Clay
Stough: St	12	0–8	Fine sandy loam
		8–18	Loam
		18–47	Loam (fragipan)
		47–60	Loam (fragipan)
*Sumter: SuC2, SuD2, SvB2, SvC2. For Binnsville part of SvB2 and SvC2, see Binnsville series.	>30	0–5	Silty clay loam
		5–20	Silty clay
		20–34	Marly clay
		34–60	Chalk.
Urbo: Ur	12	0–5	Silty clay loam
		5–55	Silty clay
Wilcox: WcA, WlB2, WlC2, WlD2, WlF2	12	0–4	Silty clay loam
		4–8	Silty clay
		8–42	Clay
		42–60	Shaly clay

chemical properties of soils—Continued

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 10	No. 40	No. 200				
					Inches per hour	*Inches per inch of soil*	*pH*	
ML	A-4	100	80-90	60-75	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
SM	A-4	100	60-70	40-50	0. 63-2. 00	0. 09-0. 12	4. 5-5. 5	Low.
ML	A-4	100	80-90	60-75	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
CL-CH	A-6	100	95-100	80-95	0. 20-0. 63	0. 15-0. 20	4. 5-5. 5	Low to moderate.
CH	A-7	100	95-100	85-95	0. 00-0. 20	0. 15-0. 20	4. 5-5. 5	High.
CH	A-7	70	60-80	70-95	0. 00-0. 20	0. 15-0. 20	6. 1-8. 4	High.
SM, ML	A-4	100	75-90	40-55	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
CH	A-7	100	90-100	75-95	0. 00-0. 20	0. 15-0. 20	4. 5-5. 5	Moderate to high.
ML	A-4	100	90-100	70-85	0. 63-2. 00	0. 10-0. 20	4. 5-5. 5	Low.
ML	A-4	100	90-100	70-85	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Low.
ML, CL	A-6	100	95-100	80-90	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Low.
ML	A-4	100	90-100	70-90	0. 63-2. 00	0. 20-0. 22	4. 5-5. 5	Low.
CL	A-6, A-7	100	95-100	85-95	0. 63-2. 00	0. 20-0. 22	4. 5-5. 5	Moderate.
ML, CL	A-6	100	95-100	85-95	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Moderate.
CH	A-7	100	95-100	85-100	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Moderate to high.
SM, ML	A-4	100	70-80	40-55	0. 63-2. 00	0. 14-0. 16	4. 5-6. 0	Low.
SC, CL	A-6	100	75-85	35-55	0. 63-2. 00	0. 15-0. 17	4. 5-6. 0	Low.
SM	A-4, A-2	100	65-85	30-40	0. 63-2. 00	0. 10-0. 15	4. 5-6. 0	Low.
ML, CL	A-4, A-6	100	65-85	60-75	0. 63-2. 00	0. 14-0. 16	4. 5-6. 0	Low.
SM, ML	A-4	100	75-85	40-55	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
ML	A-6	100	80-90	60-75	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
ML	A-6	100	85-95	60-75	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Low.
CH	A-7	100	95-100	85-95	0. 06-0. 20	0. 15-0. 20	4. 5-6. 0	Very high.
CH	A-7	100	90-100	90-100	$<$0. 06	0. 15-0. 20	4. 5-6. 0	Very high.
CH	A-7	100	90-100	90-100	$<$0. 06	0. 15-0. 20	6. 0-8. 4	Very high.
SM, ML	A-4	100	70-80	40-55	0. 63-2. 00	0. 13-0. 15	4. 5-5. 5	Low.
ML	A-4	100	80-90	60-75	0. 63-2. 00	0. 15-0. 17	4. 5-5. 5	Low.
ML	A-4	100	80-90	60-75	0. 20-0. 63	0. 10 0. 12	4. 5-5. 5	Low.
ML-CL	A-4	100	80-90	70-85	0. 20-0. 63	0. 10-0. 12	4. 5-5. 5	Low.
ML-CL	A-6	100	95-100	85-95	0. 20-0. 63	0. 15-0. 20	7. 4-8. 4	High.
CL	A-7	100	95-100	90-95	0. 06-0. 20	0. 12-0. 17	7. 4-8. 4	High.
CH	A-7	100	90-100	90-95	0. 06-0. 20	0. 12-0. 17	7. 4-8. 4	High.
ML, CL	A-6, A-7	100	95-100	85-95	0. 20-0. 63	0. 15-0. 20	4. 5-5. 5	High.
CH	A-7	100	95-100	90-95	$<$0. 06	0. 15-0. 20	4. 5-5. 5	High to very high.
CL	A-7	100	95-100	85-95	0. 06-0. 20	0. 15-0. 20	4. 5-5. 5	Moderate.
CH	A-7	100	95-100	90-95	0. 06-0. 20	0. 15-0. 20	4. 5-5. 5	High to very high.
CH	A-7	100	90-100	80-95	$<$0. 06	0. 15-0. 20	4. 0-5. 5	Very high.
CH	A-7	80-90	75-85	60-90	$<$0. 06	0. 15-0. 20	4. 0-5. 5	High.

TABLE 6.—*Interpretations*

[An asterisk in the first column indicates that at least one mapping unit is made up of two or more kinds of soil. Because these soils may first column

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Dikes or levees
Adaton: Ad	Fair	Poor: poor traffic supporting capacity; wetness.	Nearly level; slow internal movement of water; wetness.	Fair strength and stability
Binnsville	Poor	Poor: 20 inches or less to firm chalk; high shrink-swell potential.	20 inches or less to firm chalk.	20 inches or less to firm chalk; high shrink-swell potential.
Boswell: BoB	Fair	Poor: high shrink-swell potential.	High shrink-swell potential	Very slow permeability; subject to cracking when dry.
Brooksville: BrA, BrB	Poor	Poor: very high shrink-swell potential.	Nearly level to gently sloping; plastic clays; very high shrink-swell potential.	Very high shrink-swell potential; fair slope stability; high compressibility.
Catalpa: Cp	Poor	Poor: high shrink-swell potential.	Flood plain; subject to flooding; high shrink-swell potential.	Cracks when dry; difficult to pack properly.
Falkner: FaA, FaB	Fair	Poor: underlain by clay with high shrink-swell potential.	Level to gently sloping; underlain by plastic clay; high water table.	Fair to low strength and stability; high shrink-swell potential in lower subsoil.
Freestone: FrA, FrB	Fair	Fair: fair traffic supporting capacity.	Underlying soil material has moderate shrink-swell potential.	Slow permeability; fair stability and strength.
*Gullied land: GsE. Gullied land too variable to estimate. For Sumter part, see Sumter series.				
Houston: Ho	Poor	Poor: very high shrink-swell potential.	Nearly level slopes; very high shrink-swell potential.	Cracks when dry, very slowly permeable when moist.

of engineering properties

have different properties and limitations, it is necessary to follow carefully the instructions for referring to other series that appear in the of this table]

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankment				
Slow seepage rate	Fair strength and stability; slow seepage rate.	Needs surface drainage; poorly drained.	Slow intake rate; slow permeability.	Nearly level; no erosion hazard.	Very high available water capacity.
20 inches or less to firm chalk; subject to seepage.	20 inches or less to firm chalk; high shrink-swell potential.	Not needed; well drained; slopes.	Slow intake rate; slow permeability.	Firm chalk at a depth of 20 inches or less.	Low available water capacity.
Very slow permeability.	Very slow permeability; subject to cracking when dry.	Not needed; moderately well-drained; slopes.	Moderate to slow intake rate; very slow permeability.	Clayey subsoil; difficult to construct.	High available water capacity.
Very slow permeability; will support deep water.	Very high shrink-swell potential; subject to seepage.	Needs surface drainage on nearly level slopes; somewhat poorly drained.	High initial infiltration rate when cracked; infiltration slows as soil is moistened; very slow permeability.	Clayey subsoil; difficult to construct.	Plastic clays; easy to vegetate.
Slow permeability; will support deep water.	Cracks when dry; difficult to pack properly; subject to seepage.	Needs surface drainage; water ponds on nearly level slopes.	High initial infiltration rate; slows as soil is moistened.	Nearly level; no erosion hazard.	Plastic clays; easy to vegetate.
Slow seepage rate; slow permeability.	Low to fair strength and stability; high shrink-swell potential in lower subsoil.	Needs surface drainage on nearly level slopes; somewhat poorly drained.	Slow intake rate; moderate permeability above the clay.	Nearly level to gently sloping; underlain by clay.	High available water capacity; grows fairly good sod.
Slow permeability in lower subsoil.	Fair strength and stability; slow permeability in lower subsoil.	Needs surface drainage on nearly level slopes; slow permeability; water ponds.	Moderate to slow intake rate; moderately slow permeability in upper subsoil; slow in lower subsoil.	Nearly level to gently sloping; easy to construct.	Medium available water capacity; grows fairly good sod.
Very slow permeability; will support deep water.	Cracks when dry; difficult to pack properly; subject to seepage.	Needs surface drainage on nearly level slopes; very slow permeability; water ponds.	High initial intake rate when cracked; decreasing intake rate as the soil becomes moist.	Clayey subsoil; difficult to construct.	Plastic clays; grows good sod.

TABLE 6.—*Interpretations*

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Dikes or levees
*Kipling: KlA, KlB2, KlC2, KsF3. For Sumter part of KsF3, see Sumter series.	Poor	Poor: high shrink-swell potential.	Nearly level to moderately sloping; plastic clays; high shrink-swell potential.	High shrink-swell potential; cracks when dry.
Leeper: Le	Poor	Poor: high shrink-swell potential.	Flood plain; high shrink-swell potential.	Cracks when dry; slowly permeable when moist.
Longview: LoA, LoB	Fair	Fair: fair traffic supporting capacity; wetness.	Perched water table; drainage impeded by fragipan.	Moderate to slow permeability; fair to good stability and strength.
*Maben: MbC2, MbD2, MeD, MrF. For Ruston part of MrF, see Ruston series.	Fair	Fair: moderate shrink-swell potential.	Moderate shrink-swell potential in upper subsoil.	Moderately slow permeability; fair stability and strength.
Mantachie: Ms	Good	Fair: fair traffic supporting capacity; wetness.	High water table; subject to flooding.	Moderate permeability; fair strength and stability.
Marietta: Mt	Fair	Fair: fair traffic supporting capacity.	Flood plain; subject to flooding.	Fair strength and stability.
Mathiston: Mu	Fair	Fair: fair traffic supporting capacity.	High water table; subject to flooding.	Moderate permeability; fair strength and stability.
Myatt: My	Fair	Fair: fair strength and stability.	Seasonal high water table at the surface.	Moderately slow permeability; fair stability and strength.
Ochlockonee: Oc	Good	Good to fair: fair traffic supporting capacity.	Subject to flooding.	Moderate permeability; fair strength and stability.
Oktibbeha: OlB2, OlC2, OtE3	Poor	Poor: high shrink-swell potential.	High shrink-swell potential.	High shrink-swell potential.
Oktibbeha series, thick solum variant: OhC2.	Fair	Poor: moderate to high shrink-swell potential.	Moderate to high shrink-swell potential.	Slow to very slow permeability; moderate to high shrink-swell potential.

of engineering properties—Continued

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankment				
Slow to very slow permeability; will support deep water.	Cracks when dry; subject to seepage; difficult to pack properly.	Needs surface drainage on nearly level slopes; somewhat poorly drained.	High initial intake rate when cracked; decreasing intake rate as the soil becomes moist.	Clayey subsoil; difficult to construct.	Plastic clays; grows good sod.
Slowly permeable; will support deep water.	Cracks when dry; difficult to pack properly; subject to seepage.	Needs surface drainage; somewhat poorly drained.	High initial intake rate when cracked; decreasing intake rate as the soil becomes moist.	Nearly level; no erosion hazard.	Plastic clays; grows good sod.
Moderate permeability above the fragipan; slow in the fragipan.	Fair to good strength and stability.	Needs surface drainage; drainage difficult due to fragipan.	Slow intake rate; moderate permeability above fragipan.	Soil properties favorable; easy to construct.	Medium available water capacity; grows good sod when fertilized.
Subject to seepage in some areas.	Fair strength and stability.	Not needed; well drained; slopes.	Moderate intake rate; moderately slow permeability.	Soil properties favorable on moderate slopes; easy to construct.	Medium to high available water capacity.
Moderate permeability; chance of seepage.	Fair strength and stability.	Needs surface drainage; high water table; somewhat poorly drained.	Moderate intake rate and moderate permeability.	Nearly level; no erosion hazard.	Medium to high available water capacity.
Subject to excess seepage in some areas.	Moderate permeability; fair strength and stability.	Needs surface drainage; nearly level slopes; subject to flooding.	Moderate intake rate and moderate permeability.	Nearly level; no erosion hazard.	Grows good sod; high available water capacity.
Moderate permeability.	Fair strength and stability.	Needs surface drainage; high water table.	Slow intake rate; moderate permeability.	Nearly level; no erosion hazard.	High water table; very high available water capacity.
Moderately slow permeability; high water table.	Fair strength and stability.	Needs surface drainage; high water table.	Moderate to slow intake rate; moderately slow permeability.	Nearly level; no erosion hazard.	High water table; grows good sod when fertilized.
Subject to excessive seepage in some areas.	Fair strength and stability; some seepage likely.	Needs surface drainage; nearly level slopes; subject to flooding.	Moderate intake rate and moderate permeability.	Nearly level; no erosion hazard.	Medium available water capacity; grows good sod.
Very slow to slow permeability; will support deep water.	Fair to low strength and stability; cracks when dry.	Not needed; moderately well drained; slopes.	High initial intake rate when cracked; decreasing intake rate as soil becomes moist.	Clayey subsoil; difficult to construct.	Plastic clays; sod sometimes difficult to establish, but grows well.
Very slow to slow permeability; will support deep water.	Fair to low strength and stability.	Not needed; moderately well drained; slopes.	Moderate intake rate; slow to very slow permeability.	Clayey subsoil; difficult to construct.	Sod sometimes difficult to establish but grows well.

