SOIL SURVEY OF

Jasper County, Mississippi

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

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all who need the information, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1968–73. Soil names and descriptions were approved in 1974. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1974. This survey was made cooperatively by the Soil Conservation Service, the Forest Service, and the Mississippi Agricultural and Forestry Experiment Station. It is part of the technical assistance furnished to the Jasper County Soil and Water Conservation District.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms, woodlands, and wildlife areas; 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 Jasper County are shown on the detailed map at the back of this publication. 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

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 the woodland suitability groups.

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

Wildlife managers and others can find information about soils and wildlife in the section "Wildlife habitat."

Community planners and others can read about soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the sections "Sanitary facilities" and "Building site development."

Engineers and builders can find, under "Engineering Uses of the Soils," 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, morphology, and classification of the soils."

Newcomers in the area 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 in the section "General nature of the county."

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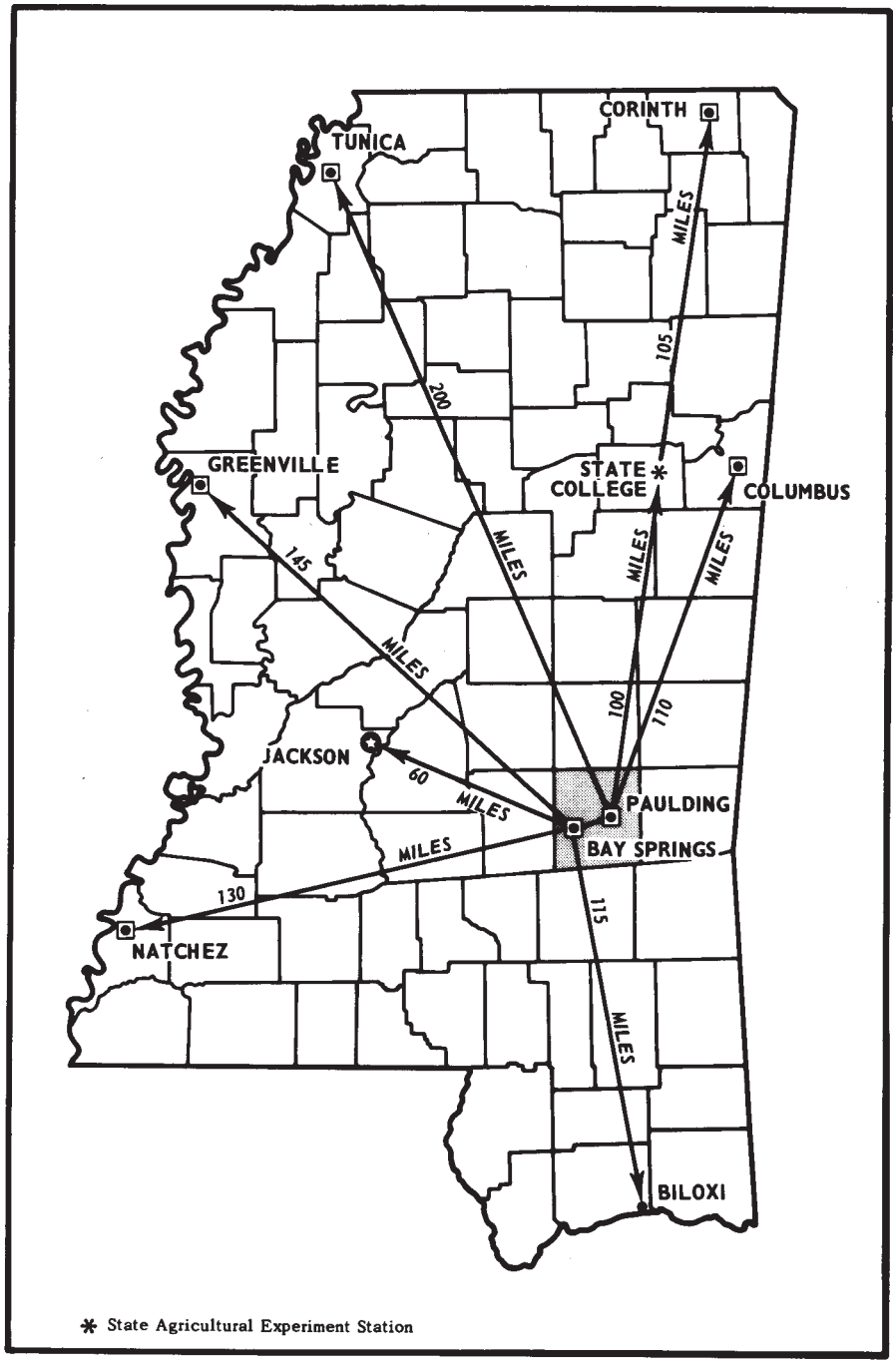

Location of Jasper County in Mississippi

SOIL SURVEY OF JASPER COUNTY, MISSISSIPPI

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FIELDWORK BY HUEL L. NEAL AND VELTON C. ALLGOOD, SOIL CONSERVATION SERVICE

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

JASPER COUNTY is in the southeastern part of Mississippi (see map on facing page). It has a land area of 437,120 acres of 683 square miles. The county is divided into two judicial districts. Paulding is the county seat of the first judicial district, and Bay Springs is the county seat of the second judicial district.

The landscape of the county is hilly and broken in the eastern part and gently sloping, undulating, and rolling in the other parts. The major creeks in the county are the Souinlovey, Tallahala, Tallahoma, and Etehoma. These creeks and their tributaries provide drainage for most of the county.

The main farm crops in Jasper County are cotton, corn, soybeans, small grain, and pasture. Beef cattle, dairy cattle, and poultry are the main kinds of livestock raised in the county. Forest products are an important source of income. Cotton, once the leading crop, has declined in recent years in favor of other crops.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in Jasper 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. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have a profile 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. Louin and Shubuta, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer 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, Ora fine sandy loam, 2 to 5 percent slopes, eroded, is one of several phases within the Ora 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—soil complexes and soil associations—are shown on the soil map of Jasper County.

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 com-

plex consists of the names of the dominant soils, joined by a hyphen. Kirkville-Mantachie complex is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. There is a considerable degree of uniformity in pattern and relative extent of the dominant soils, but the soils may differ greatly one from another. The name of an association consists of the names of the dominant soils, joined by a hyphen. Smithdale-Lucy association, hilly, is an example.

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 range, 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 the survey area. A soil association is a landscape that has a distinctive pattern of soils in defined proportions. It typically consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in an association can occur in other associations, but in different patterns.

A map showing soil associations is useful to people who want to have a general idea of the soils in a survey area, who want to compare different parts of that area, or who want to locate large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide for broad planning on a watershed, a wooded tract, or a wildlife area or for broad planning of recreational facilities, community developments and such engineering works as transportation corridors. It is not a suitable map for detailed planning for management of a farm or field or for selecting the exact location of a road or building or other structure, because the soils within an association ordinarily vary in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The soil associations in this survey have been grouped into general kinds of landscapes for broad interpretative purposes. Each of the broad groups and the soil associations in it are described on the following pages.

Areas dominated by soils on flood plains

This group consists of two soil associations. The soils are on flood plains. They are nearly level and are subject to flooding.

1. Bibb-Mantachie-Kirkville association

Poorly drained to moderately well drained, loamy soils

This association is along major streams in the southern part of the county. It occupies about 10 percent of the county. This association is about 30 percent Bibb soils, 22 percent Mantachie soils, and 21 percent Kirkville soils. The rest is Bassfield, Dorovan, Jena, Leeper, and Stough soils.

Bibb soils are mainly in long, low-lying areas adjacent to uplands. They are poorly drained. They have a surface layer of dark gray fine sandy loam about 5 inches. The underlying material is gray sandy loam that has yellowish brown and brownish yellow mottles.

Mantachie soils are in long, wide areas adjacent to the larger streams. They are somewhat poorly drained. They have a surface layer of dark grayish brown loam about 2 inches thick. The subsurface layer is yellowish brown loam about 4 inches thick. The next layer, about 6 inches thick, is yellowish brown loam that has light brownish gray mottles. It overlies mottled yellowish brown, light brownish gray, and strong brown loam about 5 inches thick. The next layer, to a depth of 32 inches, is gray loam that has strong brown mottles. Below this layer, to a depth of 55 inches, is gray sandy clay loam that has brown mottles.

Kirkville soils are in long, wide areas adjacent to the larger streams. They are moderately well drained. They have a surface layer of dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is dark brown fine sandy loam about 7 inches thick. The upper part of the subsoil, to a depth of about 26 inches, is brown fine sandy loam that has grayish and brownish mottles in the lower part. The lower part of the subsoil is mottled gray, brown, and dark yellowish brown fine sandy loam to a depth of about 50 inches. The underlying material, to a depth of about 70 inches, is gray fine sandy loam that has dark yellowish brown mottles.

Almost all of this association is in woodland. Small areas have been cleared and are in pasture.

Most areas of this association are subject to severe flooding and are therefore better suited to woodland than to most other uses. Because of the hazard of flooding, this association is poorly suited to row crops and is limited for residential uses.

The streams and woodland in this association provide opportunities for fishing and hunting. The game is mainly turkey, deer, squirrel, and duck.

2. Urbo-Marietta-Una association

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

This association is along major streams on wide,

nearly level flood plains in the northern part of the county. It occupies about 4 percent of the county. This association is about 48 percent Urbo soils, about 28 percent Marietta soils, and about 10 percent Una soils. The rest is Adaton, Leeper, and Mantachie soils.

Urbo soils are on higher parts of the landscape adjacent to the larger streams. They are somewhat poorly drained. They have a surface layer of dark brown silty clay loam about 6 inches thick. The subsoil, to a depth of 16 inches, is dark yellowish brown silty clay that has light brownish gray mottles. The lower part of the subsoil, to a depth of 65 inches, is gray silty clay that has mottles in shades of red and brown.

Marietta soils are on higher parts of the landscape adjacent to the larger streams. They are moderately well drained. They have a surface layer of dark grayish brown silt loam about 6 inches thick. The subsoil, to a depth of 18 inches, is dark brown loam that has grayish brown mottles. The lower part of the subsoil, to a depth of 46 inches, is mottled light brownish gray and yellowish brown sandy clay loam. The underlying material is gray sandy clay loam that has yellowish brown mottles.

Una soils are in low-lying areas near the uplands and along the smaller streams. They are poorly drained. They have a surface layer of dark gray silty clay loam about 4 inches thick. The subsoil, to a depth of 65 inches, is gray silty clay that has brownish mottles.

Almost all of this association is in hardwood trees. Small areas have been cleared and are used for pasture.

Most of this association is suited to hardwood trees and pasture, if proper drainage is provided. Because of the hazard of flooding, most of this association is poorly suited to row crops and has limitations for residential uses.

The streams and woodlands in this association provide opportunities for fishing and hunting. The game is mainly turkey, deer, squirrel, and duck.

Areas dominated by soils on uplands

This group consists of five soil associations. The soils are mostly on uplands. They are dominantly acid.

3. Sweatman-Shubuta-Susquehanna association

Well drained and somewhat poorly drained, gently sloping to strongly sloping soils that have a mostly clayey subsoil

This association is mostly in gently sloping to strongly sloping areas in the southern and eastern parts of the county. It occupies about 8 percent of the county. This association is about 30 percent Sweatman soils, 30 percent Shubuta soils, and 20 percent Susquehanna soils. The rest is Boswell, Mantachie, Ruston, and Smithdale soils.

Sweatman soils are in areas near the tops of slopes. These soils are sloping to strongly sloping. They are well drained. They have a surface layer of dark grayish brown fine sandy loam about 5 inches thick. The upper part of the subsoil, to a depth of about 18 inches, is yellowish red clay; the lower part, to a depth of 42 inches, is yellowish red clay that has brownish mottles. The underlying material, to a depth of about 70 inches, is stratified layers of red, brown, yellow, and gray weathered shale, clay, and sandy loam.

Shubuta soils are on long, narrow ridgetops that are 200 to 1,000 feet wide. These soils are gently sloping. They are well drained. They have a surface layer of dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is yellowish red clay loam about 10 inches thick. The next layer, to a depth of about 33 inches, is red clay. The lower part of the subsoil, to a depth of about 70 inches, is mottled red, brown, and gray clay loam to clay.

Susquehanna soils are in areas on the lower part of slopes. These soils are sloping to strongly sloping. They are somewhat poorly drained. They have a surface layer of dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is grayish brown fine sandy loam about 4 inches thick. The upper part of the subsoil is red clay about 17 inches thick that has light brownish gray mottles in the lower part. The lower part of the subsoil is mottled gray, red, and brown clay to a depth of about 70 inches.

Most of this association is woodland. Small areas on the ridgetops are in row crops and pasture. Most of the farms are tree farms and have a small cleared acreage. The farms average 100 to 200 acres in size. Most are operated mainly on a part-time basis by the owner.

The gently sloping and sloping soils in this association are suited to row crops and pasture. The steeper areas are better suited to pine trees than to most other uses.

The woodland in this association provides opportunities for hunting deer, quail, turkey, and squirrel.

4. Savannah-Stough-Prentiss association

Moderately well drained, nearly level to gently sloping, loamy soils that have a fragipan, and somewhat poorly drained, nearly level, loamy soils

This association is in small areas throughout the county. The areas are dissected by numerous small narrow drainageways. This association occupies about 12 percent of the county. It is about 50 percent Savannah soils, 15 percent Stough soils, and 12 percent Prentiss soils. The rest is Adaton, Bibb, and Ora soils.

Savannah soils are on higher elevations. They are moderately well drained. They have a surface layer of dark grayish brown fine sandy loam about 6 inches thick. The upper part of the subsoil is yellowish brown loam about 24 inches thick. The lower part of the subsoil, to a depth of about 50 inches, is firm, compact, brittle loam that is mottled in shades of yellow, brown, and gray. Below this, to a depth of 65 inches, is firm, compact, brittle clay loam that is mottled in shades of yellow, brown, and gray.

Stough soils are on lower elevations. They are somewhat poorly drained. They have a surface layer of grayish brown fine sandy loam about 7 inches thick. The upper part of the subsoil, to a depth of 16 inches, is light yellowish brown to pale brown fine sandy loam that has grayish and brownish mottles. The next layer, to a depth of 39 inches, is mottled pale brown, gray, and yellowish brown loam. The lower part of the subsoil, to a depth of 70 inches, is sandy clay loam that is mottled in shades of gray and brown.

Prentiss soils are on lower elevations. They are moderately well drained. They have a surface layer of dark

gray fine sandy loam about 3 inches thick. The subsurface layer is grayish brown fine sandy loam about 3 inches thick. The upper part of the subsoil is light yellowish brown fine sandy loam about 6 inches thick over yellowish brown loam about 13 inches thick. The lower part of the subsoil, to a depth of 30 inches, is a light yellowish brown fine sandy loam fragipan that has light brownish gray mottles. Below this, to a depth below 46 inches, is a fine sandy loam fragipan that is mottled in shades of brown and gray. To a depth of 60 inches it is mottled brown, gray, and red loam.

The farms in this association range from 100 to 200 acres in size. Row crops are in small areas. About two-thirds of the association is crops and pasture. About one-third is woodland.

The soils of this association are suited to most cultivated crops and pasture plants. They are well suited to pine trees. Most of the association is fairly well suited to commercial and residential buildings, parks, and other recreational facilities. Poor surface drainage in places, depth of soil, and a high water table are limitations to use of the soils.

The fields and woodland provide opportunities for hunting. The game is mainly quail, rabbit, squirrel, and deer.

5. Vaiden-Freest-Louin association

Nearly level to gently sloping, somewhat poorly drained, clayey soils and moderately well drained, loamy soils

This association is mostly in the northern one-third of the county. It occupies about 18 percent of the county. This association is 40 percent Vaiden soils, 22 percent Freest soil, and 13 percent Louin soils. The rest is Adaton, Okolona, and Sumter soils.

Vaiden soils are in broad areas that range from ⅛ to 1 mile in width. The areas are dissected with small very narrow bottoms. These soils are nearly level to gently sloping. They are somewhat poorly drained. They have a surface layer of brown silty clay loam about 2 inches thick. The upper part of the subsoil, to a depth of 11 inches, is yellowish brown clay that has yellowish red and pale brown mottles. The lower part of the subsoil, to a depth of about 24 inches, is mottled brown and gray clay. The underlying material, to a depth of 58 inches, is mottled brown, gray and red clay. Below this, to a depth of 68 inches, is gray marly clay that has yellowish red mottles.

Freest soils are in broad areas that range from ⅛ to 1 mile in width. The areas are dissected with small very narrow bottoms. These soils are nearly level to gently sloping. They are moderately well drained. They have a surface layer of dark grayish brown fine sandy loam about 2 inches thick over a subsurface layer of brown fine sandy loam about 4 inches thick. The subsoil is yellowish brown loam about 9 inches thick over mottled brownish and grayish clay loam that extends to a depth of 80 inches.

Louin soils are in broad areas that have gilgai relief. The areas range from ⅛ to 1 mile in width. These soils are nearly level. They are somewhat poorly drained. They have a surface layer of very dark grayish brown silty clay loam about 2 inches thick. The next layer, to a depth of about 7 inches, is yellowish brown silty clay that has grayish and brownish mottles and below this, to a depth of 60 inches, it is mottled brownish and grayish clay. The underlying material, to a depth of 90 inches, is yellowish brown clay that has gray mottles.

Most of this association is woodland. A few small farms are scattered throughout the area. Small acreages have been cleared and are in crops and pasture. About one-third of the association is in the Bienville National Forest. Most of the remainder is owned by large timber companies.

Most of the association is suited to row crops and pasture. The soils are well suited to pine trees and adapted hardwoods. Because of the fine texture and poor drainage of the soils, much of this association is poorly suited to commercial and residential building and to parks and other recreational facilities.

The woodland and open areas provide opportunities for hunting. The game is mainly deer, turkey, squirrel, rabbit, and quail.

6. Heidel-Troup-McLaurin association

Gently sloping to steep, well drained, loamy soils and well drained, loamy soils that have a thick, sandy surface layer

This association is mostly in the eastern and southern parts of the county. The area is dissected by heads of numerous drainageways that have narrow stream bottoms. The association occupies about 17 percent of the county. It is about 34 percent Heidel soils, 16 percent Troup soils, and 16 percent McLaurin soils. The rest is Lakeland and Lucy soils.

Heidel soils are in areas 200 to 500 feet long. These soils are steep. They are well drained. They have a surface layer of dark grayish brown sandy loam about 4 inches thick. The subsurface layer is brown sandy loam about 7 inches thick. The upper part of the subsoil is yellowish red fine sandy loam about 7 inches thick over red loam to a depth of 46 inches. The lower part of the subsoil is red fine sandy loam to a depth of 80 inches.

Troup soils are in areas 200 to 500 feet long. These soils are steep. They are well drained. They have a surface layer of dark grayish brown loamy sand about 7 inches thick. The subsurface layer is brown sand about 52 inches thick. The upper part of the subsoil is yellowish red sandy loam about 8 inches thick. The lower part of the subsoil, to a depth of about 88 inches, is red sandy loam.

McLaurin soils are on long, narrow ridgetops. Areas are generally 100 to 200 feet wide and ¼ mile long or longer. These soils are well drained. They have a surface layer of dark brown loamy sand about 3 inches thick. The subsurface layer is yellowish brown loamy sand about 7 inches thick. The upper part of the subsoil is red sandy loam about 28 inches thick; the middle part is yellowish red sandy loam about 9 inches thick; and the lower part, to a depth of 80 inches, is red sandy loam.

Most of this association is in woodland. Small scattered areas have been cleared and are used for pasture and crops. Most of the woodland is pine trees and scattered hardwood trees. In this association timber companies own large tracts of timber.

This association is well suited to pine trees. Ridgetops are suited to cultivated crops, but erosion is a hazard. The less steep slopes are suited to pasture.

The woodland and open areas in this association provide opportunities for hunting. The game is mainly turkey, deer, squirrel, rabbit, and quail.

7. Sweatman-Smithdale-Ora association

Steep, well drained soils that have a clayey and loamy subsoil, and sloping, moderately well drained, loamy soils that have a fragipan

This association is throughout the county. It occupies about 31 percent of the county. This association is about 27 percent Sweatman soils, 20 percent Smithdale soils, and about 18 percent Ora soils. The rest is Lucy, McLaurin, and Ruston soils.

Sweatman soils are in areas that are dissected by numerous small drainageways. These soils are sloping; slopes are short. They are well drained. They have a surface layer of dark grayish brown fine sandy loam about 5 inches thick. The subsoil is yellowish red clay about 13 inches thick over yellowish red clay that has brownish mottles to a depth of 42 inches. The underlying material, to a depth of about 70 inches, is stratified layers of red, brown, yellow, and gray weathered shale, clay, and sandy loam.

Smithdale soils are in areas that are dissected by numerous small drainageways. These soils are sloping; slopes are short. The soils are well drained. They have a surface layer and a subsurface layer of dark brown fine sandy loam about 10 inches thick. The upper part of the subsoil is red sandy clay loam about 25 inches thick. The lower part of the subsoil, to a depth of about 80 inches, is red sandy loam.

Ora soils are on long narrow ridgetops that are less than 1,000 feet wide. These soils are gently sloping and moderately sloping. They are moderately well drained. They have a surface layer of brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red clay loam about 14 inches thick over yellowish red loam about 9 inches thick. The lower part of the subsoil is a yellowish red, firm, compact, brittle loam fragipan that has brownish and grayish mottles to a depth of 40 inches. Below this layer, to a depth of 70 inches, is a firm, compact, brittle loam fragipan that is mottled in shades of gray, red, and brown.

About half of this association is woodland and half is in pasture and crops. Most of the area in the southwestern part of the county is in crops and pasture. The woodland is scattered throughout the association. The farms average 100 to 200 acres in size. Timber companies own several large tracts of timberland.

The ridgetops are suited to cultivated crops and pasture, but erosion is a hazard. The side slopes are generally suited to pasture and pine trees. Commercial and industrial buildings and recreational areas are generally suited to much of this area. Slope, texture, and depth of soil are limitations that should be considered.

Numerous private ponds and lakes in the association provide opportunities for fishing. Woodland and openland areas provide opportunities for hunting. The game is mainly quail, deer, turkey, rabbit, and squirrel.

Descriptions of the soils

This section describes each soil series in detail and then, briefly, each mapping unit in that series. Unless stated otherwise, what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface down to rock or other underlying material. Each series contains two descriptions of the profile. The first is brief and in terms familiar to a layman. The second is more detailed and is included for those who need to make thorough and precise studies of soils. The profile described in the series is representative for mapping units in that series. If the profile of a given mapping unit is different from the one described for the series, these differences are stated in describing the mapping unit, or they are differences that are apparent in the name of the mapping unit. Color terms are for moist soil unless otherwise stated.

Preceding the name of each mapping unit is a symbol that identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland suitability group in which the mapping unit has been placed. An explanation of the capability classification system is given in the section "Capability grouping." A discussion of woodland suitability groups is given in the section "Woodland."

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*12*).[1]

Adaton series

The Adaton series consists of poorly drained soils on uplands. The soils formed in loamy material and are high in silt content.