TABLE 6.—*Interpretations*

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Dikes or levees
Prentiss: PnA, PnB	Fair to good.	Fair: fair traffic supporting capacity.	Fragipan causes perched water table.	Moderate permeability above fragipan; good stability.
Providence: PsB2, PsC2, PsC3	Fair	Fair: fair traffic supporting capacity.	Fragipan causes perched water table.	Moderate permeability above fragipan; fair strength and stability.
*Ruston: RtB, RuE For Maben part of RuE see Maben series.	Fair	Fair to good: fair traffic supporting capacity.	Soil properties favorable; gently to very steeply sloping.	Fair to good stability and strength.
Savannah: SaB2, SaC2, SaD2	Fair	Fair: fair traffic supporting capacity.	Fragipan causes perched water table; fair traffic supporting capacity.	Fair to good stability and strength.
Sessum: Se	Poor	Poor: very high shrink-swell potential.	Poorly drained; clay with very high shrink-swell potential.	Cracks when dry; very slow permeability when moist.
Stough: St	Fair	Fair: fair traffic supporting capacity.	Perched water table; drainage impeded by fragipan.	Fair stability and strength.
*Sumter: SuC2, SuD2, SvB2, SvC2 For Binnsville part of SvB2 and SvC2 see Binnsville series.	Poor	Poor: high shrink-swell potential.	Plastic clays over marl or chalk; high shrink-swell potential.	Plastic clays over marl or chalk.
Urbo: Ur	Poor	Poor: high shrink-swell potential.	High water table; high shrink-swell potential; subject to flooding.	Very slow permeability; high shrink-swell potential.
Wilcox: WcA, WlB2, WlC2, WlD2, WlF2.	Poor	Poor: very high shrink-swell potential.	Very high shrink-swell potential.	Very slow permeability; very high shrink-swell potential.

of engineering properties—Continued

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankment				
Excessive seepage in some areas below fragipan.	Fair strength and stability; piping and erosion.	Needs surface drainage on nearly level slopes; perched water table.	Moderate to slow intake rate; moderate permeability above fragipan; medium available water capacity.	Soil properties favorable; easy to construct.	Medium available water capacity.
Moderately slow permeability in fragipan and lower horizons.	Fair strength and stability; piping and erosion.	Not needed; moderately well drained; slopes.	Slow intake rate; moderate permeability above the fragipan.	Fragipan at 27 inches; soil properties favorable; easy to construct.	Medium available water capacity.
Excessive seepage in some areas.	Fair to good strength and stability.	Not needed; well drained; slopes.	High intake rate; moderate permeability and medium available water capacity.	Soil properties favorable on moderate slopes; easy to construct.	Grows good sod when fertilized; medium available water capacity.
Excessive seepage in some areas below fragipan.	Fair to good strength and stability.	Not needed; moderately well drained; slopes.	Moderate intake rate; moderately slow permeability; medium available water capacity.	Soil properties favorable; easy to construct.	Medium available water capacity; easy to vegetate.
Very slow permeability; will support deep water.	Cracks when dry; difficult to pack properly; subject to seepage.	Needs surface drainage on nearly level slopes; poorly drained.	High initial intake rate when cracked; decreasing intake rate as the soil becomes moist.	Clayey subsoil; difficult to construct.	Plastic clays; grows good sod.
Moderately slow permeability in fragipan.	Fair strength and stability; piping and erosion.	Needs surface drainage; somewhat poorly drained; perched water table.	Moderate to slow intake rate and moderate permeability above the fragipan.	Nearly level slopes; soil properties favorable; easy to construct.	Medium available water capacity; grows good sod when fertilized.
Plastic clays over marl or chalk.	Difficult to pack; subject to excessive seepage.	Not needed; well drained; slopes.	High initial intake rate when cracked; decreasing intake rate as the soil becomes moist.	Marl or chalk about 20 inches beneath surface.	Upper 20 inches grows good sod; plastic clay over marl or chalk.
Very slow permeability; will support deep water.	High shrink-swell potential; subject to excessive seepage.	Needs surface drainage; high water table; somewhat poorly drained.	Slow intake rate; very slow permeability.	Nearly level slopes; no erosion hazard.	High water table; high available water capacity.
Very slow permeability; will support deep water.	Very slow permeability; cracks when dry; very high shrink-swell potential.	Needs drainage on nearly level slopes; somewhat poorly drained.	Slow intake rate; very slow permeability.	Clayey subsoil; difficult to construct.	High available water capacity.

TABLE 7.—*Engineering*

[Tests performed by Mississippi State Highway Department, in cooperation with the Bureau of Public Roads, U.S. Department of

Soil name and location	Parent material	Mississippi State highway laboratory Nos.	Depth from surface	Moisture-density data[1]	
				Maximum dry density	Optimum moisture
			Inches	*Lb. per cu. ft.*	*Percent*
Longview silt loam, 4½ miles southwest of Starkville, NE1/4NW1/4 sec. 32, T. 18 N., R. 14 E.	Loamy material.	534160	55–72	101	20
		534159	18–26	106	17
Sumter silty clay loam, 330 yds. north of State Highway No. 25, 230 ft. west of Clay County line, SE1/4NE1/4 sec. 12, T. 19 N., R. 15 E.	Marly clay over chalk.	534155	8–20	99	21
		534156	34–60	96	24

[1] Moisture density according to AASHO Designation: T–99–57, Method A (*1*).
[2] Mechanical analysis according to AASHO Designation: T–88–57 (*1*); results by this procedure may differ from results obtained by the soil survey procedures of the Soil Conservation Service. In the AASHO procedure the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS procedure the fine material is analyzed by the pipette method, and material coarser than 2 millimeters is excluded

Some of the soil features that affect the location of highways are drainage, depth to bedrock, plasticity, or workability of the soil material when it is wet, and flooding hazard. From December through April, rainfall in the county averages more than 4 inches per month and is evenly distributed. Unless artificial means of drying are used, earthwork may be delayed because most of the soil materials dry out slowly. Also from December through April, the water table in most soils is at its highest level.

In this county, only Ruston, Maben, Savannah, and Prentiss soils are fairly well suited to grading or other earthwork in the winter and early spring. Earthwork is difficult in the fine textured subsoil of Kipling, Brooksville, Houston, Sessum, Sumter, and Wilcox soils because of plasticity and high or very high shrink-swell potential. Earthwork may be more expensive in the Binnsville and Sumter soils because of the shallowness to firm chalk or bedrock. A water table near the surface in the winter and early spring limits earthwork in the Longview, Adaton, Stough, Myatt, Mathiston, and Mantachie soils.

For long periods each year, water is ponded on or near the surface of the Adaton, Longview, and Myatt soils. Roads on these soils must be constructed on embankment sections or provided with an adequate system of underdrains and surface drains. Mathiston, Mantachie, Ochlockonee, Urbo, Leeper, Marietta, and Catalpa soils are subject to flooding. On these soils roads should be constructed on a continuous embankment that is several feet above the level of flooding.

Soil features that influence the suitability of soil material for use in dikes and levees are permeability, stability, shrink-swell potential, depth to bedrock or other firm layers, and ease of compaction. The use of Binnsville soils, for example, is affected by the shallowness to bedrock.

Some of the soil features that affect the use of soils as a reservoir area are susceptibility to seepage or to flooding, permeability, and the level of the water table. Providence soils, for example, are good as reservoir areas because they have a low rate of seepage and are able to hold water. The Ruston soils are poor to fair as reservoir areas because of excessive seepage in some places.

Important features that affect the suitability of soil material for embankments are strength and stability, shrink-swell potential, compactability, seepage, permeability, and erosiveness.

Soil features affecting agricultural drainage are topography, depth to water table, permeability, susceptibility to flooding, and availability of outlets.

Some of the features considered in evaluating a soil for irrigation purposes are rate of water intake, permeability, topography, available water capacity, and fertility.

Uniformity, length of slope, depth to bedrock or other unfavorable material, texture, permeability, and other properties of the soil material are to be considered when determining the suitability of a soil for terraces and diversions.

The factors considered for waterways are those features and qualities of soils that affect the establishment, growth, and maintenance of plants, and factors that hinder layout and construction. Such factors are available water capacity, depth to the water table, erodibility, strength and stability, topography, and suitability for grasses.

Soil test data

Samples of Longview silt loam and Sumter silty clay loam were tested according to standard procedures of the American Association of State Highway Officials (AASHO) (*1*). Table 7 gives the data obtained from these tests and the classification of each sample according to both the AASHO and the Unified systems.

These samples were tested for compaction (moisture-density). If a soil material is compacted at successively higher moisture content, assuming that the compactive *test data*

Commerce, in accordance with standard procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Mechanical analysis[2]							Liquid limit	Plasticity index	Classification	
Percentage passing sieve—			Percentage smaller than—							
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO	Unified[3]
							Percent			
100	99	89	85	67	40	23	53	34	A-7-6 (19)	CH
100	99	86	80	57	28	23	37	11	A-6 (8)	ML-CL
100	99	94	90	82	69	50	48	24	A-7-6 (15)	CL
100	100	94	89	83	73	53	51	27	A-7-6 (17)	CH

from calculations of grain-size fractions. The mechanical analysis data in this table are not suitable for use in determining textural classes for soils.

[3] Soil Conservation Service and Bureau of Public Roads have agreed to consider that all soils having plasticity indexes within two points of A-line are to be given a borderline classification. An example is ML-CL.

effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that point, the density decreases as the content of moisture increases. The highest dry density obtained in the compaction test is called maximum dry density.

Moisture-density data are important in earthwork, for as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

The engineering soil classifications in table 7 are based on data obtained from mechanical analysis and by tests to determine liquid limit and plastic limit. Mechanical analyses were made by the combined sieve and hydrometer methods. The percentage of clay obtained by the hydrometer method should not be used in naming the textural classes for soils.

The test for liquid limit and plastic limit measures the effect of water on the consistence of soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. The plastic limit is the moisture content at which the soil material passes from a semisolid to a plastic state.

As the moisture content is further increased, the material changes from a plastic to a liquid state, which is the liquid limit. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition. The AASHO and Unified classifications have been explained earlier in this section.

Use of Soils for Town and Country Planning

The desirability of soils for dwellings, campsites, picnic areas, intensive play areas, golf fairways, light industries, and trafficways is determined by appraising the properties of the soil in relation to the intended use. In table 8, the soils of Oktibbeha County are listed and their limitations for some of these uses are estimated. Dashes indicate that the soil conditions are too variable to make an estimate.

Limitations for dwellings of 3 stories or less are slight if (1) shrink-swell potential is very low to low; (2) the water table is below a depth of 40 inches; (3) flooding is not a hazard; (4) slopes are 0 to 5 percent; and (5) a fragipan, claypan, or bedrock is not above a depth of 50 inches.

Limitations for dwellings are moderate if any one of the following is applicable: (1) the shrink-swell potential is moderate; (2) the water table is at a depth of 15 to 40 inches; (3) flooding is not a hazard; (4) slopes are 5 to 15 percent; (5) a fragipan or claypan is at a depth of 20 to 36 inches.

Limitations for dwellings are severe if any one of the following apply: (1) the shrink-swell potential is high to very high; (2) the water table is at a depth of less than 15 inches; (3) the soil is subject to flooding; (4) slopes are 15 percent or more; and (5) a fragipan or claypan is generally at a depth of less than 20 inches.

Limitations of soils used for septic tank filter fields are slight if (1) permeability is rapid or the upper end of moderate; (2) the water table is below a depth of 4 feet; (3) flooding is not a hazard; (4) slopes are 0 to 5 percent; and (5) depth to a restricted layer is more than 6 feet.

Limitations for septic tank filter fields are moderate if any one of the following apply: (1) permeability is the lower end of moderate; (2) the water table is 2 to 4 feet below the surface; (3) flooding is not more often than once in 5 years; (4) slopes are 5 to 12 percent; and (5) depth to a restricted layer is from 4 to 6 feet.

Limitations for septic tank filter fields are severe if any one of the following apply: (1) permeability is moderately slow or very slow; (2) the water table is less than 2 feet below the surface; (3) flooding is more often than once in 5 years; (4) slopes are more than 12 percent; and (5) a fragipan or claypan is at a depth of less than 4 feet.

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TABLE 8.—*Degree of limitation of*

[Dashes indicate soil properties are too

Soil series and map symbols	Dwellings with—		Recreational uses
	Public or community sewage systems	Septic tank filter fields	Campsites
Adaton: Ad	Severe: moderate shrink-swell potential; high water table.	Severe: moderate shrink-swell potential; slow permeability.	Severe: excess wetness
Boswell: BoB	Severe: high shrink-swell potential.	Severe: high shrink-swell potential; very slow permeability.	Moderate: fair trafficability.
Brooksville: BrA, BrB	Severe: very high shrink-swell potential.	Severe: very high shrink-swell potential; very slow permeability.	Severe: poor trafficability.
Catalpa: Cp	Severe: subject to flooding; high shrink-swell potential.	Severe: subject to flooding; high shrink-swell potential.	Severe: poor trafficability.
Falkner: FaA, FaB	Severe: excess wetness; high shrink-swell potential.	Severe: slow permeability; high shrink-swell potential.	Moderate: excess wetness; fair trafficability.
Freestone: FrA, FrB	Severe: excess wetness; moderate shrink-swell potential.	Severe: slow permeability; moderate shrink-swell potential.	Moderate: excess wetness; fair trafficability.
Gullied land: GsE	---	---	---
Houston: Ho	Severe: very high shrink-swell potential.	Severe: very high shrink-swell potential; very slow permeability.	Severe: poor trafficability.
Kipling: KlA, KlB2, KlC2	Severe: high shrink-swell potential.	Severe: slow to very slow permeability; high shrink-swell potential.	Severe: clayey surface; poor trafficability.
KsF3	Severe: high shrink-swell potential; 17 to 40 percent slopes.	Severe: slow to very slow permeability; high shrink-swell potential; 17 to 40 percent slopes.	Severe: poor trafficability; 17 to 40 percent slopes.
Leeper: Le	Severe: subject to flooding; high shrink-swell potential.	Severe: subject to flooding; slow permeability; high shrink-swell potential.	Severe: poor trafficability.
Longview: LoA, LoB	Severe: excess wetness	Severe: perched water table; excess wetness; slow permeability.	Moderate: excess wetness.
Maben: MbC2, MbD2	Moderate: 5 to 12 percent slopes.	Severe: moderately slow permeability.	Slight: 5 to 8 percent slopes. Moderate: 8 to 12 percent slopes.
MeD	Moderate: 8 to 12 percent slopes.	Severe: moderately slow permeability.	Moderate: 8 to 12 percent slopes.
MrF	Severe: slope greater than 12 percent.	Severe: slope greater than 12 percent.	Severe: 12 to 30 percent slopes.
Mantachie: Ms	Severe: subject to flooding; seasonally high water table.	Severe: subject to flooding; seasonally high water table.	Severe: subject to flooding.