In a representative profile the surface layer is dark grayish brown silt loam about 4 inches thick over a subsurface layer of light brownish gray silt loam about 5 inches thick. The upper part of the subsoil, to a depth of about 34 inches, is gray silt loam that has brownish mottles. The lower part of the subsoil is gray silty clay loam that has strong brown and yellowish red mottles.

Representative profile of Adaton silt loam, 7 miles northwest of Montrose, ¾ mile north of Quarterliah Creek, and 50 feet east of road, SE¼SW¼ sec. 9, T. 4 N., R. 10 E.:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots; very strongly acid; abrupt wavy boundary.

A2g—4 to 9 inches; light brownish gray (10YR 6/2) silt loam; few medium distinct yel-

[1] Italic numbers in parentheses refer to References, p. 84.

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

Soil	Acres	Percent
Adaton silt loam	3,980	0.9
Bassfield fine sandy loam, 2 to 5 percent slopes	660	.2
Bibb fine sandy loam, frequently flooded	14,630	3.3
Boswell fine sandy loam, 2 to 5 percent slopes	3,030	.7
Boswell fine sandy loam, 5 to 8 percent slopes	720	.2
Dorovan muck	150	(1)
Freest fine sandy loam, 0 to 2 percent slopes	4,060	.9
Freest fine sandy loam, 2 to 5 percent slopes	9,930	2.3
Freest fine sandy loam, 5 to 8 percent slopes	3,920	.9
Heidel sandy loam, 8 to 12 percent slopes	3,920	.9
Heidel sandy loam, 12 to 30 percent slopes	5,520	1.3
Heidel-Troup association, hilly	39,930	9.2
Jena sandy loam, frequently flooded	970	.2
Kirkville-Jena association, frequently flooded	11,140	2.6
Kirkville-Mantachie complex	13,510	3.1
Lakeland sand, 5 to 12 percent slopes	3,810	.9
Lakeland sand, 12 to 30 percent slopes	2,490	.6
Leeper silty clay	1,440	.3
Louin silty clay loam	11,440	2.6
Mantachie-Mathiston association, frequently flooded	19,810	4.5
Marietta silt loam	5,950	1.4
McLaurin loamy sand, 2 to 5 percent slopes	6,920	1.6
McLaurin loamy sand, 5 to 8 percent slopes	6,500	1.5
Okolona clay, 1 to 3 percent slopes, eroded	1,060	.2
Ora fine sandy loam, 2 to 5 percent slopes, eroded	6,420	1.5
Ora fine sandy loam, 5 to 8 percent slopes, eroded	15,400	3.5
Ora fine sandy loam, 8 to 12 percent slopes, eroded	3,190	.7
Prentiss fine sandy loam, 0 to 2 percent slopes	3,670	.8
Prentiss fine sandy loam, 2 to 5 percent slopes	2,700	.6
Ruston fine sandy loam, 2 to 5 percent slopes	4,590	1.1
Ruston fine sandy loam, 5 to 8 percent slopes	8,850	2.0
Savannah fine sandy loam, 0 to 2 percent slopes	960	.2
Savannah fine sandy loam, 2 to 5 percent slopes	13,800	3.2
Savannah fine sandy loam, 5 to 8 percent slopes	13,050	3.0
Shubuta fine sandy loam, 2 to 5 percent slopes, eroded	1,900	.4
Shubuta fine sandy loam, 5 to 8 percent slopes	9,240	2.1
Smithdale fine sandy loam, 8 to 12 percent slopes, eroded	12,350	2.8
Smithdale fine sandy loam, 15 to 25 percent slopes	8,200	1.9
Smithdale-Lucy association, hilly	13,280	3.0
Stough fine sandy loam	8,130	1.9
Sumter clay, 2 to 8 percent slopes, eroded	5,860	1.3
Sumter clay, 8 to 12 percent slopes, eroded	1,440	.3
Susquehanna fine sandy loam, 2 to 5 percent slopes	2,150	.5
Susquehanna fine sandy loam, 5 to 8 percent slopes, eroded	4,930	1.1
Sweatman fine sandy loam, 8 to 17 percent slopes, eroded	26,800	6.1
Sweatman association, hilly	19,910	4.6
Sweatman-Smithdale association, hilly	22,420	5.1
Sweatman-Smithdale complex, 8 to 20 percent slopes, eroded	5,380	1.2
Troup loamy sand, 8 to 12 percent slopes	840	.2
Una-Urbo complex, frequently flooded	3,920	.9
Urbo association, frequently flooded	9,830	2.3
Vaiden silty clay loam, 2 to 5 percent slopes	19,650	4.5
Vaiden silty clay loam, 5 to 8 percent slopes	11,800	2.7
Vaiden silty clay loam, 8 to 12 percent slopes, eroded	970	.2
Total	437,120	100.0

[1] Less than 0.05 percent.

lowish brown (10YR 5/8) mottles; weak medium granular structure; friable; strongly acid; abrupt wavy boundary.

B21tg—9 to 26 inches; gray (10YR 6/1) silt loam; many medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; few thin clay films; silt coatings on faces of peds; very strongly acid; gradual wavy boundary.

B22tg—26 to 34 inches; gray (10YR 6/1) silt loam; few medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm, slightly plastic and sticky; patchy clay films on peds; very strongly acid; gradual wavy boundary.

B23tg—34 to 46 inches; gray (10YR 6/1) silty clay loam; few coarse distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm, slightly plastic; clay films on peds; strongly acid; gradual wavy boundary.

B24tg—46 to 65 inches; gray (10YR 6/1) silty clay loam; many coarse distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm, slightly plastic; clay films on peds; strongly acid; gradual wavy boundary.

B25tg—65 to 85 inches; gray (10YR 6/1) silty clay loam; many medium prominent yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; firm, plastic; clay films on peds; very strongly acid.

The profile is strongly acid to very strongly acid.

The A1 horizon is dark grayish brown or dark gray. The Ap or A2 horizon is grayish brown or light brownish gray.

The B horizon is silt loam, silty clay loam, or silty clay. The upper 20 inches of the B horizon averages 20 to 32 percent clay and 35 to 55 percent silt. The B2g horizon ranges from gray to light brownish gray and has few to many mottles in shades of yellow, red, and brown.

Adaton soils are associated with Freest and Stough

soils. They are more poorly drained than Freest and Stough soils.

Ad—Adaton silt loam. This poorly drained soil is on broad upland flats. Slopes are 0 to 2 percent.

Included with this soil in mapping are small areas of Freest and Stough soils.

This soil is very strongly acid or strongly acid. Permeability is slow, and available water capacity is very high. Runoff is slow. In a few areas ponding occurs, but the surface water can be removed by field ditches. Proper use of crop residue and sod crops maintains tilth and reduces crusting and packing.

Most areas of this soil are in woodland. A few small areas are in pasture and crops. Because of a high water table and slow runoff, this soil is better suited to pasture plants and adapted hardwoods and pine trees than to most other uses. If proper drainage is provided, this soil is suited to cotton, corn, and soybeans. Capability unit IIIw–2; woodland suitability group 2w9.

Bassfield series

The Bassfield series consists of well drained soils on uplands. The soils formed in loamy materials.

In a representative profile the surface layer is dark brown fine sandy loam about 8 inches thick. The subsoil, to a depth of 45 inches, is yellowish red sandy loam. The underlying material extends to a depth of 80 inches. The upper 23 inches is reddish yellow loamy sand, and the lower 12 inches is pale brown sand.

Representative profile of Bassfield fine sandy loam, 2 to 5 percent slopes, 1 mile east of Rose Hill and ⅜ mile north of State Highway 513, SW¼SE¼ sec. 28, T. 4 N., R. 13 E.:

Ap—0 to 8 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

B1—8 to 13 inches; yellowish red (5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; many fine and medium roots; some mixing of A horizon; strongly acid; gradual smooth boundary.

B21t—13 to 25 inches; yellowish red (5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; few fine roots; bridging and coating of sand grains with clay and oxides; strongly acid; gradual smooth boundary.

B22t—25 to 40 inches; yellowish red (5YR 4/8) sandy loam; weak medium subangular blocky structure; friable; few fine roots; bridging and coating of sand grains with clay and oxides; strongly acid; gradual smooth boundary.

B3—40 to 45 inches; yellowish red (5YR 4/8) sandy loam; weak medium subangular blocky structure; very friable; few pockets of uncoated sand grains; very strongly acid; gradual wavy boundary.

C1—45 to 68 inches; reddish yellow (5YR 6/6) loamy sand; single grained; loose; very strongly acid; gradual wavy boundary.

C2—68 to 80 inches; pale brown (10YR 6/3) sand; single grained; loose; very strongly acid.

The thickness of the solum and depth to the sandy C horizon range from 40 to 60 inches. The profile is strongly acid or very strongly acid.

The A horizon is dark brown, brown, or dark grayish brown.

The Bt horizon is yellowish red or red sandy loam or loam. The upper 20 inches of the B horizon is 8 to 16 percent clay.

The C horizon is reddish yellow or pale brown loamy sand or sand.

Bassfield soils are associated with Prentiss soils. They have no fragipan, whereas Prentiss soils have a fragipan.

BaB—Bassfield fine sandy loam, 2 to 5 percent slopes. This well drained soil is in broad upland areas.

Included with this soil in mapping are small areas of Prentiss soils. Also included are areas where the depth to the C horizon ranges from 30 to 40 inches.

This soil is strongly acid or very strongly acid. Permeability is moderately rapid, and available water capacity is medium. Runoff is slow.

Most areas of this soil have been cleared and are cultivated or used for pasture. Some areas are in woodland. This soil is well suited to cotton, corn, soybeans, pasture plants, pine trees, and hardwood trees. It can be kept in row crops continuously if terraces, contour cultivation, return of crop residue to the soil, and row arrangements are used. Capability unit IIe–2; woodland suitability group 2o7.

Bibb series

The Bibb series consists of poorly drained soils on flood plains. The soils formed in loamy alluvium.

In a representative profile the surface layer is dark gray fine sandy loam about 5 inches thick. The underlying material is gray sandy loam that has yellowish brown and brownish yellow mottles.

Representative profile of Bibb fine sandy loam, frequently flooded, 5 ¾ miles southeast of Stringer School and 300 feet north of road, NW¼SE¼ sec. 3, T. 10 N., R. 12 W.:

A1—0 to 5 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

C1g—5 to 9 inches; gray (10YR 6/1) fine sandy loam; few fine faint yellowish brown mottles; structureless breaking into weak medium subangular blocky peds; friable; few fine roots; strongly acid; clear smooth boundary.

C2g—9 to 30 inches; gray (10YR 6/1) sandy loam; common medium distinct brownish yellow (10YR 6/6) mottles; structureless breaking into weak medium subangular blocky peds; friable; few fine roots; strongly acid; gradual wavy boundary.

C3g—30 to 60 inches; gray (10YR 6/1) sandy loam; many medium distinct yellowish

brown (10YR 5/8) mottles; structureless; friable; few sand pockets and thin strata of sand; strongly acid.

The profile is strongly acid or very strongly acid. The A1 horizon is dark gray, dark grayish brown, or brown.

The C horizon is light gray, gray, or dark gray and has few to many mottles in shades of red, yellow, and brown. It is loam, silt loam, or sandy loam, and has less than 18 percent clay between the depths of 10 and 40 inches.

Bibb soils are associated with Dorovan, Kirkville, and Mantachie soils. They have more gray colors, lack the thick dark-colored A horizon, and are not so high in organic matter content as Dorovan soils. They have more gray colors and are poorer drained than Kirkville and Mantachie soils.

Bb—Bibb fine sandy loam, frequently flooded. This poorly drained soil is on flood plains. Slopes are 0 to 2 percent.

Included with this soil in mapping are small areas of Mantachie and Mathiston soils.