soils for town and country planning

variable to be rated]

Recreational uses—Continued		Light industries	Trafficways
Picnic areas	Intensive play areas		
Severe: excess wetness	Severe: excess wetness	Severe: excess wetness; moderate shrink-swell potential.	Severe: excess wetness.
Moderate: fair trafficability	Moderate: fair trafficability; slope 2 to 5 percent.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Severe: poor trafficability	Severe: poor trafficability	Severe: very high shrink-swell potential.	Severe: very high shrink-swell potential.
Severe: poor trafficability	Severe: poor trafficability	Severe: subject to flooding; high shrink-swell potential.	Severe: subject to flooding; high shrink-swell potential.
Moderate: excess wetness; fair trafficability.	Moderate to severe: excess wetness.	Severe: high shrink-swell potential.	Severe: excess wetness; high shrink-swell potential.
Moderate: excess wetness; fair trafficability.	Moderate to severe: excess wetness.	Severe: excess wetness; moderate shrink-swell potential.	Severe: excess wetness; moderate shrink-swell potential.
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Severe: poor trafficability	Severe: poor trafficability; very slow permeability.	Severe: very high shrink-swell potential.	Severe: very high shrink-swell potential.
Severe: poor trafficability	Severe: poor trafficability; slow to very slow permeability.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Severe: poor trafficability; 17 to 40 percent slopes.	Severe: poor trafficability; 17 to 40 percent slopes.	Severe: high shrink-swell potential; 17 to 40 percent slopes.	Severe: high shrink-swell potential; 17 to 40 percent slopes.
Severe: poor trafficability	Severe: slow permeability	Severe: subject to flooding; high shrink-swell potential.	Severe: subject to flooding; high shrink-swell potential.
Moderate: excess wetness; fair trafficability.	Moderate: excess wetness	Severe: excess wetness	Severe: excess wetness; perched water table.
Slight: 5 to 8 percent slopes. Moderate: 8 to 12 percent slopes.	Severe: moderately slow permeability; slope greater than 5 percent.	Moderate: 5 to 8 percent slopes. Severe: 8 to 12 percent slopes.	Moderate: fair to poor traffic supporting capacity.
Moderate: 8 to 12 percent slopes.	Severe: moderately slow permeability; 8 to 12 percent slopes.	Severe: 8 to 12 percent slopes.	Moderate: fair to poor trafficability.
Severe: 12 to 30 percent slopes.	Severe: slope of 12 to 30 percent.	Severe: slope of 12 to 30 percent.	Moderate: 12 to 17 percent slopes. Severe: 17 to 30 percent slopes.
Moderate: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; seasonally high water table.	Severe: seasonally high water table; subject to flooding.

TABLE 8.—*Degree of limitation of*

Soil series and map symbols	Dwellings with— Public or community sewage systems	Dwellings with— Septic tank filter fields	Recreational uses Campsites
Marietta: Mt	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.
Mathiston: Mu	Severe: seasonally high water table: subject to flooding.	Severe: subject to flooding; seasonally high water table.	Severe: subject to flooding.
Myatt: My	Severe: high water table; excess wetness.	Severe: high water table; excess wetness.	Severe: excess wetness; may flood.
Ochlockonee: Oc	Severe: subject to flooding.	Severe: subject to flooding.	Moderate to severe: subject to flooding.
Oktibbeha:			
OlB2, OlC2	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.	Moderate: slow to very slow permeability.
OtE3	Severe: high shrink-swell potential.	Severe: slow to very slow permeability; high shrink-swell potential.	Moderate: fair trafficability; 8 to 12 percent slopes. Severe: 12 to 17 percent slopes.
Oktibbeha, thick solum variant: OhC2	Severe: moderate to high shrink-swell potential.	Severe: slow to very slow permeability; moderate to high shrink-swell potential.	Moderate: fair trafficability.
Prentiss: PnA, PnB	Moderate: perched water table.	Severe: moderately slow permeability; perched water table.	Slight.
Providence:			
PsB2	Moderate: moderate to high shrink-swell potential.	Severe: moderately slow permeability; moderate to high shrink-swell potential.	Slight.
PsC2	Moderate: moderate to high shrink-swell potential.	Severe: moderately slow permeability; moderate to high shrink-swell potential.	Slight.
PsC3	Moderate: moderate to high shrink-swell potential.	Severe: moderately slow permeability; moderate to high shrink-swell potential.	Slight.
Ruston:			
RtB	Slight.	Slight.	Slight.
RuE	Severe: 12 to 30 percent slopes.	Severe: 12 to 30 percent slopes.	Severe: greater than 12 percent slope.
Savannah: SaB2, SaC2, SaD2	Moderate: perched water table.	Severe: perched water table; moderately slow permeability.	Slight: slopes less than 8 percent. Moderate: slopes more than 8 percent.
Sessum: Se	Severe: very high shrink-swell potential.	Severe: very slow permeability; very high shrink-swell potential.	Severe: excess wetness.

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Recreational uses—Continued: Picnic areas	Recreational uses—Continued: Intensive play areas	Light industries	Trafficways
Moderate: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; seasonally high water table.	Severe: seasonally high water table; subject to flooding.
Moderate: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; seasonally high water table.	Severe: subject to flooding; seasonally high water table.
Moderate: excess wetness; may flood.	Severe: excess wetness; may flood.	Severe: high water table; excess wetness.	Severe: high water table; excess wetness.
Moderate: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.
Moderate: fair trafficability.	Severe: slow to very slow permeability.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Moderate: fair trafficability; 8 to 12 percent slopes. Severe: 12 to 17 percent slopes.	Severe: slow to very slow permeability; 8 to 17 percent slopes.	Severe: high shrink-swell potential; 8 to 17 percent slopes.	Severe: high shrink-swell potential.
Moderate: fair trafficability.	Severe: slow to very slow permeability.	Severe: moderate to high shrink-swell potential.	Severe: moderate to high shrink-swell potential.
Slight.	Moderate: moderately slow permeability.	Moderate: moderate bearing strength.	Moderate: moderate traffic-supporting capacity.
Slight.	Moderate: moderately slow permeability.	Moderate: moderate to high shrink-swell potential.	Moderate: moderate traffic-supporting capacity; moderate to high shrink-swell potential.
Slight.	Severe: 5 to 8 percent slopes; moderately slow permeability.	Moderate: moderate to high shrink-swell potential; 5 to 8 percent slopes.	Moderate: moderate traffic-supporting capacity; moderate to high shrink-swell potential.
Slight.	Severe: moderately slow permeabiltiy; 5 to 8 percent slopes.	Moderate: moderate to high shrink-swell potential; 5 to 8 percent slopes.	Moderate: moderate traffic-supporting capacity; moderate to high shrink-swell potential.
Slight.	Moderate: 2 to 5 percent slopes.	Slight.	Slight.
Severe: 12 to 30 percent slopes.	Severe: excessive slope.	Severe: excessive slopes.	Moderate: slope to 17 percent. Severe: slope greater than 17 percent.
Moderate: 2 to 5 percent slopes. Severe: 5 to 12 percent slopes.	Moderate: 2 to 5 percent slopes. Severe: 5 to 12 percent slopes.	Slight: slope to 5 percent. Moderate: 5 to 8 percent slopes. Severe: slope greater than 8 percent.	Moderate: moderate trafficability.
Severe: excess wetness.	Severe: excess wetness; very slow permeability.	Severe: excess wetness; very high shrink-swell potential.	Severe: excess wetness; very high shrink-swell potential.

TABLE 8.—*Degree of limitation of*

Soil series and map symbols	Dwellings with—		Recreational uses
	Public or community sewage systems	Septic tank filter fields	Campsites
Stough: St	Severe: excess wetness	Severe: very high water table; moderately slow permeability.	Moderate: excess wetness.
Sumter:			
SuC2, SuD2	Severe: high shrink-swell potential.	Severe: slow permeability; high shrink-swell potential.	Severe: silty clay loam and silty clay surface; poor trafficability.
SvB2, SvC2	Severe: high shrink-swell potential.	Severe: slow permeability; high shrink-swell potential.	Severe: poor trafficability
Urbo: Ur	Severe: excess wetness; subject to flooding; high to very high shrink-swell potential.	Severe: excess wetness; subject to flooding; high to very high shrink-swell potential.	Severe: excess wetness; poor trafficability.
Wilcox:			
WcA	Severe: excess wetness; very high shrink-swell potential.	Severe: excess wetness; very slow permeability; very high shrink-swell potential.	Severe: excess wetness; moderate trafficability.
WlB2, WlC2, WlD2	Severe: excess wetness; very high shrink-swell potential.	Severe: excess wetness; very slow permeability; very high shrink-swell potential.	Moderate: excess wetness; moderate trafficability.
WlF2	Severe: excessive slope; very high shrink-swell potential.	Severe: excessive slope; very high shrink-swell potential; very slow permeability.	Severe: slope of 12 to 35 percent.

Campsites are areas suitable for pitching tents and for living outdoors for at least a week. Little preparation of the soils at a site is required. Wetness is a serious limitation. Favorable features are an attractive landscape, good foot trafficability, and at least moderate stands of grass and trees. Limitations of soils used for campsites are slight if (1) the slope is 0 to 8 percent; (2) trafficability is good; and (3) inherent erodibility is slight to moderate.

Limitations for campsite use are moderate if (1) the slope is 8 to 12 percent; (2) trafficability is fair; and (3) inherent erodibility is severe.

Limitations for campsite use are severe if (1) the slope is more than 12 percent; (2) trafficability is poor; or (3) inherent erodibility is very severe.

Picnic areas are areas suitable for pleasure outings at which a meal is eaten out of doors. Picnic tables and fireplaces are usually furnished, and little site preparation should be needed. The chief requirements are (1) an attractive landscape; (2) good foot trafficability; and (3) suitable slope (fig. 8).

Limitations of soils used for picnic areas are slight if (1) the slope is 0 to 8 percent; (2) trafficability is good; and (3) inherent erodibility is slight to moderate.

Limitations are moderate if (1) the slope is 8 to 12 percent; (2) trafficability is fair; and (3) inherent erodibility is severe.

Limitations for picnic areas are severe if (1) the slope is more than 12 percent; (2) trafficability is poor; or (3) inherent erodibility is very severe.

Intensive play areas are areas formed for playgrounds and for baseball diamonds, tennis and badminton courts, and other sites for other organized games. These soils are subject to intensive foot traffic. Generally required are nearly level surface, good drainage, and a firm surface. The area should be free of coarse fragments and rock outcrops.

The limitations of soils used for intensive play areas are slight if (1) the slope is less than 2 percent; (2) depth to the fragipan or claypan is more than 36 inches; (3) the trafficability is good; (4) permeability is very rapid through moderate.

Limitations for intensive play areas are moderate if (1) the slope is 2 to 5 percent; (2) the fragipan or claypan is not above a depth of 36 inches; (3) the trafficability is fair; or (4) permeability is moderately slow or slow.

The limitations for intensive play areas are severe if (1) the slope is more than 5 percent; (2) a fragipan or claypan is at a depth of 10 to 36 inches; (3) the *soils for town and country planning*—Continued

Recreational uses—Continued		Light industries	Trafficways
Picnic areas	Intensive play areas		
Moderate: excess wetness	Moderate: excess wetness; water table below depth of 20 inches during peak use.	Severe: excess wetness	Moderate to severe: excess wetness; perched water table.
Severe: poor trafficability	Severe: poor trafficability	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Severe: poor trafficability	Severe: poor trafficability	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Severe: excess wetness; poor trafficability.	Severe: excess wetness; poor trafficability.	Severe: excess wetness; subject to flooding; high to very high shrink-swell potential.	Severe: excess wetness; subject to flooding; high to very high shrink-swell potential.
Moderate: excess wetness; fair trafficability.	Severe: very slow permeability.	Severe: excess wetness; very high shrink-swell potential.	Severe: very high shrink-swell potential; excess wetness.
Moderate: excess wetness; moderate trafficability.	Severe: very slow permeability; slope.	Severe: excess wetness; very high shrink-swell potential.	Severe: very high shrink-swell potential; excess wetness.
Severe: slope of 12 to 35 percent.	Severe: slope of 12 to 35 percent.	Severe: slope of 12 to 35 percent; very high shrink-swell potential.	Severe: slope of 12 to 35 percent; very high shrink-swell potential.

trafficability is poor to very poor; or (4) permeability is very slow.

Light industries refers to buildings other than residences that are used for stores, offices, and small industries, none of which are more than three stories high. It is assumed that public or community sewage disposal facilities are provided. (The most limiting property determines the suitability for use.)

The limitations for light industries are slight if (1) the slope is less than 5 percent; (2) the water table is below a depth of 40 inches; (3) the flood hazard is none; (4) shrink-swell potential is very low to low; and (5) the corrosion potential is very low to low.

The limitations for light industries are moderate if (1) the slope is 5 to 8 percent; (2) the water table is between depths of 15 and 40 inches; (3) the flood hazard is none; (4) shrink-swell potential is moderate; or (5) the corrosion potential is moderate.

The limitations for light industries are severe if (1) the slope is more than 8 percent; (2) the water table is at a depth of less than 15 inches; (3) the soils are subject to flooding; (4) shrink-well potential is very high or high; or (5) the corrosion potential is high or very high.

Trafficways refers to low-cost roads and residential streets that can be built without much cutting, filling, and preparation of subgrade.

The limitations of soils used for trafficways are slight if (1) the slope is less than 8 percent; (2) the fragipan or claypan is at a depth of more than 36 inches; (3) the water table is below a depth of 40 inches; (4) flooding is not a hazard or is infrequent; (5) inherent erodibility is slight or moderate; or (6) the traffic-supporting capacity is good.