This soil is strongly acid to very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is very slow. During periods of high rainfall, the soil is frequently flooded and has a seasonal high water table at or near the surface.

Most areas of this soil are in woodland. Some small areas are used for pasture. This soil is well suited to hardwood trees and loblolly pine. If proper drainage is provided it is suited to most commonly grown pasture grasses (fig. 1). Capability unit Vw–1; woodland suitability group 2w9.

Boswell series

The Boswell series consists of moderately well drained upland soils that have a firm, clayey subsoil.

In a representative profile the surface layer is dark grayish brown fine sandy loam about 2 inches thick. The subsurface layer is yellowish brown fine sandy loam about 3 inches thick. The upper part of the subsoil is red clay about 13 inches thick; the middle part, to a depth of about 52 inches, is mottled reddish, grayish, and brownish clay; and the lower part, to a depth of 70 inches, is gray clay that has reddish and brownish mottles.

Representative profile of Boswell fine sandy loam, 2 to 5 percent slopes, 0.5 mile northeast of Catholic Monastery and 120 feet north of Highway 18, NW¼NE¼ sec. 29, T. 3 N., R. 12 E.:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many medium and fine roots; strongly acid; abrupt wavy boundary.

A2—2 to 5 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; many medium and fine roots; strongly acid; abrupt wavy boundary.

B21t—5 to 12 inches; red (2.5YR 4/6) clay;

Figure 1.—**Area of Bibb fine sandy loam, frequently flooded. Standing water indicates poor drainage. Pasture benefits from artificial drainage.**

strong fine and medium angular blocky and subangular blocky structure; firm, plastic and sticky; few medium roots; some cracks and root channels filled with brownish material; shiny faces on peds; strongly acid; clear wavy boundary.

B22t—12 to 18 inches; red (2.5YR 4/6) clay; many medium prominent yellowish brown (10YR 5/6) mottles; strong fine and medium angular blocky structure; firm, plastic and sticky; few fine roots; some cracks and root channels filled with brownish material; shiny faces on peds; strongly acid; clear wavy boundary.

B23t—18 to 23 inches; mottled red (10YR 4/6), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/4) clay; strong fine and medium angular blocky structure; firm, very plastic and sticky; few fine roots; some cracks and root channels filled with brownish material; shiny faces on peds; strongly acid; gradual wavy boundary.

B24t—23 to 40 inches; mottled red (10YR 4/6) and light brownish gray (10YR 6/2) clay; strong fine and medium angular blocky structure; firm, very plastic and sticky; few slickensides that do not intersect; shiny faces on peds; strongly acid; gradual wavy boundary.

B25t—40 to 52 inches; mottled light brownish gray (10YR 6/2), red (10YR 4/6), and strong brown (7.5YR 5/6) clay; strong fine and medium angular blocky structure; firm, very plastic and sticky; few slickensides that do not intersect; shiny faces on peds; strongly acid; gradual smooth boundary.

B3tg—52 to 70 inches; gray (10YR 6/1) clay; many medium prominent strong brown (7.5YR 5/6) and red (10YR 4/6) mottles; strong medium angular blocky structure; firm, very plastic and sticky; few slickensides that do not intersect; shiny faces on peds; few shale fragments; strongly acid.

The profile is very strongly acid or strongly acid.

The A1 horizon is dark gray, very dark grayish brown, or dark grayish brown. The Ap and A2 horizons are dark grayish brown, grayish brown, yellowish brown, pale brown, or brown.

The B horizon is silty clay loam, silty clay, or clay and is 35 to 60 percent clay. The upper part of the Bt horizon is yellowish red to red. The lower part of the Bt horizon has matrix colors similar to those of the upper part but has mottles of gray and yellow or is mottled in shades of red, gray, and yellow. Gray mottles occur at a depth between 10 and 30 inches below the top of the Bt horizon.

Boswell soils are associated with Shubuta, Susquehanna, and Sweatman soils. They differ from Shubuta soils by having gray mottles at a depth between 10 and 30 inches below the top of the B horizon. They have no gray mottles in the upper 10 inches of the B horizon, whereas Susquehanna soils have these mottles. They have a clayey B horizon more than 60 inches thick, which is thicker than that in Sweatman soils.

BoB—Boswell fine sandy loam, 2 to 5 percent slopes. This moderately well drained soil is on broad ridgetops. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Shubuta and Sweatman soils.

This soil is strongly acid or very strongly acid. Permeability is very slow, and available water capacity is high. This soil tends to shrink and crack during dry periods. Runoff is slow to medium. Where this soil is cultivated, the hazard of erosion 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 improve the soil. Terracing, grassed waterways, row arrangement, and stripcropping should be used to reduce erosion.

About half of the acreage is in pasture, and some minor areas are in crops. The rest is in pine trees and mixed hardwoods. This soil is suited to cotton, corn, soybeans, small grain, pasture plants, and pine trees. Capability unit IIIe–6; woodland suitability group 3c2.

BoC—Boswell fine sandy loam, 5 to 8 percent slopes. This moderately well drained soil has a firm clayey subsoil and is on ridgetops.

The surface layer is dark grayish brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red clay to a depth of about 18 inches; the middle part, to a depth of about 44 inches, is mottled red, gray, and yellowish brown clay; and the lower part is mottled gray and red clay.

Included with this soil in mapping were small areas of Shubuta and Sweatman soils.

This soil is strongly acid or very strongly acid. Permeability is very slow, and available water capacity is high. This soil tends to shrink and crack during dry periods. Where this soil is cultivated, runoff is medium. This soil is easy to till, except in areas where the subsoil is exposed. Crop residue and soil-improving crops should be used to improve the soil. Terracing, grassed waterways, row arrangement, and stripcropping should be used to reduce erosion.

About half of the acreage is in woodland. Most of the rest is in pasture, but some minor areas are in crops. This soil is better suited to pasture plants and pine trees than to most other uses. Capability unit IVe–4; woodland suitability group 3c2.

Dorovan series

The Dorovan series consists of very poorly drained soils on flood plains. These soils are high in organic matter content. They formed in loamy alluvium.

In a representative profile the surface layer is black muck about 85 inches thick. The underlying material is a gray loamy sand.

Representative profile of Dorovan muck, ½ mile south of Stringer and ⅜ mile west of Highway 15, NW¼NW¼ sec. 12, T. 10 N., R. 13 W.:

Oa1—0 to 5 inches; black (10YR 2/1) muck; about 30 percent fibers, unrubbed, and less than 5 percent fibers, rubbed; massive; very friable; many medium roots;

very strongly acid; gradual wavy boundary.

Oa2—5 to 15 inches; black (2.5Y 2/0) muck that remains black (2.5Y 2/0) when rubbed; about 30 percent fibers, unrubbed, and less than 5 percent, rubbed; massive; very friable; many fine roots; very strongly acid; gradual wavy boundary.

Oa3—15 to 85 inches; black (2.5Y 2/0) muck that remains black (2.5Y 2/0) when rubbed; about 20 percent fibers, unrubbed, and less than 5 percent, rubbed; massive; very friable; many fine roots; very strongly acid; gradual wavy boundary.

IICg—85 to 95 inches; gray (10YR 5/1) loamy sand; structureless; very friable; strongly acid.

The organic layer is very dark gray or black and is more than 51 inches thick. It is strongly acid or very strongly acid. It is 30 to 40 percent fiber when unrubbed; fiber is less than one-sixth of the volume when rubbed.

The C horizon is light brownish gray, dark gray, or gray loamy sand or sand.

Dorovan soils are associated with Bibb soils. They have a surface layer that is higher in organic matter content than Bibb soils.

Do—Dorovan muck. This very poorly drained soil is on flood plains. It is high in organic matter content. Slopes are 0 to 2 percent.

The organic layer is very strongly acid or strongly acid. Permeability is very slow, and available water capacity is very high. Runoff is very slow. The soil has a seasonal high water table at or near the surface and is subject to frequent flooding. Most areas of this soil are in woodland. Some small areas are cleared and used for pasture. This soil is suited to hardwood trees. Capability unit VIIw–1; woodland suitability group 4w9.

Freest series

The Freest series consists of moderately well drained upland soils. The soils formed in loamy and clayey materials.

In a representative profile the surface layer is dark grayish brown fine sandy loam about 2 inches thick. The subsurface layer is brown fine sandy loam about 4 inches thick. The subsoil is yellowish brown loam about 9 inches thick over mottled brownish and grayish clay loam that extends to a depth of 80 inches.

Representative profile of Freest fine sandy loam, 2 to 5 percent slopes, in woodland, 8.5 miles northwest of Montrose and 75 feet southeast, NW¼NW¼ sec. 3, T. 4 N., R. 10 E.:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many medium roots; strongly acid; clear smooth boundary.

A2—2 to 6 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; friable; few fine and medium roots; few medium quartz pebbles; strongly acid; clear wavy boundary.

B21t—6 to 15 inches; yellowish brown (10YR 5/4) loam; few medium faint yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; thin patchy clay films on faces of peds; few fine and medium quartz pebbles; strongly acid; clear wavy boundary.

B22t—15 to 42 inches; mottled pale brown (10YR 6/3), yellowish brown (10YR 5/6) and gray (10YR 6/1) clay loam; strong coarse prismatic structure parting to moderate medium angular blocky; firm, plastic; thin continuous clay films of pale brown on faces of peds; few uncoated sand grains on faces of prisms; few medium quartz pebbles; strongly acid; gradual wavy boundary.

B23t—42 to 52 inches; mottled gray (10YR 6/1), yellowish brown (10YR 5/6), and red (2.5YR 4/6) clay loam; moderate coarse prismatic structure parting to moderate fine and medium angular blocky; very firm, plastic; thin continuous clay films on faces of peds; few slickensides that do not intersect; few quartz pebbles; strongly acid; gradual wavy boundary.

B24t—52 to 80 inches; mottled yellowish brown (10YR 5/6), gray (10YR 6/1), and strong brown (7.5YR 5/6) clay loam; weak coarse prismatic structure parting to weak fine and medium angular blocky; very firm, plastic; thin patchy clay films on faces of peds; few slickensides that do not intersect; few quartz pebbles; common medium and coarse black coatings on faces of peds; slightly acid.

The A1 horizon ranges from dark grayish brown to grayish brown. The Ap or A2 horizon is dark grayish brown, grayish brown, brown, or pale brown.

The upper part of the B horizon is light yellowish brown, yellowish brown, or brownish yellow loam, clay loam, or sandy clay loam. It has few to many mottles in shades of brown, yellow, and gray. The lower part of the B horizon has gray, light brownish gray, or grayish brown ped exterior colors and is clay loam, clay, and silty clay. It is mottled in shades of brown, gray, and red in ped interiors, or the horizon is mottled in shades of brown, gray, or red. The upper 20 inches of the B horizon is 27 to 35 percent clay. The upper part of the subsoil is very strongly acid to medium acid, and the lower part is strongly acid to neutral.

Freest soils are associated with Adaton and Vaiden soils. They are better drained than Adaton soils. They have less clay in the B horizon than Vaiden soils.

FrA—Freest fine sandy loam, 0 to 2 percent slopes. This moderately well drained soil is on broad upland flats.

The surface layer is dark grayish brown fine sandy loam about 2 inches thick over pale brown fine sandy loam about 4 inches thick. The upper part of the subsoil, to a depth of about 24 inches, is mottled yellowish brown, strong brown, and light brownish gray sandy clay loam. The lower part of the subsoil is mottled gray, yellowish brown, and red clay loam.

Included with this soil in mapping were small areas of Adaton and Vaiden soils.

This soil is medium acid to very strongly acid in the upper part of the subsoil and strongly acid to neutral in the lower part of the subsoil. Permeability is slow, and available water capacity is medium. Runoff is slow.