The limitations for trafficways are moderate if one of the following applies: (1) the slope is 8 to 17 percent; (2) a fragipan or claypan is at a depth of 10 to 36 inches; (3) the water table is at a depth between 15 and 40 inches; (4) floods do not occur every year and last for less than 7 days; (5) inherent erodibility is severe; and (6) the traffic-supporting capacity is fair.

The limitations for trafficways are severe if any of the following applies: (1) the slope is more than 17 percent; (2) depth to the fragipan or claypan is less than 20 inches; (3) the water table is at a depth of less than 15 inches; (4) floods lasting more than 7 days occur more than once every year; (5) inherent erodibility is very severe; and (6) traffic-supporting capacity is poor.

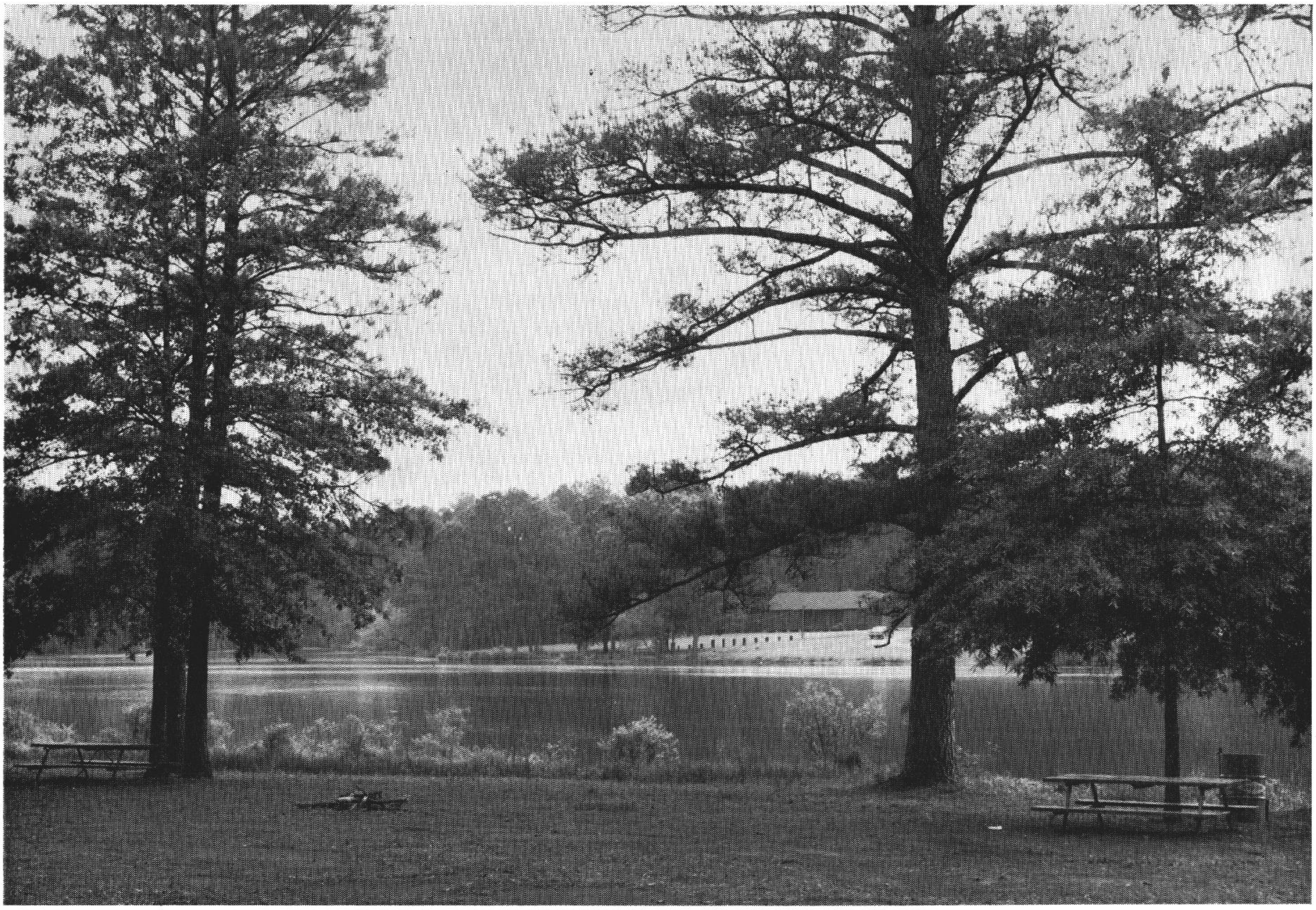

Figure 8.—**Recreation area, Lake Dorman, on Wilcox silty clay loam.**

Formation and Classification of Soils [6]

Soil covers the land surface of the earth. It ranges in thickness from a few inches in some locations to several feet in others. It also varies in color, texture, fertility, and other properties, although it is mainly a mixture of minerals, organic matter, water, and air.

Factors of Soil Formation

Soil development is one of nature's greatest processes. It begins with soil materials and forms soil profiles as final products. The different kinds of soils are the results of the action and interaction of soil-forming factors such as climate and living organisms acting on soil parent materials, as conditioned by relief and drainage over a long period of time. A soil at any location has formed under the influence of five factors: namely, parent material, climate, relief and drainage, living organisms, and time. All of these factors govern the genesis or formation of every soil in this nation, state, or county. The relative influence of each factor varies with the environment from place to place. One factor may be dominant in soil development in some locations and determine most of the soil properties. In Oktibbeha County parent materials have had a strong influence on the nature of the soils. This is evidenced by the three distinct Land Resource areas present. There are also visible and measurable soil properties that reflect the influence of relief and drainage, such as gray colors in the Myatt soils.

Soil development has two major steps, or parts. First is accumulation or deposition of soil materials, and next is the formation of horizons to form definite soil profiles. The horizons emerge slowly as changes occur in the parent material. Thus we find some profiles that have faint horizons, some that have distinct horizons, and some that have prominent ones. Under favorable conditions, horizons change from faint to distinct during the passage of time and increase in number. The number and distinctness of horizons enable soil scientists to determine the age, or stage of formation, that a soil profile has reached.

[6] This section was prepared by DR. H. B. VANDERFORD, professor of soils, Mississippi State University.

Parent material

All the parent material of Oktibbeha County is of marine or Coastal Plain origin except the more recent, alluvial sediments in valleys along the streams. There are three distinctly different Coastal Plain Formations in the county. These are Selma Chalk, Porters Creek Clay, and the Wilcox Formation. Materials from these different geological formations have influenced the texture, mineralogy, and inherent fertility of the soils.

The soils in the eastern part of the county developed from marl or chalk and clays over the marl. These materials have been reworked and deposited by stream action in the flood plains of the Blackland part of Oktibbeha County. This part of the county is in the Alabama and Mississippi Blackland Prairies. Most of the soils have inherited a high content of montmorillonite clay, much calcium carbonate, and a fairly high level of plant nutrients. The Houston and Brooksville soils have these properties. Such properties influence the productivity, the engineering properties, and the use and management of the soils. The Prairie soils of the Blackland are greatly different from the other soils of the county in color, texture, reaction, and natural fertility.

The Southern Coastal Plain Resource Area, locally called the "Interior Flatwoods," covers the central part of the county. The soils in this part of the county formed in soft shale (Porters Creek Clay) and silty and loamy deposits over the shale. This Coastal Plain Formation is impervious, and the soils have a tendency to be wet. This excess water has influenced the genesis of the soils. These parent materials have given rise to soils that range from loams to clays and are low in inherent fertility. The Adaton and Longview soils are examples. The materials have been redeposited along the stream valleys as loamy and clayey alluvial sediments. The flood plain soils are used for the production of row crops, but most of the upland soils are in timber and forest products.

The soils in the extreme western part of the county formed in loamy Coastal Plain sediments over the lignitic shale (Porters Creek Clay) of the "Interior Flatwoods." This is the Sand-Clay Hills of the Southern Coastal Plain Resource Area. These parent materials have formed soils that are loamy to clayey and highly leached. The Ruston and Maben soils formed under these conditions. The topography is rolling to steep, and erosion has taken a heavy toll from a few of the unprotected soils on uplands. The soils in the bottoms, such as the Mantachie, and on stream terraces, such as the Prentiss, formed in loamy sediments that were deposited by the local streams. These soils are suitable for cultivated crops and, under good management, have high productivity. Many of the soils on uplands are steep and are in timber and pasture crops.

The parent materials have had a dominating influence on the soils of Oktibbeha County. This can be readily observed as one travels across the county from east to west, or from the Blackland Prairie Area to the Interior Flatwoods and on into the Sand-Clay Hills to the west.

Climate

Rainfall and temperature are the two major components of climate and both of these are active factors in soil formation. They influence the rates of weathering of parent materials and the decomposition of minerals. They also influence leaching, migration of fine particles, and illuviation. Therefore climate has had a direct influence in the genesis of the soils of this county. It also has had indirect effects, since climate governs to a great extent the kinds of plants and animals that thrive on and in the soil.

The climatic effects are uniform over Oktibbeha County because the climate is the same over the entire area. (The average rainfall is about 50 inches per year, and the average temperature is about 65° F.) Organic matter decomposes at a rapid rate, and the high rainfall causes much leaching. This process tends to make the soils acid in reaction. Many of the soils of the Blackland Prairie Area, such as Sumter and Binnsville, are not acid in reaction, because of the nature of the parent material. The trend is toward acidity, however.

Relief and drainage

The topography, or lay of the land, affects the drainage and rate of runoff. Thus relief influences the moisture conditions in soils and erosion that occurs on the land surface. The rate of runoff is greater on steep slopes than it is on the gentle slopes and level areas. This means that the amount of water that moves through the soil during development depends partly on the relief. Excess water is present on and in soils that form on low and flat topography. This extra water causes gray and mottled colors in the subsoil, and sometimes an accumulation of organic matter in the surface layer. The influence of wetness is well expressed in many of the Interior Flatwoods and Blackland Prairie soils, such as the Adaton, Sessum, and Leeper.

Fragipan formation also is associated with relief and drainage. These compact, brittle horizons have the strongest expressions on level to gently sloping topography and under somewhat poorly drained to moderately well drained conditions. The Savannah and Prentiss soils have a fragipan in the profiles. Fragipans govern the depth that roots, air, and water can penetrate the soils, as well as the permeability and wetness. In comparison with the other factors of soil development, relief and drainage are more local in scope, and their influence on the soils can be observed on small farms. Slope, or lay of land, is important in the uses to which land is put, as well as to the productivity of the crops grown.

Living organisms

Plants and animals, especially the small ones (earthworms and insects), living in and on the soil have a direct influence on the nature of soils. Under natural conditions, plants, or native vegetation, govern the amount and distribution of organic-matter content in a soil profile.

Under forest conditions organic-matter content is added by the decomposition of leaves and twigs on the surface. Therefore, the accumulation of organic matter under trees is usually confined to the A horizon. The soils of the Interior Flatwoods and Sand-Clay Hills developed under forest cover and have this characteristic. Soils like Maben, Savannah, Longview, and Wilcox have most of the organic-matter content in the A horizon. Under native grasses the fibrous roots decay and add organic matter within the profile as deep as the roots grow. This process causes soils that form under native grasses to have a thick A horizon of dark color that extends as much as 2 feet deep.

Some of the upland soils of the Blackland Prairie, such as Houston and Brooksville, formed under grasses. These soils have a dark-colored, thick A horizon and are locally called "black prairie" soils. All the other soils of Oktibbeha County formed under forest conditions. Hardwoods (post oak, hackberry, red oak, and hickory), under which the Kipling and Oktibbeha soils formed, covered the forest sites of the Blackland Prairie. Loblolly and short-leaf pine, oak, and hickory provided the cover for the Sand-Clay Hills section of the western part of the county.

Time

Soil formation is a slow process, and many thousands of years are required for most soils to form. The weathering of rocks and materials precedes the formation of horizons in soil profiles. Both require much time in terms of the calendar and compared to the span of human life. For example, the Selma Chalk Formation that is under the Blackland Prairie was deposited by the Gulf of Mexico about 70 million years ago. The other geologic formations in Oktibbeha County are somewhat younger than the Selma Chalk.

From the example above, it can be seen that all of the soils of this county have been forming and changing for long periods of time. The alluvial soils along the streams are not so old because material has been and is still being deposited on them. The Leeper, Marietta, Mathiston, and Mantachie soils occur in the flood plains and are important for the production of row and forage crops.

Soil Morphology

Every soil has a profile, or body, which is composed of a succession of layers called horizons. This vertical section extends from the surface down to material that is not soil. This depth may extend several feet in places or to the lower limit of root growth. Every soil profile consists of two or more horizons lying one below the other and parallel to the land surface (*10*). The nature of the soil profile and the horizons within it indicate the influence of soil-forming factors and how plants will perform when growing on a particular soil.

Most soils have three main horizons, identified by the letters A, B, and C. The Ruston and Savannah soils of Oktibbeha County have reached this stage of formation and are called mature soils. Some soils, however, do not have B horizons but have A and C horizons and are young soils. Such soils are found in the flood plains of this county. The C horizon is the parent material; that is, the material, or assumed to be the material, from which the soil (A and B horizons) formed. The A horizon is often called the surface soil, and the B is called the subsoil. The combination of A and B horizons is called the solum.

All of the major horizons of a soil profile may be subdivided into minor horizons. These are identified in morphological studies by subscription, as follows: A1, A2, Ap, B1, B2, B3, and Bx. The subdivisions of the major horizons provide clues to the soil-forming factors that have left marks in the profiles and are important in classification and the use and management of the soils.

The A horizon is at the surface and is commonly called the surface soil. It has the greatest organic-matter content and is the horizon in which biological processes are most active. It is also the horizon that rain reaches first and therefore has undergone the most severe leaching, and normally has lost most of its soluble material. Also, the finely divided mineral material, or clay, has been removed from some soils, as well as oxides of aluminum and iron. The iron is in the same state as the iron in rust on farm equipment left out in the weather. Generally, the A horizon has undergone the greatest amount of leaching and is called an eluvial horizon.

The B horizon, which is immediately below the A horizon, is usually called the subsoil. It has less organic-matter content and less biological activity and, under moderately well drained or well drained conditions, has brighter colors. In some soils part of the material removed from the A horizon has accumulated in the B and imparted to it a finer texture and a more or less blocky structure. In many soils the bright yellowish-brown or brown colors of this horizon are caused partly by iron compounds that have been removed from the surface layer and redeposited as coatings on soil particles in the B horizon. These colors are found in the Savannah and Providence soils of Oktibbeha County.

The C horizon is the deepest of the major horizons. It is usually lighter in color, is lower in organic-matter content, and has less biological activity than the A or B horizons. The rock material that makes up this horizon in mineral soils may have accumulated as a result of the weathering in place of the underlying rock, or it may have accumulated as a result of deposition by water or by wind.

Classification of Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories, so that information can be applied to large geographic areas.

The system of classifying soils currently used in the United States was developed in the early sixties (*7*) and was adopted by the National Cooperative Soil Survey in 1965 (*12*). It is under continual study.

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 9 shows the classification of each soil series of Oktibbeha County by family, subgroup, and order, according to the current system. Some of the soils in this county do not fit in a series that has been recognized in the classification system, but recognition of a separate series would not serve a useful purpose. Such soils are named for the series they strongly resemble, because they differ from those series in ways too small to be of consequence in interpreting their usefulness or behavior. Such soils are designated as taxadjuncts to the series for which they are named. In this survey, soils named in the Houston, Ochlockonee, and Oktibbeha series are taxadjuncts to those series.

Order: The order is the highest category in the new classification system. Ten soil orders are recognized in the current system. These are: Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties on which orders are based are those that tend to give broad climatic grouping of soils. Two exceptions are the Entisols and Histosols that occur in many different climates.

Six soil orders are represented in Oktibbeha County. These are: Entisols, Vertisols, Inceptisols, Mollisols, Alfisols, and Ultisols.

Entisols are young or recent soils that do not have genetic horizons or have only the beginnings of such horizons. The Ochlockonee soils are in this order. These soils occur on flood plains.

Vertisols are soils high in swelling and shrinking clays that crack in dry weather. Brooksville and Houston, being high in montmorillonite clay, are unstable soils and are placed in the Vertisol order.

Inceptisols most often occur on young, but not recent, land surfaces. The Mantachie and Leeper soils are examples of this order.

Mollisols are soils with dark-colored surface layers that are high in calcium and in percentage of base saturation. The Binnsville and Catalpa soils are classified in this order.

Alfisols are soils that have clay-enriched B horizons high in percentage base saturation. The Providence and Kipling soils are examples of this order.

Ultisols have a clay-enriched B horizon that has less than 35 percent base saturation, which decreases with depth. There are many soils in Oktibbeha County classified in this order. The Ruston, Savannah, Prentiss, Myatt, and Stough soils are Ultisols.

Suborder: Each order is subdivided into suborders, primarily on basis of those soil characteristics that

TABLE 9.—*Classification of soil series in Oktibbeha County, Mississippi*

Series	Family	Subgroup	Order
Adaton	Fine-silty, mixed, thermic	Typic Ochraqualfs	Alfisols.
Binnsville	Clayey, mixed, thermic, shallow	Typic Rendolls	Mollisols.
Boswell	Fine, mixed, thermic	Vertic Paleudalfs	Alfisols.
Brooksville	Fine, montmorillonitic, thermic	Aquic Chromuderts	Vertisols.
Catalpa	Fine, mixed, thermic	Aquic Fluventic Hapludolls	Mollisols.
Falkner	Fine-silty, siliceous, thermic	Aquic Paleudalfs	Alfisols.
Freestone	Fine-loamy, siliceous, thermic	Aquic Paleudalfs	Alfisols.
Houston [1]	Very fine, montmorillonitic, thermic	Typic Chromuderts	Vertisols.
Kipling	Fine, montmorillonitic, thermic	Vertic Hapludalfs	Alfisols.
Leeper	Fine, montmorillonitic, nonacid, thermic	Chromudertic Haplaquepts	Inceptisols.
Longview	Fine-silty, siliceous, thermic	Aqueptic Fragiudalfs	Alfisols.
Maben	Fine, mixed, thermic	Ultic Hapludalfs	Alfisols.
Mantachie	Fine-loamy, siliceous, acid, thermic	Aeric Fluventic Haplaquepts	Inceptisols.
Marietta	Fine-loamy, mixed, thermic, siliceous	Aquic Fluventic Eutrochrepts	Inceptisols.
Mathiston	Fine-silty, siliceous, acid, thermic	Aeric Fluventic Haplaquepts	Inceptisols.
Myatt	Fine-loamy, siliceous, thermic	Typic Ochraquults	Ultisols.
Ochlockonee [2]	Coarse-loamy, siliceous, acid, thermic	Typic Udifluvents	Entisols.
Oktibbeha [3]	Very fine, montmorillonitic, thermic	Vertic Hapludalfs	Alfisols.
Oktibbeha, thick solum variant.	Fine, mixed, thermic	Typic Hapludalfs	Alfisols.
Prentiss	Coarse-loamy, siliceous, thermic	Ochreptic Fragiudults	Ultisols.
Providence	Fine-silty, mixed, thermic	Typic Fragiudalfs	Alfisols.
Ruston	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Savannah	Fine-loamy, siliceous, thermic	Typic Fragiudults	Ultisols.
Sessum	Fine, montmorillonitic, thermic	Vertic Ochraqualfs	Alfisols.
Stough	Coarse-loamy, siliceous, thermic	Aquic Fragiudults	Ultisols.
Sumter	Fine-silty, carbonatic, thermic	Rendollic Eutrochrepts	Inceptisols.
Urbo	Fine, mixed, acid, thermic	Aeric Fluventic Haplaquepts	Inceptisols.
Wilcox	Fine, montmorillonitic, thermic	Vertic Hapludalfs	Alfisols.

[1] These soils are correlated as taxadjuncts to the Houston series. They have an average of 50 percent clay in the 10-to-40-inch control section.

[2] These soils are correlated as taxadjuncts to the Ochlockonee series. They have weak structure below a depth of 20 inches.

[3] These soils are correlated as taxadjuncts to the Oktibbeha series. Clay content of the upper 20 inches of the B horizon is 50 to 60 percent instead of more than 60 percent.

seem to produce classes having the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation.

Great Group: Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated, or those that have fragipans that interfere in the growth of roots or the movement of water. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like.

Subgroup: Great groups are divided into subgroups, one representing the central (typic) segment of a group, and others, called intergrades, that have properties of one great group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of another great group, subgroup, or order.

Family: Families are separated within a subgroup primarily on the basis of properties important to the growth of plants or behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

Series: The series is a group of soils having major horizons that, except for the texture of the surface layer, are similar in important characteristics and arrangement in the profile. The soil series generally is given the name of a geographic location near the place where a soil of that series was first observed and mapped. An example is the Brooksville series.

Mineralogy of Soils and Parent Material[7]

The approximate mineral composition of clays in Oktibbeha County soils is given in table 10. Soils in eastern Oktibbeha County lie within the Mississippi Blackland Prairie. These soils were formed from Cretaceous marls, calcareous clays, and silty clays. Locally these Cretaceous materials are referred to as chalk. The common soils of the area are Houston, Sumter, Catalpa, and Brooksville. There are also areas of Kipling and Sessum soils distributed among the soils throughout the Blackland Prairie. These latter soils were formed from thin caps of acid clays overlying the Cretaceous sediments. These soils all have fine-textured subsoil having a clay content ranging as high as 40 to 60 percent. About 60 percent of the clay consists of the expansible type layer silicates, montmorillonite, and vermiculite (*5*). Dioctahedral montmorillonite is by far the most abundant silicate. This abundance of

[7] Prepared by DR. R. C. GLENN, professor of agronomy, Mississippi State University.

TABLE 10.—*Approximate mineralogy of <0.002 mm. clay fractions in Oktibbeha County soils*

Soil series	Percentage of clay minerals						
	Quartz	Vermiculite	Mica	Montmorillonite	Chlorite	Kaolinite	Amorphous silica, iron, and alumina
Adaton	5	5	20	45	5	15	5
Binnsville	5	10	10	50	(1)	20	5
Boswell	5	5	15	40	5	20	10
Brooksville	5	10	10	50	(1)	20	5
Catalpa	5	10	15	50	(1)	15	5
Falkner	10	5	15	35	5	20	10
Freestone	10	5	15	30	10	20	10
Houston	5	10	10	50	(1)	20	5
Kipling	5	5	10	40	5	35	10
Leeper	5	10	10	50	(1)	20	5
Longview	15	5	15	15	15	25	10
Maben	15	0	10	5	20	35	15
Mantachie	10	5	15	20	10	30	10
Marietta	5	10	10	45	(1)	25	5
Mathiston	15	5	15	20	10	25	5
Myatt	15	5	15	20	10	25	10
Ochlockonee	15	5	15	15	10	30	10
Oktibbeha	5	5	15	40	5	20	10
Prentiss	15	5	15	10	15	30	10
Providence	10	5	20	20	15	20	10
Ruston	15	5	15	5	15	35	10
Savannah	10	5	15	10	20	30	10
Sessum	5	5	10	45	5	25	5
Stough	15	5	15	10	15	30	10
Sumter	5	10	10	50	(1)	20	5
Urbo	5	5	15	45	5	20	5
Wilcox	5	5	20	45	5	15	5

[1] Trace.

montmorillonite gives these soils high cation-exchange capacities and high shrink-swell potentials.

Kaolinite makes up 20 to 25 percent of the clay and is mostly of 2 to 0.2 micron size. The Kaolinite is inherited from the parent sediments instead of being formed through weathering of other minerals. The remainder of the clay consists of mica, quartz, and amorphous material. Most of the soils also contain minute amounts of chlorite. The chlorite is mostly pedogenic from vermiculite in the acid soils, but is probably inherited from the parent material in the neutral and alkaline soils.

The total potassium content of soils in the Blackland Prairie, to a depth of 6 inches, ranges from 10,000 to 20,000 pounds per acre and occurs mostly in mica minerals. Calculations were based on total clay content, and K_2O allocations to mica account for practically all K_2O in the soils. Microscope examinations of coarse silts and sands reveal only a few grains of feldspar minerals. The vermiculite in clays of the nonacid soils has a high potassium-fixing capacity. This capacity to fix potassium has been reduced in the acid soils by absorption of complex aluminum molecules on exchange sites between vermiculite layers.

The parent material of the soils of the Blackland Prairie has a carbonate content ranging from 50 to 85 percent. X-ray examinations of the carbonates from several areas show complete absence of dolomite. The clay minerals are also low in magnesium, which, in turn, is only slowly released by weathering. The plant-available magnesium content of these soils is, therefore, extremely low, and crops often require magnesium fertilization.

In central Oktibbeha County, to the north and south of Starkville, there occurs a narrow band of soils derived from Clayton Formation sediments overlying Prairie Bluff Chalk. Soils derived from Clayton Formation are redder than Blackland Prairie soils and somewhat coarser in texture. The principal soil from Clayton sediments is the Freestone. Clayton sediments are acid sandy clay loams and clay loams containing glauconite. When the glauconite weathers, iron is released and oxidized and the oxide gives the soils their reddish color. Clays of the soils derived from Clayton sediments are lower in montmorillonite and slightly higher in mica, quartz, and chlorite than soils of Blackland Prairie. Kaolinite content of the two groups of soils is about the same. As a result of slightly coarser texture and lower amounts of montmorillonite in their clays, the Clayton Formation soils have lower cation-exchange capacities and lower shrink-swell potentials than the Blackland Prairie soils.

The soils of western Oktibbeha County formed in Porter's Creek sediments or thin terrace sediments over the Porter's Creek Formation. The overlying terrace sediments are higher in silt and sand, and many of the soils in the area may have a loamy texture in the surface layer. Porter's Creek sediments are typically clay and silty clay, and soils formed from them are highly plastic and sticky. These soils contain montmorillonite as the predominant clay mineral. Mica is a fairly common mineral in Porter's Creek clay, and soils developed from it contain appreciable amounts of mica. Kaolinite occurs in noticeable quantities but in lower amounts than is observed in soils of Blackland Prairie. Where soils from terrace material mixed with Porter's Creek material, their clays are higher in kaolinite and also contain substantial amounts of pedogenic chlorite. Typical soils formed in Porter's Creek material contain only small amounts of chlorite but are high in exchangeable aluminum.

The Wilcox sediments that overlie the Porter's Creek Formation along the western edge and southwestern corner of Oktibbeha County were apparently sedimented in a fluctuating, shallow, coastal-marine environment. In places, numerous cut-and-fill sedimentation patterns resembling stream channel activity are apparent. Clay lenses 2 to 24 inches thick, alternating with thicker clay loam and sandy loam beds, are commonplace throughout the formation. Beds of clay-ball conglomerates, which have clay balls 1 to 3 centimeters in diameter, occur near the base of the formation. A study of sections of the Wilcox soils showed montmorillonite to be a major mineral constituent of the clay lenses, kaolinite being the more abundant clay mineral in the loamy beds and in the beds of clay-ball conglomerate.

Soils formed from Wilcox sediments have clay mineralogy resembling the particular beds from which they were derived. The Ruston soils and Maben soils probably formed from the respective sandy loam and clay loam beds and have high kaolinite and low montmorillonite clay mineralogy. The Boswell soils in the area likely formed from beds containing thick lenses of montmorillonite clay, and their resulting clay minerals are high in montmorillonite. The local flood plains containing Mantachie, Myatt, and Ochlockonee soils received sediments from each of the various Wilcox beds, and probably from the underlying Porter's Creek clay as well.

Chemical Properties of the Soils [8]

Only those chemical properties most characteristic of various groups of soils in Oktibbeha County are discussed in this subsection. Table 11 contains data on the chemical nature of soils in the county. Analyses were made by the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural Experiment Station. These samples are identified by the MAES-SGM prefix. Samples were collected from pits at typical locations for each soil and were air dried and crushed to 2 millimeters.

Chemical analysis was made by methods described in commonly available references (*2*, *3*, *6*). Samples were prepared by airdrying, grinding, and screening through a standard 20-mesh sieve.