Most areas of this soil are in woodland. Small areas are in pasture and row crops. This soil is suited to cotton, corn, soybeans, and pasture plants. It is well suited to pine trees and hardwood trees. During periods of high rainfall, runoff is the main hazard if this soil is cultivated. Proper row arrangement, open ditches, and diversions are needed in places to remove surface water. Capability unit IIw–4; woodland suitability group 2w8.

FrB—Freest fine sandy loam, 2 to 5 percent slopes. This moderately well drained soil is on broad upland slopes. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Adaton and Vaiden soils.

The soil is medium acid to very strongly acid in the upper part of the subsoil and strongly acid to neutral in the lower part of the subsoil. Permeability is slow, and available water capacity is medium. Runoff is slow to medium. The hazard of erosion is slight.

Most areas of this soil are in woodland. Small areas are used for pasture and row crops. This soil is suited to cotton, corn, soybeans, and pasture plants. It is well suited to pine trees and hardwood trees. Soil erosion is a hazard where this soil is in row crops. Erosion can be controlled by use of grassed waterways, stripcropping, and parallel terraces. Capability unit IIe–3; woodland suitability group 2w8.

FrC—Freest fine sandy loam, 5 to 8 percent slopes. This moderately well drained soil is on uplands. The surface layer is dark grayish brown fine sandy loam about 2 inches thick. The subsurface layer is pale brown fine sandy loam about 8 inches thick. The upper part of the subsoil is light yellowish brown loam about 8 inches thick. The lower part of the subsoil is mottled gray, strong brown, and red clay loam.

Included with this soil in mapping were small areas of Vaiden soils.

This soil is medium acid to very strongly acid in the upper part of the subsoil and strongly acid to neutral in the lower part of the subsoil. Permeability is slow, and available water capacity is medium. Runoff is medium.

Most areas of this soil are in woodland. Small areas have been cleared and are used for pasture and crops. If fertilizers are applied properly, the soil produces moderate yields of cotton, corn, soybeans, and pasture grasses. Soil erosion is a hazard where this soil is used for row crops. Erosion can be controlled by use of grassed waterways, stripcropping, and parallel terraces. This soil is well suited to pine trees and hardwood trees. Capability unit IIIe–3; woodland suitability group 2w8.

Heidel series

The Heidel series consists of well drained soils on uplands. The soils formed in loamy material.

In a representative profile the surface layer is dark grayish brown sandy loam about 4 inches thick. The subsurface layer is brown sandy loam about 7 inches thick. The upper part of the subsoil is yellowish red fine sandy loam about 7 inches thick over red loam to a depth of 46 inches. The lower part of the subsoil, to a depth of 80 inches, is red fine sandy loam.

Representative profile of Heidel sandy loam, 12 to 30 percent slopes, 0.8 mile southeast of Paulding and 100 feet north, in forest, NE¼SW¼ sec. 12, T. 2 N., R. 12 E.:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

A2—4 to 11 inches; brown (10YR 5/3) sandy loam; weak fine granular and subangular blocky structure; very friable; common fine roots; many fine and medium pores; strongly acid; clear smooth boundary.

B1—11 to 18 inches; yellowish red (5YR 4/6) fine sandy loam; weak fine and medium subangular blocky structure; friable; few fine roots; few sand grains coated and bridged with clay and oxides; strongly acid; gradual smooth boundary.

B21t—18 to 36 inches; red (2.5YR 4/6) loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay and oxides; common fine and medium roots; common fine and medium pores; strongly acid; gradual smooth boundary.

B22t—36 to 46 inches; red (2.5YR 4/6) loam; weak medium subangular blocky structure; friable; most sand grains coated and bridged with clay and oxides; common fine pockets of uncoated sand grains; few medium quartz pebbles; few fine and medium roots; common fine and medium pores; strongly acid; gradual smooth boundary.

B23t—46 to 72 inches; red (2.5YR 4/6) fine sandy loam; weak medium subangular blocky structure; friable; most sand grains coated and bridged with clay and oxides; few pockets of uncoated sand grains; few fine and medium roots; few fine pores; strongly acid; gradual smooth boundary.

B24t—72 to 80 inches; red (2.5YR 4/6) fine sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay and oxides; few sand pockets; few fine roots; few fine pores; strongly acid.

The solum ranges from 60 inches to more than 100 inches in thickness. It is strongly acid or very strongly acid.

The A horizon is sandy loam or fine sandy loam. The A1 horizon is very dark grayish brown, dark grayish brown, or dark brown. The Ap and A2 horizons are dark brown, dark grayish brown, grayish brown, brown, pale brown, or yellowish brown.

The Bt horizon is red, reddish brown, or yellowish red fine sandy loam, sandy loam, or loam. It is 10 to 18 percent clay and 20 to 50 percent silt.

Heidel soils are associated with McLaurin and Troup soils. They have no bisequum horizon, whereas McLaurin soils do. They have a thinner A horizon than Troup soils.

HeD—Heidel sandy loam, 8 to 12 percent slopes. This well drained soil is on side slopes.

The surface layer is a dark grayish brown sandy loam about 3 inches thick. The subsurface layer is yellowish brown sandy loam about 7 inches thick. The upper part of the subsoil is yellowish red sandy loam about 50 inches thick, and the lower part, to a depth of about 70 inches, is a red sandy loam.

This soil is strongly acid to very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is rapid. The hazard of erosion is severe.

Most areas of this soil are in pasture and woodland, but a small acreage is in crops. This soil should have a permanent plant cover most of the time. It is suited to pasture plants and pine trees. Erosion is a severe hazard where this soil is in row crops. Where erosion is controlled adequately by using grassed waterways, terraces, and stripcropping, row crops can be grown. Capability unit IVe–2; woodland suitability group 2o1.

HeE—Heidel sandy loam, 12 to 30 percent slopes. This well drained soil is on uplands. It has the profile described as representative of the series.

This soil is strongly acid to very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is rapid. The hazard of erosion is severe.

Most areas of this soil are in woodland. Because of steep slopes and the severe hazard of erosion, this soil is better suited to trees than to most other uses. It is well suited to pine trees. Capability unit VIIe–3; woodland suitability group 2o1.

HTF—Heidel-Troup association, hilly. This association consists mostly of well drained soils on uplands. It is characterized by narrow ridgetops that have steep side slopes. Slopes are 15 to 30 percent. Areas range from 160 to 1,800 acres in size. Areas of this association are generally larger than those of most other mapping units in the county, but mapping has been controlled well enough for the anticipated use of the soils. The pattern and extent of the soils are fairly uniform throughout the association. Each area contains these two soils and one or more less extensive soils.

This association is about 91 percent Heidel and Troup soils. Of this, about 53 percent is Heidel soil and soils similar to Heidel soils and 38 percent is Troup soil. The rest of the association is Lakeland and Lucy soils.

The Heidel soil is mostly on ridgetops and the upper part of side slopes. Areas are long and narrow, generally 100 to 200 feet wide and ¼ mile long or longer. The Heidel soil has a surface layer of dark grayish brown sandy loam about 4 inches thick. The subsurface layer is pale brown sandy loam about 8 inches thick. The upper part of the subsoil is yellowish red sandy loam about 30 inches thick, and the lower part, to a depth of 70 inches, is red sandy loam.

The Heidel soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is rapid. The hazard of erosion is severe.

The Troup soil is mostly on the middle and lower parts of side slopes. Areas are generally parallel to drainageways and are more than 200 feet wide. The Troup soil has a surface layer of very dark grayish brown loamy sand about 4 inches thick. The subsurface layer is pale brown to yellowish brown loamy sand about 52 inches thick. The subsoil, to a depth of 85 inches, is yellowish red sandy clay loam.

The Troup soil is strongly acid or very strongly acid. Permeability is rapid, and available water capacity is low. Runoff is rapid. The hazard of erosion is severe.

Most areas of this association are in pine woodland. The soils are well suited to this use. Heidel soil in capability unit VIIe–3, Troup soil in capability unit VIIs–2; Heidel soil in woodland suitability group 2o1, Troup soil in woodland suitability group 3s2.

Jena series

The Jena series consists of well drained soils on flood plains. The soils formed in loamy alluvium.

In a representative profile the surface layer is dark brown sandy loam about 9 inches thick. The upper part of the subsoil, to a depth of about 32 inches, is yellowish brown sandy loam. The lower part of the subsoil, to a depth of about 70 inches, is yellowish brown sandy loam that has a few light gray mottles.

Representative profile of Jena sandy loam, frequently flooded, 100 feet east of road and ½ mile south of South Side School, NE¼NW¼ sec. 20, T. 1 N., R. 13 E.:

A1—0 to 9 inches; dark brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; common medium roots; few streaks of sand; very strongly acid; clear smooth boundary.

B21—9 to 22 inches; yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; friable; few fine roots; root holes filled with material from the A1 horizon; common small pores; strongly acid; gradual wavy boundary.

B22—22 to 32 inches; yellowish brown (10YR 5/4) sandy loam; few fine faint light yellowish brown mottles; weak medium subangular blocky structure; friable; few fine roots; common small pores; strongly acid; gradual wavy boundary.

B23—32 to 47 inches; yellowish brown (10YR 5/4) sandy loam; few medium distinct very pale brown (10YR 7/3) and light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable; few fine roots; few horizontal bands of loamy sand about 1 inch to 2 inches thick; few small pores; strongly acid; gradual wavy boundary.

B24—47 to 70 inches; yellowish brown (10YR 5/4) sandy loam; few fine distinct light gray mottles; weak medium subangular blocky structure; very friable; few hori-

zontal streaks of sand; very strongly acid.

Reaction is strongly acid or very strongly acid throughout the profile, except where these soils have been limed.

The A1 horizon is a dark grayish brown, brown, or dark brown fine sandy loam or sandy loam.

The upper part of the B horizon is brown or yellowish brown fine sandy loam, sandy loam, or silt loam. Between 10- to 40-inches of depth it is 10 to 18 percent clay. The lower part of the B horizon ranges from sandy loam to fine sandy loam. It is yellowish brown to brown and has light gray mottles.

Jena soils are associated with Kirkville and Mantachie soils. They have no gray mottles within a depth of 24 inches as do Kirkville soils. They are better drained and have less clay in the B horizon than Mantachie soils.

Je—Jena sandy loam, frequently flooded. This well drained soil is on flood plains. Slopes are 0 to 2 percent.

Included with this soil in mapping are small areas of Kirkville and Mantachie soils.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is medium. This soil is subject to frequent flooding.

Most areas of this soil are in woodland. Small areas are in pasture. If proper drainage is provided, this soil is suited to pasture plants. It is well suited to pine trees and hardwood trees. Capability unit Vw–2; woodland suitability group 1o7.

Kirkville series

The Kirkville series consists of moderately well drained soils on flood plains. The soils formed in loamy alluvium.

In a representative profile the surface layer is dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is dark brown fine sandy loam about 7 inches thick. The upper part of the subsoil, to a depth of about 26 inches, is brown fine sandy loam that has grayish and brownish mottles in the lower part. The lower part of the subsoil, to a depth of 50 inches, is mottled gray, brown, and dark yellowish brown fine sandy loam. The underlying material, to a depth of 70 inches, is gray fine sandy loam that has dark yellowish brown mottles.

Representative profile of Kirkville fine sandy loam, in a wooded area of Kirkville-Jena association, frequently flooded, 100 feet south of Etehoma Creek, approximately 4 miles south of Bay Springs, and ½ mile east of Highway 15, SE¼SE¼ sec. 17, T. 1 N., R. 10 E.:

A11—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

A12—3 to 10 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; clear wavy boundary.

B21—10 to 16 inches; dark brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

B22—16 to 26 inches; brown (10YR 5/3) fine sandy loam; many medium distinct light brownish gray (10YR 6/2) and few medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

B23—26 to 50 inches; mottled gray (10YR 6/1), brown (10YR 5/3), and dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few black concretions; very strongly acid; gradual wavy boundary.