Soil reaction (pH) was determined on a mixture of soil and water at a ratio 1:1, using a Beckham pH meter.

The percentage of organic matter in the soil samples was estimated by determination of organic carbon content, using the potassium dichromate-sulfuric acid digestion method. The organic carbon content is converted to percentage of organic matter by using this equation: percent carbon x 1.724 = content of organic matter.

[8] By R. C. GLENN, agronomist and professor of agronomy, Mississippi State University and Agricultural Experiment Station.

TABLE 11.—*Chemical*

[Analyzed by the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural Experiment Station. Dashes

Soil type	MAES–SGM 68 sample number	Horizon	Depth from surface	Reaction	Organic matter	Cation exchange capacity by ammonium acetate
			Inches	*pH*	*Percent*	*Meq./100 gm. of soil*
Adaton silt loam	596	Ap	0–6	5. 1	2. 08	19. 3
	597	B22tg	19–41	4. 5	. 46	21. 3
Binnsville silty clay loam	623	Ap	0–8	7. 3	2. 85	36. 9
	624	R	8–40	8. 0	. 55	8. 1
Boswell fine sandy loam	557	Ap	0–5	6. 2	. 70	4. 5
	558	B21t	5–8	4. 8	. 70	18. 0
	559	B22t	8–19	5. 1	. 65	25. 1
	560	B23t	19–25	5. 0	. 38	25. 5
	561	B24t	25–41	4. 9	. 38	26. 5
	562	B25t	41–55	4. 8	. 29	30. 4
Brooksville silty clay	670	Ap	0–6	5. 7	2. 47	36. 8
	671	A12	6–18	5. 2	1. 77	40. 5
	672	AC1	18–25	5. 4	1. 15	39. 0
	673	AC2	25–37	5. 5	1. 33	42. 5
	674	C	37–52	6. 8	. 70	41. 6
Catalpa silty clay loam	665	Ap	0–9	5. 7	3. 00	32. 5
	666	A1	9–20	6. 1	2. 23	33. 9
	667	B21	20–26	6. 6	. 97	34. 3
	668	B22	26–35	6. 7	. 55	33. 9
	669	B3	35–52	6. 7	. 46	32. 5
Falkner silt loam	572	Ap	0–6	5. 3	1. 25	16. 7
	573	B21t	6–18	5. 2	. 55	17. 5
	574	B22t	18–27	4. 9	. 50	24. 3
	575	IIB23t	27–49	5. 0	. 38	37. 4
	576	IIB3	49–64	5. 0	. 38	32. 5
Freestone fine sandy loam	675	Ap	0–5	5. 1	2. 23	11. 3
	676	B21t	5–15	4. 8	. 46	14. 8
	677	B22t	15–22	5. 0	. 46	17. 8
	678	B23tg	22–40	4. 7	. 25	21. 0
	678A	B3tg	40–60	5. 0	----------	25. 8
Houston silty clay	660	Ap	0–9	7. 2	3. 54	46. 1
	661	A12	9–20	7. 2	1. 98	32. 5
	662	A13	20–24	7. 4	1. 77	40. 6
	663	AC	24–45	7. 8	. 70	43. 3
	664	C	45–64	7. 8	. 46	31. 8
Kipling silty clay loam	579	Ap	0–5	5. 4	1. 45	12. 0
	580	B21t	5–9	5. 4	. 78	16. 7
	581	B22t	9–15	5. 3	. 55	20. 2
	582	B23t	15–28	4. 6	. 46	34. 3
	583	B3t	28–42	5. 6	. 46	42. 1
	584	C	42–54	6. 6	----------	41. 8
Leeper silty clay loam	684	Ap	0–5	7. 4	1. 65	32. 3
	685	A1	5–9	7. 6	1. 45	32. 3
	686	B21	9–26	5. 9	. 70	28. 1
	687	B22g	26–42	5. 7	. 55	28. 3
	688	Cg	42–53	6. 9	. 32	24. 0
Maben fine sandy loam	611	Ap	0–5	5. 7	----------	13. 7
	612	B21t	5–16	5. 3	----------	29. 5
	613	B22t	16–23	5. 0	----------	29. 9
	614	B3t	23–41	5. 7	----------	20. 0
Mantachie loam	563	Ap	0–8	5. 5	. 62	7. 3
	564	B21	8–19	5. 4	. 56	8. 5
	565	B23g	29–41	5. 4	. 38	8. 9
	566	B24g	41–60	5. 0	. 32	11. 0

See footnotes at end of table.

analysis of selected soils

indicate data not reported for calcareous soils because of the solubility effects of ammonium acetate on calcium carbonate]

Exchangeable cations [1]				Extractable acidity [2]	Extractable aluminum [3]	Sum of bases and hydrogen	Calcium magnesium ratio	Base saturation	
Calcium	Magnesium	Potassium	Sodium					By sum of cations	By ammonium acetate
Meq./100 gm. of soil	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*		*Percent*	*Percent*
9.00	2.64	0.11	0.12	5.60	0.80	17.47	3.4	68	62
5.36	2.43	.07	.46	7.70	8.10	16.02	2.2	52	39
----------	.17	.26	.01	0	0	----------	157.7	----------	----------
----------	.03	.12	.01	0	0	----------	392.0	----------	96
1.10	.04	.25	.02	3.09	.02	4.86	27.5	36	39
2.87	2.38	.49	.03	10.67	2.04	17.44	1.2	38	39
2.66	5.59	.49	.05	13.50	5.74	22.29	.5	39	35
1.59	1.50	.35	.09	16.69	8.91	20.22	1.1	17	14
1.30	6.06	.40	.11	17.82	10.25	25.69	.2	31	30
1.42	7.37	.42	.11	19.90	10.68	29.22	.2	32	31
25.40	1.64	.27	.30	10.00	0	37.61	15.5	73	75
24.00	.90	.30	.53	12.90	0	39.63	26.7	65	64
24.40	.50	.23	.68	13.50	0	39.31	48.8	66	66
27.20	.44	.35	.80	12.80	0	41.59	61.8	69	68
34.40	.70	.26	.96	5.70	0	42.02	49.1	86	87
21.60	.59	.19	.12	16.25	0	38.75	36.6	58	69
26.40	.04	.14	.13	10.70	0	37.41	660.0	71	77
26.40	.03	.23	.14	10.30	0	37.10	880.0	72	92
27.00	.03	.17	.18	10.70	0	38.08	900.0	72	95
28.60	.03	.25	.30	5.10	0	34.68	953.3	84	90
4.02	2.17	.21	.22	13.94	3.59	20.56	1.9	32	40
2.12	1.34	.21	.33	15.70	5.92	19.70	1.6	20	23
1.84	2.00	.33	.56	21.34	----------	26.07	.9	18	20
2.91	3.85	.58	1.13	27.07	16.10	35.54	.8	24	23
4.91	5.45	.40	1.33	18.22	4.80	30.31	.9	40	37
6.19	.68	.10	.07	4.40	0	11.44	9.0	62	63
2.40	.23	.20	.21	12.80	6.40	15.84	10.4	19	21
2.72	.35	.16	.30	16.16	8.30	19.69	7.8	18	21
3.98	.44	.23	.39	17.09	8.30	22.13	9.1	23	24
10.46	.20	.11	.07	13.72	----------	24.56	----------	44	42
36.80	.11	.35	.03	1.64	0	38.93	334.6	96	81
41.40	.07	.41	.07	4.81	0	46.76	591.4	90	112
42.40	.05	.29	.09	2.37	0	45.20	848.0	95	105
----------	.04	.23	.06	.05	0	----------	860.0	----------	80
----------	.05	.19	.06	0	0	----------	572.0	----------	91
4.91	.23	.73	.11	9.40	.87	15.38	21.4	39	49
4.81	.30	.15	.21	14.49	5.60	19.96	16.0	27	33
5.59	.15	.20	.36	16.35	6.56	22.66	37.3	28	31
10.95	.21	.23	.99	18.69	8.58	31.07	52.1	40	36
19.95	.25	.36	.15	18.97	5.73	39.68	79.8	52	49
30.20	.60	.26	1.89	7.27	----------	40.23	50.3	82	79
34.40	.04	.38	.06	1.88	0	36.76	860.0	95	108
32.60	.28	.43	.10	2.50	0	35.91	116.4	93	104
20.80	.17	.32	.21	6.77	0	28.27	122.4	76	76
23.80	.25	.39	.26	5.30	0	30.00	95.2	82	87
22.40	.20	.31	.31	4.20	0	27.42	112.0	85	97
4.92	2.02	.44	.21	10.25	0	17.84	2.4	42	55
10.75	6.50	.52	.42	12.79	.40	30.98	1.7	59	62
5.23	4.47	.41	.42	22.27	9.40	32.38	1.2	33	35
1.79	3.24	.33	.46	17.29	8.50	23.11	.5	25	29
1.60	.72	.07	.11	5.54	1.33	8.04	2.2	31	34
1.54	.28	.17	.12	9.50	1.84	11.61	5.5	18	25
.64	.73	.30	.14	9.48	2.95	11.29	.9	16	20
.18	2.07	.06	.24	10.45	4.54	13.00	.1	20	23

TABLE 11.—*Chemical*

Soil type	MAES–SGM 68 sample number	Horizon	Depth from surface	Reaction	Organic matter	Cation exchange capacity by ammonium acetate
			Inches	*pH*	*Percent*	*Meq./100 gm. of soil*
Marietta fine sandy loam	689	Ap	0–6	6. 7	1. 55	9. 1
	690	B21	6–15	7. 0	. 38	10. 0
	691	B22	15–26	6. 9	. 62	13. 3
	692	B23	26–55	7. 2	. 32	11. 8
Mathiston silt loam	625	Ap	0–6	5. 2	1. 15	9. 7
	626	B21	6–14	4. 7	. 62	12. 4
	627	B22g	14–22	4. 7	. 46	13. 2
	628	B23g	22–39	4. 7	. 32	14. 8
	629	B3g	39–52	4. 5	. 32	13. 7
Ochlockonee loam	693	Ap	0–7	5. 1	. 95	6. 3
	694	C1	7–20	4. 9	. 46	7. 0
	695	C2	20–28	4. 9	. 32	7. 0
	696	C3	28–36	4. 9	. 46	8. 4
	697	C4	36–52	4. 9	. 25	9. 9
Oktibbeha silty clay loam	583	Ap	0–4	6. 4	4. 15	25. 0
	584	B21t	4–12	4. 4	1. 25	40. 9
	585	B22t	12–16	4. 3	. 62	45. 8
	586	B23t	16–24	4. 4	. 78	47. 0
	587	B3	24–34	4. 6	. 55	49. 4
	588	C	34–45	8. 3	2. 75	
Prentiss silt loam	606	Ap	0–5	6. 9	1. 55	9. 3
	607	B21	5–17	4. 9	. 32	6. 9
	608	B22	17–23	4. 8	. 32	6. 9
	609	Bx1	23–52	4. 8	. 25	6. 6
	610	Bx2	52–60	5. 1	. 32	11. 0
Providence silt loam, heavy substratum	698	Ap	0–4	5. 4	1. 65	12. 8
	699	B21t	4–16	4. 8	. 46	14. 3
	700	B22t	16–21	4. 9	. 32	18. 3
	701	Bx1	21–34	5. 0	. 46	16. 7
	702	Bx2	34–45	5. 1	. 32	19. 3
Ruston fine sandy loam	630	Ap	0–9	5. 2	. 86	3. 3
	631	A2	9–15	5. 1	. 46	2. 3
	632	B21t	15–32	5. 1	. 46	11. 4
	633	B3	32–43	5. 0	. 32	4. 3
	634	B3&A2	43–55	5. 4	. 18	2. 5
	635	B21t	55–67	5. 2	. 32	4. 5
	636	B22t	67–80	4. 7	. 32	5. 9
Sessum silty clay loam	598	Ap	0–6	4. 8		35. 5
	599	B21tg	6–13	4. 8		36. 6
	600	B21tg	13–24	4. 2		38. 8
	601	B22tg	24–30	4. 5		38. 8
	602	B23tg	30–43	4. 4		42. 2
	603	B3	43–58	4. 5		42. 2
	604	C1	58–68	4. 8		48. 0
	605	C2	68–85	6. 4		50. 7
Stough fine sandy loam	655	Ap	0–5	4. 4	1. 33	5. 4
	656	A2	5–8	4. 8	. 62	4. 0
	657	B2t	8–18	4. 7	. 46	5. 8
	658	Bx1	18–47	4. 7	. 32	6. 2
	659	Bx2	47–60	4. 9	. 32	7. 1
Sumter silty clay loam	642	Ap	0–5	7. 8	2. 60	26. 9
	643	B2	5–8	7. 7	1. 05	23. 3
	644	B3	8–20	7. 6	. 95	17. 0
	645	C1	20–34	7. 7	. 62	16. 2

See footnotes at end of table.