Cg—50 to 70 inches; gray (10YR 6/1) fine sandy loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; structureless; very friable; very strongly acid.

The profile is strongly acid or very strongly acid throughout.

The A horizon is dark grayish brown, brown, or dark brown fine sandy loam, sandy loam, or loam.

The upper part of the B horizon is dark brown, brown, or dark yellowish brown fine sandy loam, sandy loam, or loam. Between 10- to 40-inches of depth it is 10 to 18 percent clay. The B horizon has gray mottles at a depth of 20 inches or less. The B23 and C horizons are mottled in shades of brown and gray or are gray to grayish brown and have mottles in shades of brown, yellow, and red.

Kirkville soils are associated with Bibb, Jena, Mantachie, and Mathiston soils. They are better drained than Bibb, Mantachie, and Mathiston soils. They have a coarser texture in the B horizon than Mantachie and Mathiston soils. They are not so well drained as Jena soils.

Kk—Kirkville-Mantachie complex. This complex consists mostly of somewhat poorly drained and moderately well drained soils on flood plains. The flood plains are generally less than ⅛ mile wide. Slopes are 0 to 2 percent. Areas are 20 to 160 acres in size.

This complex is about 93 percent Kirkville and Mantachie soils. Of this, about 54 percent is Kirkville soil and 39 percent is Mantachie soil. The rest of the complex is Bibb and Jena soils.

The Kirkville soil is adjacent to stream channels. It is moderately well drained. The surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is dark yellowish brown loam about 7 inches thick. The lower part is mottled yellowish brown, light brownish gray, and strong brown sandy loam.

The Kirkville soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is slow.

The Mantachie soil is in lower lying areas farther from the stream channels. It is somewhat poorly drained. The surface layer is dark grayish brown loam about 6 inches thick. The subsoil, to a depth of about 20 inches, is yellowish brown loam that has grayish brown mottles. The lower part of the subsoil, to a depth of about 60 inches, is gray loam that has brownish mottles.

The Mantachie soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is slow.

Most areas of this complex are in hardwood trees. These soils are well suited to bottom-land hardwoods and pine trees. Small areas of these soils have been cleared and are used for crops and pasture. If adequately drained, the soils are suited to cotton, corn, soybeans, small grain, and pasture. Capability unit IIw–1; Kirkville soil in woodland suitability group 1w9, Mantachie soil in woodland suitability group 1w8.

KR—Kirkville-Jena association, frequently flooded. This association consists of moderately well drained and well drained soils on flood plains. It is flooded frequently during winter and spring. These flood plains are ⅛ mile to 2 miles wide. Slopes are 0 to 2 percent. Areas range from 160 to 4,500 acres in size. Areas of this association are more variable than those of most other mapping units in the county, but mapping has been controlled well enough for the anticipated use of the soils. The pattern and extent of the soils are fairly uniform throughout the association. Each area contains these two soils and one or more less extensive soils.

This association is about 62 percent Kirkville and Jena soils. Of this, about 40 percent is Kirkville soil and 22 percent is Jena soil. The rest of the association is Bibb, Mantachie, and Mathiston soils.

The Kirkville soil is moderately well drained. It is in areas farther from the streams. A Kirkville soil in an area of this association has the profile described as representative of the series.

The Kirkville soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is slow.

The Jena soil is well drained. It is near the larger streams. The soil has a surface layer of dark grayish brown sandy loam about 4 inches thick. The subsurface layer is dark brown fine sandy loam about 8 inches thick. The upper part of the subsoil is brown loam about 18 inches thick. The lower part of the subsoil is brown sandy loam that has gray mottles. The gray color increases as depth increases.

The Jena soil is strongly acid to very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is medium.

Most areas of this association are in hardwoods. The soils are better suited to bottom-land hardwoods and pine trees. If proper drainage and flood prevention are provided, the soils are suited to pasture plants. Capability unit Vw–2; Kirkville soil in woodland suitability group 1w9, Jena soil in woodland suitability group 1o7.

Lakeland series

The Lakeland series consists of excessively drained soils on uplands. The soils formed in loamy sand to sand.

In a representative profile the surface layer is very dark grayish brown sand about 4 inches thick. The upper part of the underlying material, to a depth of about 23 inches, is yellowish brown to strong brown sand. The lower part, to a depth of 78 inches, is reddish yellow to very pale brown sand.

Representative profile of Lakeland sand, 5 to 12 percent slopes, 1 mile west of Phalti Lakes and 100 feet south of dirt road, NE¼NE¼ sec. 7, T. 2 N., R. 13 E.:

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) sand; single grained; loose; many fine roots; strongly acid; clear smooth boundary.

C1—4 to 12 inches; yellowish brown (10YR 5/4) sand; single grained; loose; few fine roots; strongly acid; gradual smooth boundary.

C2—12 to 23 inches; strong brown (7.5YR 5/6) sand; single grained; loose; streaks of white sand and few uncoated sand grains; strongly acid; gradual smooth boundary.

C3—23 to 42 inches; reddish yellow (7.5YR 6/6) sand; single grained; loose; many clean white uncoated sand grains; strongly acid; gradual smooth boundary.

C4—42 to 78 inches; very pale brown (10YR 7/4) sand; single grained; loose; many clean white uncoated sand grains; strongly acid.

The solum ranges from sand to fine sand that is 5 to 10 percent very fine sand, silt, and clay in the control section. The profile is very strongly acid to medium acid.

The A1 horizon is very dark gray, very dark grayish brown, dark grayish brown, or dark brown.

The upper part of the C horizon is yellowish red, yellowish brown, strong brown, or brownish yellow. The lower part of the C horizon is very pale brown, pale brown, strong brown, yellow, yellowish red, or reddish yellow.

Lakeland soils are associated with McLaurin, Lucy, and Troup soils. They have coarser texture throughout the profile than McLaurin soils. They have a thicker sandy lower layer than Lucy and Troup soils.

LaD—Lakeland sand, 5 to 12 percent slopes. This excessively drained soil is mostly on narrow ridges and side slopes. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Troup and Lucy soils.

This soil is very strongly acid to medium acid. Permeability is very rapid, and available water capacity is low. Runoff is slow.

Most areas of this soil are in woodland or are idle. Natural vegetation consists of blackjack oak and a few areas of pine trees. This soil is suited to pine trees and pasture plants, but plants are difficult to establish because of low available water capacity. Capability unit VIs–1; woodland suitability group 4s3.

LaE—Lakeland sand, 12 to 30 percent slopes. This excessively drained soil is mostly on side slopes.

The surface layer is very dark gray sand about 3 inches thick. The subsurface layer is dark brown sand about 8 inches thick. The upper part of the subsoil is a strong brown sand about 5 inches thick. The next layer, to a depth of about 70 inches, is yellowish red sand.

Included in mapping were small areas of McLaurin and Troup soils.

This soil is very strongly acid to medium acid. Permeability is very rapid, and available water capacity is low. Runoff is slow.

Most areas of this soil are in woodland or are idle. Natural vegetation consists of blackjack oak and a few areas of pine trees. This soil is suited to pine trees, but trees are difficult to establish because of low available water capacity. Capability unit VIIs–1; woodland suitability group 4s3.

Leeper series

The Leeper series consists of somewhat poorly drained soils on flood plains. The soils formed in clayey alluvium.

In a representative profile the surface layer is dark grayish brown silty clay about 5 inches thick. The subsoil, to a depth of 28 inches, is dark grayish brown silty clay that has light olive brown mottles. The underlying material, to a depth of about 55 inches, is mottled gray, dark yellowish brown, and light olive brown silty clay.

Representative profile of Leeper silty clay, 2 miles north of Louin and ¾ mile northwest of road, NW¼NW¼ sec. 15, T. 3 N., R. 10 E.:

Ap—0 to 5 inches; dark grayish brown (2.5Y 4/2) silty clay; moderate medium subangular blocky and weak medium granular structure; firm, plastic; many fine roots; moderately alkaline; abrupt smooth boundary.

B2—5 to 28 inches; dark grayish brown (2.5Y 4/2) silty clay; few fine faint light olive brown mottles; weak medium subangular blocky structure; firm, plastic; few fine roots; pressure faces on ped faces; moderately alkaline; gradual wavy boundary.

C—28 to 55 inches; mottled gray (10YR 5/1), dark yellowish brown (10YR 4/4), and light olive brown (2.5Y 5/4) silty clay; massive; firm, sticky and plastic; pressure faces on ped faces; few small slickensides that do not intersect; few small black concretions; few small lime nodules; moderately alkaline.

The solum ranges from 20 to 50 inches in thickness. It is medium acid to moderately alkaline.

The Ap horizon is dark gray, dark grayish brown, or dark brown.

The B horizon is dark grayish brown or grayish brown and in some profiles has mottles in shades of brown and gray. It is clay or silty clay.

The C horizon is light gray, gray, or light brownish gray or is mottled in shades of brown and gray. It is silty clay, clay loam, or clay.

Leeper soils are associated with Marietta, Una, and Urbo soils. They have finer texture than Marietta soils. They are more alkaline than Una and Urbo soils.

Le—Leeper silty clay. This somewhat poorly drained soil is on flood plains. Slopes are 0 to 2 percent.

Included with this soil in mapping are small areas of Marietta soils.

This soil is medium acid to moderately alkaline. Permeability is very slow, and available water capacity is high. This soil shrinks and cracks during dry periods. Runoff is slow.

Most areas of this soil are in pasture and hay. If adequate drainage is provided, this soil is well suited to the most commonly grown pasture plants. It is subject to occasional flooding, which occurs in winter and early in spring and does not usually damage crops. It is suited to cotton, corn, soybeans, and hardwood trees. Capability unit IIw–5; woodland suitability group 1w6.

Louin series

The Louin series consists of somewhat poorly drained soils on uplands. The soils formed in clayey material.

In a representative profile the surface layer is very dark grayish brown silty clay loam about 2 inches thick. The next layer, to a depth of 7 inches, is yellowish brown silty clay that has grayish and brownish mottles. The next layer, to a depth of about 60 inches, is mottled brownish and grayish clay. The underlying material, to a depth of 90 inches, is yellowish brown clay that has gray mottles.

Representative profile of Louin silty clay loam, in woodland, 1.4 miles northeast of Montrose on Highway 15, 3.6 miles north; 1 mile west to railroad crossing, 0.1 mile northwest of railroad crossing, and 100 feet southwest, SE¼SE¼ sec. 11, T. 4 N., R. 10 E.:

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) silty clay loam; weak fine granular and subangular blocky structure; firm, sticky and plastic; many fine through coarse roots; very strongly acid; clear wavy boundary.

AC1—2 to 7 inches; yellowish brown (10YR 5/6) silty clay; common medium distinct light brownish gray (10YR 6/2) mottles and few medium faint strong brown (7.5YR 5/6) mottles; weak fine angular blocky structure; firm, sticky and plastic; common fine and medium roots; very strongly acid; clear wavy boundary.

AC2—7 to 19 inches; mottled yellowish brown (10YR 5/6), light brownish gray (2.5Y 6/2), and strong brown (7.5YR 5/6) clay; weak fine angular blocky structure; very firm, very sticky and plastic; common fine and medium roots; few pressure faces on peds; strongly acid; gradual wavy boundary.

AC3—19 to 29 inches; mottled light brownish gray (2.5Y 6/2), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) clay; weak fine angular blocky structure; very firm, very sticky and plastic; few fine and medium roots; many intersecting slickensides about 1 inch long; strongly acid; gradual wavy boundary.

AC4—29 to 43 inches; mottled light brownish gray (2.5Y 6/2), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) clay; intersecting slickensides 2- to 4-inch cross section form into wedge-shaped aggregates; very firm, very sticky and plastic; few fine and medium roots; strongly acid; gradual wavy boundary.