analysis of selected soils—Continued

Exchangeable cations [1]				Extractable acidity [2]	Extractable aluminum [3]	Sum of bases and hydrogen	Calcium magnesium ratio	Base saturation	
Calcium	Magnesium	Potassium	Sodium					By sum of cations	By ammonium acetate
Meq./100 gm. of soil	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*		*Percent*	*Percent*
9.60	.10	.08	.04	1.20	0	11.02	96.0	89	108
10.80	.07	.10	.11	.66	0	11.74	154.2	94	112
12.16	.30	.19	.15	.90	0	13.70	40.5	93	97
10.80	.47	.15	.08	.86	0	12.36	23.0	93	98
3.72	3.45	.39	.03	9.12	.30	16.80	1.1	45	78
2.27	3.70	.24	.04	12.87	3.00	19.12	.6	51	33
2.26	3.92	.24	.04	15.43	6.40	21.89	.6	30	49
1.92	4.18	.29	.05	14.82	8.80	21.26	.5	30	44
1.64	3.81	.31	.04	13.85	8.00	19.65	.4	30	42
1.72	.82	.25	.01	2.60	.22	5.40	2.1	52	45
1.20	1.30	.15	.01	4.00	.90	6.66	.9	40	38
.68	1.47	.20	.03	6.23	1.30	8.61	.5	28	34
.68	1.89	.14	.06	5.60	.84	8.37	.3	33	33
.60	2.27	.19	.09	7.70	2.00	10.85	.3	29	32
20.40	.73	.26	.04	8.24	0	29.68	28.0	72	86
15.00	.83	.36	.06	25.62	9.16	41.87	18.1	39	40
15.20	.29	.37	.08	28.20	12.41	44.13	54.3	36	35
18.20	.50	.32	.15	24.35	14.19	43.52	36.4	44	41
28.80	.83	.40	.19	16.71	4.87	46.93	34.7	64	61
----------	.21	.09	.04	2.63	0	----------	99.1	----------	----------
6.44	.20	.29	.06	3.81	0	10.60	32.2	65	75
1.92	.25	.11	.09	7.52	1.20	9.87	7.7	24	34
1.71	.27	.08	.09	7.52	3.20	9.67	6.3	22	31
1.16	.28	.04	.06	5.66	3.20	7.20	4.1	21	23
1.20	1.92	.19	.42	10.64	5.50	14.37	.6	27	34
3.28	2.71	.27	.02	6.90	0	13.18	1.2	48	49
1.02	2.47	.15	.08	13.10	4.80	16.82	.4	22	26
.40	2.49	.25	.17	16.50	7.10	19.81	.2	17	18
.26	2.16	.23	.24	15.80	6.10	18.69	.1	15	17
.72	3.05	.25	.39	16.90	7.00	21.31	.2	21	23
.31	.05	.04	0	3.27	.39	3.67	6.2	5	11
.24	.02	.02	0	2.44	.33	3.72	12.0	34	57
2.96	2.20	.26	0	4.10	.49	9.52	1.4	57	48
.36	.85	.12	0	3.81	.58	5.14	.4	26	31
.31	.33	.02	0	.78	0	1.44	.9	46	26
.58	1.15	.08	0	3.41	.23	5.30	.5	34	49
.34	1.84	.08	.01	6.03	2.97	8.29	.2	27	38
16.00	3.35	.38	.14	21.29	3.00	41.16	4.8	48	56
11.40	2.20	.09	.36	26.18	13.07	40.23	5.2	35	38
14.80	2.38	.13	.43	25.79	9.56	43.53	6.2	41	46
14.80	2.57	.86	.82	21.10	7.12	40.15	5.8	47	49
19.00	3.08	.23	1.11	20.81	9.80	44.23	6.2	53	55
26.60	4.02	.21	1.44	17.29	4.90	49.56	6.6	65	76
31.20	4.52	.17	1.78	15.24	1.50	52.91	6.9	72	78
34.30	4.55	.14	2.29	8.40	0	49.68	7.5	83	81
2.87	.03	(4)	0	3.83	.60	6.73	95.7	43	54
.80	.11	(4)	0	6.54	1.30	7.36	7.3	11	20
.74	.08	.10	0	11.03	2.70	11.95	9.3	8	16
.60	.03	.02	.01	6.52	3.20	7.17	20.0	9	12
.40	.13	.10	.01	8.49	2.80	9.12	17.8	7	9
21.40	.28	.23	0	.97	0	22.88	76.4	96	82
18.75	.07	.12	0	.10	0	19.04	267.9	99	81
15.70	.03	.10	0	.10	0	15.93	523.3	99	93
18.60	.03	.14	0	.10	0	18.87	620.0	99	116

TABLE 11.—*Chemical*

Soil type	MAES–SGM 68 sample number	Horizon	Depth from surface	Reaction	Organic matter	Cation exchange capacity by ammonium acetate
			Inches	*pH*	*Percent*	*Meq./100 gm. of soil*
Urbo silty clay loam	646	Ap	0–5	5. 3	1. 98	22. 0
	647	B21	5–12	4. 8	. 78	18. 0
	648	B22g	12–18	4. 6	. 46	20. 8
	649	B23g	18–55	4. 7	. 46	24. 5

[1] Extractable by 1*N* Ammonium Acetate (NH_4OAc) of pH 7. 0.
[2] Extractable by Barium Chloride—TEA.

Potassium, calcium, magnesium, and sodium were extracted from 25-gram soil samples with normal ammonium acetate buffered at pH 7.0 with ammonium hydroxide. Calcium, potassium, and sodium were then determined in the extract with a flame emission spectrophotometer. (Beckman DU Spectrophotometer.) Magnesium in the extract was determined by atomic absorption. The content of extractable cations is expressed in terms of milliequivalents per 100 grams of oven-dry (110 C.) soil.

The extractable hydrogen was determined by the barium chloride-triethanolamine method.

The aluminum was determined by potassium chloride extraction and titration with sodium hydroxide.

The sum of bases was determined by the 1 normal ammonium acetate method.

The percentage base saturation was calculated as follows:

$$\frac{\text{sum of bases}}{\text{CEC}} \times 100 = \text{percentage base saturation.}$$

The data on such chemical properties of soils as exchangeable cations and cation exchange capacities are usually expressed as milliequivalents per 100 grams of soil. Exchangeable cations are positive-charged elements that are electrostatically bonded to soil colloids, either clay minerals or organic-matter content (humus) that is negatively charged. The cation exchange capacity is a measure of the total amount of negative charge the soil contains and is equal to the sum of all exchangeable cations. Two cation exchange capacities are listed, one measured by ammonium acetate (NH_4OAc) at pH 7.0 and one measured by the sum of all exchangeable cations. The pH 7.0, NH_4OAc, exchange capacity is usually slightly lower because it does not include an increment of pH-dependent exchange capacity that appears as exchangeable hydrogen in the sum of all exchangeable cations.

In the average soil, the plow layer, or topsoil, to a depth of 6 2/3 inches, weighs 2,000,000 pounds. To convert milliequivalents of an element to the more practical pounds per acre, one first converts milliequivalents per 100 grams of soil to parts per million parts of soil, and then multiplies by a factor of 2. For the cations listed in table 11 the conversions are as follows:

Calcium (Ca)	meq./100 grams x 400 = pounds per acre
Magnesium (Mg)	meq./100 grams x 240 = pounds per acre
Potassium (K)	meq./100 grams x 780 = pounds per acre
Sodium (Na)	meq./100 grams x 460 = pounds per acre
Hydrogen (H)	meq./100 grams x 20 = pounds per acre
Aluminum (Al)	meq./100 grams x 180 = pounds per acre

Chemically then, 1 milliequivalent per 100 grams of soil equals 400 pounds per acre of calcium, which equals 1,000 pounds of pure calcium carbonate lime; 240 pounds of magnesium; 780 pounds of potassium; 460 pounds of sodium; 20 pounds of hydrogen; or 180 pounds of aluminum.

The exchangeable cations in a soil are electrostatically held against leaching, yet those cations so held that are plant nutrients are available to plants for growth. Soils can adsorb cations to the limit of their exchange capacity without risk of excess salt in the soil solution. Any of the exchangeable cations can be easily removed or replaced by substituting another cation for it. It is through this mechanism of cation exchange that soil acidity is corrected by liming and that soils become acid again after liming. Conditions are good for the growth of most plants when the cation exchange capacity of a soil is about 60 percent satisfied by calcium, 15 to 20 percent satisfied by magnesium, 5 percent satisfied by potassium, and not more than 20 percent satisfied by cations like sodium, hydrogen, and aluminum. If the exchangeable cation composition is like this, the soil pH should be between 6 and 7.

A division between nonacid soils and acid soils in the county can be made by extending a line across the county in a slightly northwest-southeast direction through the city of Starkville. Soils to the east of this line lie in the Blackland Prairie and are mostly nonacid, whereas soils to the west are mostly acid. Such a line is by no means a sharp division between the two reaction classes, as occasional area of acid soils cap ridgetops for several miles to the east, and areas of nonacid soils may be found in flood plains and on slopes for 2 to 3 miles *analysis of selected soils*—Continued

Exchangeable cations [1]				Extractable acidity [2]	Extractable aluminum [3]	Sum of bases and hydrogen	Calcium magnesium ratio	Base saturation	
Calcium	Magnesium	Potassium	Sodium					By sum of cations	By ammonium acetate
Meq./100 gm. of soil	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*		*Percent*	*Percent*
.36	3.95	.14	.01	22.08	1.61	26.56	.1	17	20
2.46	2.31	.37	.03	14.50	7.70	19.67	1.1	26	29
2.36	2.57	.24	.03	17.30	9.95	22.40	.9	23	25
1.46	3.65	.29	.06	22.20	8.00	27.66	.4	20	22

[3] Extractable by 1*N* Potassium Chloride.
[4] Trace.

to the west. Associated with each class of acidity are other major differences in chemical properties.

The soils of the Prairie to the east have high cation exchange capacities that arise from the abundant montmorillonite in their clays. Exchange capacities of the fine-textured Leeper, Catalpa, Brooksville, Houston, Sumter, and Binnsville soils range from 20 to 50 milliequivalents per 100 grams of soil. The percentage base saturation of these soils is typically high, often approaching 100 percent, and many of them contain free calcium carbonate. The Sumter and Binnsville soils are characteristically calcareous. As a general rule some free calcium carbonate is usually present when the soil pH exceeds 7.2. Quite often this carbonate exists in the soil as pea size or larger nodules that have been churned up from deeper layers as a result of the self mixing behavoir of these soils. A lot of the carbonate is brought to the soil surface by crayfish that prefer soils of Blackland Prairie and usually burrow into the underlying limy substratum.

The principal exchangeable cation in soils of Blackland Prairie is calcium. Magnesium, in contrast, is found in very small amounts. Frequently the level of magnesium saturation falls below 2 percent, and crop response to magnesium fertilization is widespread. The low magnesium content in these soils is directly traceable to the absence of magnesium minerals in the parent material. Numerous X-ray studies of these soils, and of the parent cretaceous sediments, show a complete absence of magnesium carbonates, as well as the predominance of clay minerals of the dioctahedral aluminous type.

The levels of exchangeable sodium and potassium in soils of Blackland Prairie are low. Sodium may occasionally exceed 1 milliequivalent per 100 grams in the deeper subsoil layers, but usually falls below 0.3 milliequivalents within the normal root zone. Potassium rarely exceeds 0.4 milliequivalents per 100 grams of soil, even when fertilization is heavy. Exchangeable potassium levels in these soils are strongly controlled by the potassium fixing properties of vermiculite, which is a common clay mineral. In some of the soils, potassium fixation is so great that crop response to potassium fertilizers may not be observed until very high rates are applied. Banding of fertilizer helps to assure availability of potassium. In spite of the high potassium-fixing properties of these soils, few acute potassium deficiencies have been observed in plants.

Because of their nonacid nature, soils of Blackland Prairie contain little or no exchangeable hydrogen and aluminum, and only small amounts of extractable acidity. Usually extractable acidity levels are equivalent to the differences between cation exchange capacities measured at pH 7, and those arrived at by the sum of bases plus extractable acidity.

The chemical properties of soils in central and western Oktibbeha County are quite variable because of the great variability in texture, mineralogy, and characteristics of parent materials. Soils like the Stough, Prentiss, Ruston, Ochlockonee, Mantachie, and Savannah have low to moderate cation exchange capacities. Most of these soils occur in the southern part and along the western edge of the county, although areas of Savannah soils appear throughout western Oktibbeha County. Cation-exchange capacities in soils like the Providence, Longview, and Mathiston are moderate, whereas those in the Wilcox, Sessum, and Urbo soils are moderate to high.

Many areas of central Oktibbeha County soils are transitional between soils of the Blackland Prairie (soils derived from Porter's Creek clay) and soils formed in sediments from the Clayton Formation. A striking change in levels of exchangeable calcium and magnesium, and in calcium to magnesium ratios, is noted between Blackland Prairie soils and the soils in central and western parts of the county. These Blackland Prairie soils have calcium to magnesium ratios usually well above 20 to 1, as compared to ratios below 2 to 1 for soils to the west. The increase in exchangeable magnesium in soils of the central and western parts of the county relates to a higher level of magnesium in the clay minerals of these soils.

Exchangeable potassium and sodium are generally lower in soils of west Oktibbeha County than in soils in the eastern part. Exchangeable aluminum, on the other hand, tends to be high in soils of the western part of the county, particularly in the soils like the Adaton and Boswell. Most of these soils have pH values below 5. The exchangeable aluminum contributes to high levels of extractable acidity, strong buffer capacities, and extremely high lime requirements. On some of these soils lime requirements are so high that landowners find it economically difficult to lime them to recommended pH levels.

Additional Facts About the County

This section was prepared for those seeking additional information about the county. It discusses early history and growth, geology, farming, climate, and other subjects of general interest.

Oktibbeha County was created by an act of the State Legislature on December 23, 1833. The county was named Oktibbeha, which in the Choctaw language means "Ice in Water." The area was part of the territory held in common by the Choctaw Indians. In March, 1831, through the Treaty of Dancing Rabbit, which was approved by Congress, the land was acquired.

The early settlers came from many States, but the majority came from Virginia, Tennessee, and South Carolina. The first county seat was Hebron. The central district developed rapidly, and Boardtown, later renamed Starkville, became the county seat in 1835. Starkville was named in honor of Gen. John Stark, a hero of the American Revolution.

At the time it was formed, Oktibbeha County had a population of about 4,000, and by the 1860 census, a population of 12,977. The estimated 1965 population was 30,756. The larger towns and their approximate populations in 1965 were Starkville, 13,500; Maben, 900; and Sturgis, 320. Smaller towns and communities are Longview, Osborn, Adaton, Clayton Village, Hickory Grove, and Oktoc.

Geology, Physiography, Relief, and Drainage [9]

The oldest sediments exposed in Oktibbeha County are a part of the Selma Group of Upper Cretaceous age, and consist of, from oldest to youngest, the Demopolis Chalk, the Ripley Formation, and the Prairie Bluff Chalk. These units are, in turn, overlain by sediments of Tertiary age belonging to the Clayton Formation, the Porters Creek Formation, and the Wilcox Formation. In the stream valleys one may encounter recent flood plain deposits, or perhaps older alluvial deposits associated with an earlier stage of drainage. Remnants of the latter deposits are more properly termed terrace deposits.