AC5—43 to 60 inches; mottled strong brown

(7.5YR 5/6), light brownish gray (2.5Y 6/2), and yellowish brown (10YR 5/6) clay; intersecting slickensides 3- to 5-inch cross section form into wedge-shaped aggregates; very firm, very sticky and plastic; few fine roots; few medium quartz pebbles; strongly acid; gradual wavy boundary.

C—60 to 90 inches; yellowish brown (10YR 5/6) clay; many medium distinct gray (10YR 5/1) mottles; intersecting slickensides 8- to 10-inch cross section form into wedge-shaped aggregates; very firm, very sticky and plastic; few fine roots; many medium black concretions; medium acid.

The A horizon is very dark grayish brown, dark gray, dark grayish brown, brown, yellowish brown, or dark yellowish brown. It is silty clay loam or silty clay. The AC horizon where the soil is on slightly higher areas of the landscape is yellowish brown, brownish yellow, light olive brown, or olive brown and has few to many mottles in shades of brown or gray, or it is mottled in shades of brown and gray. It is gray or light brownish gray where the soil is on slightly depressional areas of the landscape. It is silty clay or clay. Between 10- to 40-inches in depth, it is 40 to 60 percent clay. The A and AC horizons are strongly acid or very strongly acid.

The C horizon is yellowish brown or light olive brown and has few to many mottles in shades of brown and gray, or it is mottled in shades of brown and gray. It is silty clay or clay. It is medium acid to mildly alkaline.

Louin soils are associated with Okolona, Sumter, and Vaiden soils. They are more acid throughout than Okolona and Sumter soils. They have less clay in the control section than Vaiden soils.

Lo—Louin silty clay loam. This somewhat poorly drained soil is on broad upland flats. Slopes are 0 to 2 percent.

Included with this soil in mapping are small areas of Okolona and Vaiden soils.

This soil is strongly acid or very strongly acid in the upper part of the profile and medium acid to mildly alkaline in the lower part. Permeability is very slow, and available water capacity is high. Runoff is slow.

Most areas of this soil are in woodland. This soil is well suited to pine trees. If proper drainage is provided, it is suited to pasture plants. Capability unit IIIw–1; woodland suitability group 3c8.

Lucy series

The Lucy series consists of well drained soils on uplands. The soils formed in loamy material.

In a representative profile the surface layer is very dark grayish brown loamy sand about 5 inches thick. The subsurface layer is yellowish brown to pale brown loamy sand about 22 inches thick. The upper part of the subsoil, to a depth of about 46 inches, is yellowish red sandy clay loam. The lower part, to below a depth of 65 inches, is red sandy clay loam.

In Jasper County, Lucy soils are mapped only in an association with Smithdale soils.

Representative profile of Lucy loamy sand, in a wooded area of Smithdale-Lucy association, hilly, 3 miles east of old Highway 15 at Salem Church, SW¼NE¼ sec. 30, T. 1 N., R. 11 E.:

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; very friable; very strongly acid; abrupt smooth boundary.

A21—5 to 11 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable; very strongly acid; gradual smooth boundary.

A22—11 to 27 inches; pale brown (10YR 6/3) loamy sand; weak fine granular structure; very friable; very strongly acid; gradual smooth boundary.

B21t—27 to 46 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; patchy clay films on ped faces; sand grains coated and bridged with clay; very strongly acid; gradual smooth boundary.

B22t—46 to 65 inches; red (2.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid.

The A horizon ranges from 20 to 40 inches in thickness. The A1 horizon is very dark grayish brown, dark grayish brown, or brown. The A2 horizon is pale brown to yellowish brown.

The B2t horizon is yellowish red to red sandy loam, sandy clay loam, or clay loam. It is 15 to 35 percent clay.

The profile is strongly acid or very strongly acid.

Lucy soils are associated with Lakeland, Smithdale, and Troup soils. They have a loamy B horizon which Lakeland soils lack. They have an A horizon less than 40 inches thick, whereas Troup soils have an A horizon more than 40 inches thick. They have a thicker A horizon than Smithdale soils.

Mantachie series

The Mantachie series consists of somewhat poorly drained soils on flood plains. The soils formed in loamy alluvium.

In a representative profile the surface layer is about 6 inches thick. The upper part is dark grayish brown loam and the lower part is yellowish brown loam. The subsoil, to a depth of 32 inches, is yellowish brown loam that has grayish mottles over about 5 inches of mottled yellowish brown, light brownish gray, and strong brown loam over about 15 inches of gray loam that has brownish mottles. Below this, to a depth of 55 inches, it is gray sandy clay loam that has brownish mottles.

Representative profile of Mantachie loam, in an area of Mantachie-Mathiston association, frequently flooded, 3.8 miles southeast of Lake Como, 475 feet south of road, and 150 feet west of creek, NW¼SE¼ sec. 16, T. 1 N., R. 11 E.:

A11—0 to 2 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure;

friable; many fine roots; strongly acid; abrupt smooth boundary.

A12—2 to 6 inches; yellowish brown (10YR 5/4) loam; weak medium granular structure; friable; many fine roots; gradual wavy boundary.

B21—6 to 12 inches; yellowish brown (10YR 5/4) loam; many medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; few brown stains; strongly acid; gradual wavy boundary.

B22—12 to 17 inches; mottled yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; friable; few gray sandy streaks; strongly acid; gradual wavy boundary.

B23g—17 to 32 inches; gray (10YR 6/1) loam; many medium distinct yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; pockets of uncoated sand grains; very strongly acid; gradual wavy boundary.

B24g—32 to 55 inches; gray (10YR 6/1) sandy clay loam; many medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm, slightly plastic; pockets of uncoated sand grains and seams of sandy material; very strongly acid.

The profile is strongly acid or very strongly acid.

The A horizon is very dark grayish brown, dark grayish brown, brown, or yellowish brown.

The B horizon is loam, sandy clay loam, or clay loam. It is 18 to 32 percent clay and is more than 15 percent sand coarser than very fine sand. The upper part of the B horizon is mottled gray, brown, and yellow, or it has a matrix color of yellowish brown and mottles of gray, brown, and yellow. The lower part of the B horizon is gray and has yellowish brown and strong brown mottles.

Mantachie soils are associated with Bibb, Jena, Kirkville, and Mathiston soils. They are better drained than Bibb soils. They are not so well drained and have more clay in the B horizon than Jena and Kirkville soils. They have more sand than Mathiston soils.

MM—Mantachie-Mathiston association, frequently flooded. This association consists of somewhat poorly drained soils on flood plains. The soils are frequently flooded during winter and spring. The flood plains are ⅛ mile to 1 mile wide. Areas range from 160 to 6,000 acres in size. Slopes are 0 to 2 percent. This association is more variable than most of the other mapping units in the county, but mapping has been controlled well enough for the anticipated use of the soils. The pattern and extent of the soils are fairly uniform throughout the association. Each area contains these two soils and one or more less extensive soils.

This association is about 71 percent Mantachie and Mathiston soils. Of this, about 37 percent is Mantachie soil and about 34 percent is Mathiston soil. The rest of the association is Bibb, Jena, and Kirkville soils.

The Mantachie soil is near the larger streams. A Mantachie soil in an area of this association has the profile described as representative of the series.

The Mantachie soil is strongly acid to very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is slow.

The Mathiston soil is in areas farther from the stream. A Mathiston soil in an area of this association has the profile described as representative of the series.

The Mathiston soil is strongly acid to very strongly acid. Permeability is moderate, and available water capacity is high.

Most areas of this association are in hardwoods. This association is better suited to bottom-land hardwoods and pine trees than to most other uses. If proper drainage is provided, it is suited to some row crops and pasture plants. Capability unit Vw–2; woodland suitability group 1w9.

Marietta series

The Marietta series consists of moderately well drained soils on flood plains. The soils formed in mixed loamy alluvium.

In a representative profile the surface layer is dark grayish brown silt loam about 6 inches thick. The upper part of the subsoil, to a depth of 18 inches, is dark brown loam that has grayish brown mottles. The lower part of the subsoil, to a depth of 46 inches, is mottled light brownish gray and yellowish brown sandy clay loam. The underlying material, to a depth of 65 inches, is gray sandy clay loam that has yellowish brown mottles.

Representative profile of Marietta silt loam, ¾ mile north of Rose Hill and ½ mile west of road, SE¼SE¼ sec. 30, T. 4 N., R. 13 E.:

A1—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; firm, slightly plastic; many fine and medium roots; mildly alkaline; clear smooth boundary.

B21—6 to 18 inches; dark brown (10YR 4/3) loam; common medium distinct grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; firm, plastic; few fine roots; mildly alkaline; gradual wavy boundary.

B22—18 to 46 inches; mottled light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly plastic; neutral; gradual wavy boundary.

C—46 to 65 inches; gray (10YR 6/1) sandy clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; slightly plastic; neutral.

The profile ranges from medium acid to mildly alkaline.

The A1 horizon is dark grayish brown or grayish brown.

The B horizon is silt loam, silty clay loam, loam, or sandy clay loam. At a depth of 10- to 40-inches it

is 18 to 30 percent clay. The B21 horizon is dark brown, brown, or dark yellowish brown and has grayish mottles. The B22 horizon is mottled in shades of gray, yellow, and brown.

The C horizon is gray and has mottles in shades of brown and yellow.

The Marietta soils are associated with Leeper and Urbo soils. They have less clay in the B horizon than Leeper and Urbo soils. They are not so acid as Urbo soils.

Mr—Marietta silt loam. This moderately well drained soil is on flood plains. Slopes are 0 to 2 percent.

Included with this soil in mapping were small areas of Leeper and Urbo soils.

This soil is medium acid to mildly alkaline. Permeability is moderate, and available water capacity is high. Runoff is slow.

Most areas of this soil are in permanent pasture or hardwoods. Small areas are in cultivated crops. This soil is well suited to cotton, corn, soybeans, small grain, pasture, and hardwoods. It is subject to occasional flooding, usually in winter and early in spring. Crops may be damaged by flooding in places; therefore, field drainage ditches and row arrangement are needed to remove excess water (fig. 2). Capability unit IIw–6; woodland suitability group 1w5.

Mathiston series

The Mathiston series consists of somewhat poorly drained soils on flood plains. The soils formed in loamy alluvium.

In a representative profile the surface layer is dark brown silt loam about 9 inches thick. The upper part of the subsoil is mottled dark brown and light brownish gray silt loam about 8 inches thick. The next layer, to a depth of 32 inches, is gray silt loam that has brown mottles. Below this layer is gray silty clay loam that has mottles in shades of brown and red.

Representative profile of Mathiston silt loam, in an area of Mantachie-Mathiston association, frequently flooded, 500 feet southwest of Tallahoma Creek and 150 feet southeast of State Highway 18, NE¼NE¼ sec. 23, T. 2 N., R. 10 E.:

Ap—0 to 9 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

Figure 2.—**Field drainage ditch on Marietta silt loam. Ditch removes excess surface water.**

B21—9 to 17 inches; mottled dark brown (10YR 4/3) and light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; friable; few black concretions; very strongly acid; gradual wavy boundary.

B22g—17 to 32 inches; gray (10YR 6/1) silt loam; many fine and medium distinct brown (7.5YR 5/4) mottles; weak medium subangular blocky structure; friable; few black and brown concretions; very strongly acid; gradual wavy boundary.

B23g—32 to 43 inches; gray (10YR 6/1) silty clay loam; many medium yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure; firm, slightly plastic; very strongly acid; gradual wavy boundary.

B24g—43 to 55 inches; gray (10YR 6/1) silty clay loam; moderate medium prominent yellowish red (5YR 4/8) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; slightly plastic and sticky; very strongly acid.