Cretaceous and Tertiary sediments crop out in bands of varying width extending north-northwest across the county. Each stratigraphic unit dips to the west-southwest at 20 to 40 feet per mile. Thus the oldest unit (Demopolis Chalk) is exposed in the eastern part of the county, and the youngest unit (Wilcox Formation) is present along the western boundary of the county (fig. 9).

The Demopolis Chalk is the main chalk body in the Selma Group. Although only a part of the total thickness of the Demopolis Chalk is included in Oktibbeha County, it forms the bedrock of a strip across the eastern part of the county. This strip ranges from about 1 mile on the south to about 10 miles at the boundary with Clay County to the north. The Demopolis Chalk is predominantly medium gray, massively bedded chalk and marl consisting largely of calcite in the form of microscopic fossils and, in addition, montmorillonitic clay with subordinate amounts of sand and mica. In the regions underlain by relatively pure chalks with less clay, bald spots are common and the soils are shallow. The exposed thickness is probably not more than 50 feet in Oktibbeha County.

The Ripley Formation is a relatively thin unit of very fine-grained calcareous sand and medium gray calcareous clay. It is probably not more than 70 feet thick.

The Prairie Bluff Formation is made up of medium gray, massively bedded chalk, and locally thin beds of light brown calcareous sandstone. Small masses of dark greenish-gray phosphatic material and grains of glauconite and quartz occur in variable amounts in all horizons. The thickness probably does not exceed 70 feet.

The Clayton Formation is a heterogeneous unit made up of light gray to greenish-gray, very fine-grained, glauconitic, thin bedded sand, and locally, may be composed of calcareous sandstone, chalk conglomerate, clay, or marl. It is very thin in most of the county except in the vicinity of Starkville, Miss., where it may be more than 20 feet thick.

The Porters Creek Formation is made up of olive-gray to dark-gray, massively bedded montmorillonitic clays that exhibit conchoidal fracture. The upper beds are thin, with partings of fine-grained glauconitic sand, and locally with large flattened concretions of siderite which formed on the surface layer to a form of limonite. Outcrops of Porters Creek clay are rare, due in large part to thin caps of terrace deposits of varying extent and to recent alluvium. Maximum thickness of the Porters Creek clay is probably more than 500 feet.

Along the Wilcox Cuesta in western Oktibbeha County, the Wilcox Formation consists of fine- to medium-grained, irregularly bedded quartz sand. Locally, it is interbedded with lenticular bodies of light-gray silty clay, and at the base there may be thin beds of bauxitic clay and clay-ball conglomerates. The exposed thickness probably does not exceed 100 feet in Oktibbeha County.

The alluvium occurs in the stream flood plains. It is composed of sediment.

Almost the entire northern half of Oktibbeha County lies within the Tibbee Creek drainage basin. This stream is formed by the junction of several major tributaries just north of the northeastern corner of Oktibbeha County. Within the county, the major streams draining into the Tibbee Creek system are Sun Creek, Trim Cane Creek, Sand Creek, and Catalpa Creek. The entire system drains eastward into the Tombigbee River approximately 10 miles upstream from Columbus, Mississippi.

Most of the southern half of Oktibbeha County is drained by the Noxubee River and its many tributaries that flow south and east into the Tombigbee River near Gainesville, Sumter County, Alabama.

Farming

Prior to 1923 the whole of Oktibbeha County was involved in farming, and the main crop was cotton. In recent years the number and proportion of farms has

[9] Prepared by Dr. Troy J. Laswell, head, geology and geography department and Dr. Ernest E. Russell, professor of geology and geography, Mississippi State University.

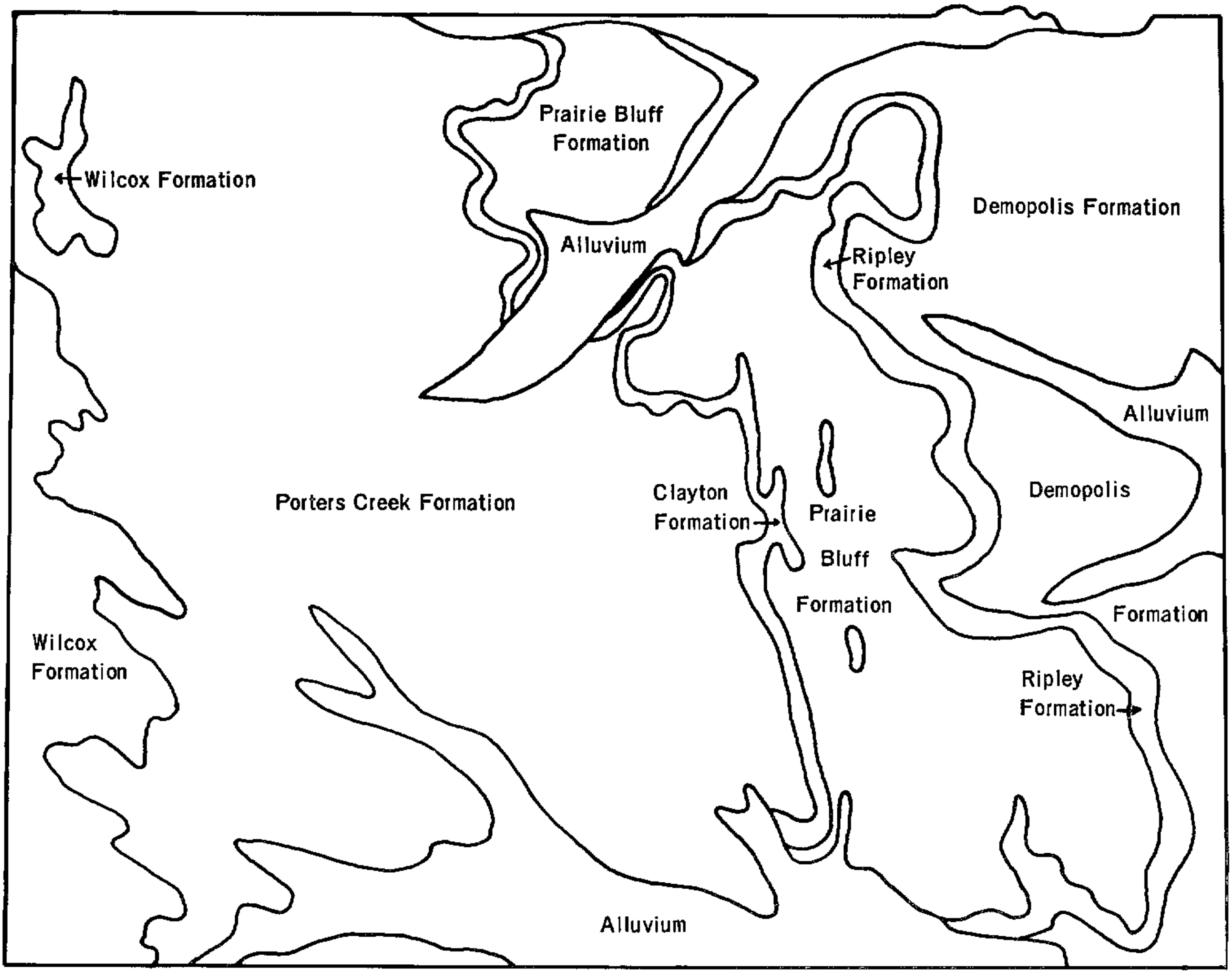

Figure 9.—**Generalized geologic map of Oktibbeha County.**

decreased, but the average size of the individual farm has increased. In 1964, 195,000 acres, or about 67 percent of the total county acreage, was in farms, compared to 74.2 percent in 1959 and 73.6 percent in 1954. In the same period the size of the average farm increased from 102 acres in 1954 to 153 acres in 1964.

Comparison of the U.S. Census of Agriculture figures for 1954, 1959, and 1964 shows that acreage of cotton and corn has decreased sharply and the acreage of silage and soybeans has increased. In 1964, 2,700 acres were in cotton, 5,000 were in grain corn, 2,600 were in silage, and 400 acres were used for soybeans. This compares with 3,000 acres of cotton in 1959 and 6,300 acres in 1954; 6,600 acres of corn for grain in 1959 and 11,600 acres in 1954; 2,000 acres of silage in 1959 and only 1,900 in 1954; and 100 acres of soybeans in 1959 and none in 1954. Some of the rich bottom land formerly used for cotton is now used for silage crops and soybeans.

The county had only 95 cotton farms in 1964, compared to 460 in 1954. There was also a sharp decrease in the number of dairy farms, from 460 in 1954 to 416 in 1959 and 334 in 1964. The number of farms used for livestock, however, rose from 52 in 1954 to 73 in 1964.

Industry and Transportation

In Oktibbeha County, there is a total of 11 industries that employ 1,077 people.

The county has four main improved roads: U.S. Highway No. 82, an east-west road through the northern half; State Route 12, a southwest-northeast road connecting Ackerman, Starkville, and Columbus; State Route 25, a northeast-south road connecting West Point, Starkville, and Louisville; State Route 289, a northwest road connecting Starkville and Pheba.

The Illinois Central Railroad serves the county. It extends from West Point through Starkville and connects with Ackerman. There are nine truck lines operating over U.S. Highway No. 82 and State Routes 12 and 25.

Electric power is furnished by the Tennessee Valley Authority.

There is adequate water supply for all needs available everywhere, but the depth at which it is obtained ranges from 700 to 900 feet. There are public water systems in Starkville, Maben, and Sturgis. The water supply comes from wells in the Tuscaloosa and Eutaw Formations. Domestic supplies are developed chiefly in the Eutaw Formation and the Ripley Formation in the eastern two-thirds of the county and in the Wilcox Group in the western third. Power pumps and cisterns supply most of the water for homes in the rural areas. There are 17 community water systems in the county that serve 1,440 families. Water for livestock is supplied by streams and ponds.

Climate

Oktibbeha County has a warm humid climate that is influenced by the subtropical latitude, the huge land mass to the north, and the warm waters of the Gulf of Mexico some distance to the south. Local modifications are caused by variations in the topography.

Temperatures range from an average low of about 46.4° F. in January to an average high of about 81.4° in July. Rainfall averages about 50.83 inches per year. Table 12 shows data on temperature and precipitation at State College, Mississippi. (Data taken from records kept by the Agricultural Engineering Department, Mississippi State University.)

The temperature falls to 32°, or freezing, on an average of 50 days in the winter and rises to 90° or higher on an average of 90 days in the summer. The lowest temperature ever recorded was –8° in February, in 1899, and the highest was 111°.

The latest frost recorded in spring occurred on March 30, and the earliest in the fall on October 30. The average date of the last killing frost in the spring is March 25, and the average first date in fall is November 6. The average frost-free period is 226 days (*8*).

If the sky is clear and the air is calm, frost can form near the ground at night and adversely affect seeds in beds and young plants, even though the temperature registered on a thermometer in a shelter 5 feet above the ground is higher than 32°. On cold windy nights, the temperature on hilltops is the same as, or lower than, it is in the valleys; but on clear, calm nights the temperature is likely to be considerably lower in the valleys and in open country than it is on the hilltops and in the large towns.

Winter and spring are the wettest seasons; fall is the driest. Dry weather in fall is especially beneficial to harvesting operations and to the planting of winter grain. In an unusually dry fall, germination of grain is hindered at times or planting is delayed too long. Rains in winter and spring may last for several days, but they normally occur as brief showers along the leading edge of a mass of cold air. Rains in summer come as local thundershowers that may bypass one area for days and even weeks and bring to another area enough moisture for crops. Dry weather and plentiful sunshine during the summer are especially beneficial to cotton.

The wettest year recorded was 1912, when 76.27 inches of rain fell, and the driest year was 1952, which had a total rainfall of 31.32 inches. The wettest month was July 1940, when 16.00 inches of rain was recorded. October is normally the driest month of the year, and March is normally the wettest month of the year.

Snow is of little economic importance in most years, but about 14 inches of snow fell on February 13, 1960, the heaviest snowfall ever recorded in the area. When snow does fall, it seldom remains on the ground for any considerable length of time and occasionally no measurable amount is reported during an entire year.

Relative humidity is high both in winter and summer. It is 80 percent or higher in 36 percent of the hours in which the temperature is below 50° F. It never exceeds

TABLE 12.—*Normal monthly temperature and precipitation*

[Data from records kept at State College, Mississippi. Temperature data for period 1910–1962. Precipitation data for period 1889–1962]

Month	Temperature			Average precipitation
	Average	Average maximum	Average minimum	
	°F.	*°F.*	*°F.*	*Inches*
January	46.4	56.8	36.1	5.15
February	49.5	60.6	38.5	4.93
March	55.5	66.9	44.1	6.16
April	63.8	75.6	51.9	4.56
May	71.4	83.3	60.0	4.04
June	79.1	90.5	67.6	3.96
July	81.4	92.5	70.3	4.74
August	80.9	92.3	69.5	3.53
September	76.1	88.1	64.2	2.68
October	65.7	78.3	53.2	2.51
November	54.0	65.7	42.3	3.61
December	47.3	57.5	37.0	4.96
Year				50.83

79 percent when the temperature is 90° or higher, but it ranges from 50 to 79 percent for 26 percent of the time when the temperature is 90° or higher. The relative humidity in Oktibbeha County is less than 50 percent in about three-fourths of the hours that have a temperature of 90° or higher.

Records from 1875 to 1959 indicate that tropical storms and hurricanes have never caused winds of gale or hurricane force in Oktibbeha County, although heavy rains as a result of these storms have caused floods and have ruined unharvested crops. Records indicate that on the average there are two to four tornadoes about every 40 years in Oktibbeha County.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as crumbs, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

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 clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Claypan. A compact, slowly permeable soil horizon that contains more clay than the horizons above and below it. A claypan is commonly hard when dry and plastic or stiff when wet.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottlings below 6 to 16 inches, in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic matter and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Genesis, soil. The manner in which a soil originates. Refers especially to the processes initiated by climate and organisms that are responsible for the development of the solum, or true soil, from the unconsolidated parent material, as conditioned by relief and age of landform.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Leached soil. A soil from which most of the soluble material have been removed from the entire profile or have been removed from one part of the profile and have accumulated in another part.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineralogical, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on relatively steep slopes and in swelling clays, where there is marked change in moisture content.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Substratum. Technically the part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.