The profile is very strongly acid or strongly acid.

The Ap horizon is very dark grayish brown, dark grayish brown, brown, or dark brown silt loam.

The B horizon is silt loam, loam, or silty clay loam. At a depth of 10- to 40-inches it is 18 to 30 percent clay. The upper part of the B horizon is brown to yellowish brown and has gray mottles, or it is mottled with shades of brown, gray, and yellow. The lower part of the B horizon is gray and has mottles in shades of gray, yellow, brown, and red. The B horizon generally has few to common black and brown concretions.

Mathiston soils are associated with Kirkville and Mantachie soils. They are poorer drained and have more silt than Kirkville soils. They have drainage similiar to that of Mantachie soils, but they have more silt in the B horizon.

McLaurin series

The McLaurin series consists of well drained soils on uplands. The soils formed in loamy material.

In a representative profile the surface layer is dark brown loamy sand about 3 inches thick. The subsurface layer is yellowish brown loamy sand about 7 inches thick. The upper part of the subsoil is red sandy loam about 28 inches thick. The middle part is yellowish red sandy loam about 9 inches thick. The lower part of the subsoil, about 33 inches thick, is red sandy loam.

Representative profile of McLaurin loamy sand, 2 to 5 percent slopes, ⅛ mile north of Missionary and 100 feet east of State Highway 503, SW¼SE¼ sec. 10, T. 3 N., R. 12 E.:

A1—0 to 3 inches; dark brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

A2—3 to 10 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.

B21t—10 to 19 inches; red (2.5YR 4/6) sandy loam; moderate medium subangular blocky structure; friable; few thin clay films on peds and clay bridging of sand grains; strongly acid; gradual wavy boundary.

B22t—19 to 38 inches; red (2.5YR 4/8) sandy loam; weak medium subangular blocky structure; friable; few thin clay films on peds; bridging and coating of sand grains with clay and oxides; strongly acid; gradual wavy boundary.

B23t&A′2—38 to 47 inches; yellowish red (5YR 4/8) sandy loam; weak medium subangular blocky and granular structure; very friable; slightly compact and brittle in some peds; common fine pockets of uncoated sand grains and some peds bridged and coated with clay and oxides; strongly acid; gradual wavy boundary.

B′24t—47 to 65 inches; red (2.5YR 4/8) sandy loam; weak medium subangular blocky structure; friable; few thin clay films on peds; bridging and coating of sand grains with clay and oxides; strongly acid; gradual wavy boundary.

B′25t—65 to 80 inches; red (2.5YR 5/6) sandy loam; weak medium subangular blocky structure; friable; bridging and coating of sand grains with clay and oxides; strongly acid.

The profile is strongly acid or very strongly acid.

The A1 horizon is dark grayish brown, brown, or dark brown. Where cultivated, the Ap horizon is grayish brown. The A2 horizon is yellowish brown to brown.

The upper part of the Bt horizon is yellowish red to red. It is dominantly sandy loam but ranges to loam. It is 10 to 18 percent clay. The lower part of the B horizon is similar to the upper part of the B horizon in color, but ranges from sandy loam to loamy sand in texture. The A′2 material is essentially stripped of clay, has paler colors than the B material, and makes up about 10 to 25 percent, by volume, of the B23t&A′2 horizon in a sporadic and discontinuous pattern. The B′t horizon is yellowish red to red sandy loam or sandy clay loam and is 10 to 35 percent clay.

McLaurin soils are associated with Heidel, Lakeland, Ruston, and Smithdale soils. They have bisequum horizons, whereas Heidel soils have no bisequum. They have more clay throughout than Lakeland soils. They have less clay in the B horizon than Ruston and Smithdale soils.

MuB—McLaurin loamy sand, 2 to 5 percent slopes. This well drained soil is on broad uplands. Areas range from 10 to 60 acres. This soil has the profile described as representative of the series.

Included in mapping were small areas of Heidel, Lakeland, and Ruston soils.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is medium.

Most areas of this soil are used for row crops and

pasture. Small areas are in pine trees. This soil is well suited to corn, small grain, pasture plants, and pine trees. Soil erosion is a hazard where this soil is in row crops, but erosion can be controlled if terracing, stripcropping, and row arrangement are used. Capability unit IIe–2; woodland suitability group 3o1.

MuC—McLaurin loamy sand, 5 to 8 percent slopes. This well drained soil is on narrow ridges and side slopes. Areas range from 10 to 80 acres in size.

The surface layer is brown loamy sand about 3 inches thick. The subsurface layer is pale brown or light brown sandy loam about 7 inches thick. The upper part of the subsoil is yellowish red loam about 7 inches thick. Below this, to a depth of 59 inches, is yellowish red sandy loam. The lower part of the subsoil, to a depth of 70 inches, is yellowish red sandy clay loam.

Included in mapping were small areas of Heidel, Lakeland, and Ruston soils. Also included were small areas of soils that have a surface layer of sandy loam.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is medium.

Much of this soil has been cleared and is used for row crops and pasture. Some areas are in pine trees. This soil is well suited to corn, soybeans, small grain, pasture plants, and pine trees (fig. 3). Soil erosion is a hazard where this soil is used for row crops, but erosion can be controlled if terraces, grassed waterways, stripcropping, and row arrangement are used. Capability unit IIIe–2; woodland suitability group 3o1.

Okolona series

The Okolona series consists of well drained soils on uplands. The soils formed in clayey material.

In a representative profile the surface layer is very dark grayish brown clay about 16 inches thick. The next layer, to a depth of about 55 inches, is light olive brown or mottled light brownish gray and light olive brown silty clay. The underlying material is olive marly clay that has strong brown mottles.

Representative profile of Okolona clay, 1 to 3 percent slopes, eroded, 1½ miles northwest of Montrose, 1½ miles north, and ⅛ mile west of road in pasture, NE¼NE¼ sec. 25, T. 4 N., R. 10 E.:

Ap—0 to 6 inches; very dark grayish brown (2.5Y 3/2) clay; weak fine subangular blocky and granular structure; firm, very plastic; many fine roots; common worm castings; few crawfish burrows; few lime nodules; calcareous; moderately alkaline; clear wavy boundary.

A1—6 to 16 inches; very dark grayish brown (2.5Y 3/2) clay; moderate coarse prismatic structure parting to moderate medium angular and subangular blocky; very plastic; common fine roots; common fine and medium lime nodules; calcareous; moderately alkaline; clear wavy boundary.

AC1—16 to 23 inches; light olive brown (2.5Y 5/6) silty clay; intersecting slickensides

Figure 3.—**Bahiagrass pasture on McLaurin loamy sand, 5 to 8 percent slopes.**

parting to wedge-shaped fragments; very firm, very plastic; few fine roots; some mixing of material from above horizons; common dark grayish brown worm castings; common crawfish burrows; common fine and medium lime nodules; calcareous; moderately alkaline; gradual wavy boundary.

AC2—23 to 34 inches; mottled light brownish gray (2.5Y 6/2) and light olive brown (2.5Y 5/6) silty clay; intersecting slickensides parting to wedge-shaped fragments; shiny ped faces; very firm; very plastic; few fine roots; some mixing of material from above horizons; common dark grayish brown worm castings; common crawfish burrows; common fine and medium lime nodules; calcareous; moderately alkaline; gradual wavy boundary.

AC3—34 to 55 inches; mottled light olive brown (2.5Y 5/6) and light gray (5Y 7/2) silty clay; intersecting slickensides parting to wedge-shaped fragments; shiny ped faces; very firm, very plastic; few fine roots; some mixing of material from above horizons; common dark grayish brown worm castings; common fine and medium lime nodules; calcareous; moderately alkaline; gradual wavy boundary.

C1—55 to 65 inches; olive (5Y 5/3) marly clay; few coarse prominent strong brown (7.5YR 5/6) mottles; intersecting slickensides parting to wedge-shaped fragments; very firm, very plastic; few fine roots; few black coats on fragments; many lime nodules; calcareous; moderately alkaline; gradual wavy boundary.

C2–65 to 105 inches; olive (5Y 5/3) marly clay; few coarse prominent strong brown (7.5YR 5/6) mottles; intersecting slickensides parting to wedge-shaped fragments; very firm, very plastic; few black coats on fragments; many lime nodules; calcareous; moderately alkaline.

The A horizon is very dark grayish brown, dark grayish brown, or dark brown. The waviness of the boundary between the A and AC horizons ranges from about 9 to 20 inches. The AC and C horizons are light olive brown, olive brown, olive, or olive gray or are mottled in shades of olive, brown, and gray. The AC and C horizons are silty clay or clay. They are 40 to 55 percent clay between the depths of 10 and 40 inches. The soil is neutral to moderately alkaline.

Okolona soils are associated with Louin, Sumter, and Vaiden soils. They are more alkaline throughout than Louin and Vaiden soils. They have intersecting slickensides and are deeper to chalk than Sumter soils.

OkB2—Okolona clay, 1 to 3 percent slopes, eroded. This well drained soil is on broad uplands.

This soil is neutral or moderately alkaline. Permeability is very slow, and available water capacity is high. Runoff is slow. This soil shrinks and cracks during dry periods. This soil has been eroded in many areas, and the surface layer is a mixture of material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

Most areas of this soil are used for pasture. Some small areas are used for row crops. This soil is suited to cotton, corn, small grain, and pasture. It can be continuously used for row crops if good conservation practices are applied. Stands may be difficult to establish because of the fine texture of the surface layer. Soil erosion is a hazard where the soil is in crops, but it can be controlled if row arrangement, parallel terraces, grassed waterways, and stripcropping are used. Small areas of woodland are mostly eastern redcedar. Capability unit IIe–6; woodland suitability group 4c2c.

Ora series

The Ora series consists of moderately well drained soils on uplands. The soils formed in loamy material. They have a fragipan.

In a representative profile the surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red clay loam about 14 inches thick over yellowish red loam about 9 inches thick. The lower part of the subsoil is a fragipan that is firm, hard, compact, and brittle. To a depth of 40 inches, it is yellowish red loam that has brownish and grayish mottles. Below this layer, to a depth of 70 inches, it is loam that has mottles in shades of gray, red, and brown.

Representative profile of Ora fine sandy loam, 2 to 5 percent slopes, eroded, 2¾ miles southeast of Bay Springs and 300 yards north of State Highway 528, SW¼SE¼ sec. 35, T. 2 N., R. 10 E.:

Ap—0 to 5 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

B21t—5 to 19 inches; red (2.5YR 4/6) clay loam; moderate medium subangular blocky structure; friable; few fine roots; many clay films on vertical and horizontal faces of peds; strongly acid; gradual wavy boundary.

B22t—19 to 28 inches; yellowish red (5YR 4/8) loam; moderate medium subangular blocky structure; friable; few fine roots; patchy clay films on vertical and horizontal faces of peds; very strongly acid; gradual wavy boundary.

Bx1—28 to 40 inches; yellowish red (5YR 4/8) loam; many medium distinct brown (7.5YR 5/4), light brownish gray (10YR 6/2), and light yellowish brown (10YR 6/4) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, hard, compact and brittle; few fine voids; continuous clay films on faces of peds; clay accumulation in cracks and between peds; narrow seams of pale brown (10YR 6/3) loamy sand extend downward between prisms; very strongly acid; gradual wavy boundary.

Bx2—40 to 55 inches; mottled yellowish red (5YR 4/6), light brownish gray (10YR 6/2),

and light yellowish brown (10YR 6/4) loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, hard, compact and brittle; few voids; patchy clay films on faces of peds; narrow seams of light brownish gray (10YR 6/2) loamy sand extend downward between large prisms; very strongly acid; gradual wavy boundary.

Bx3—55 to 70 inches; mottled red (2.5YR 4/6), strong brown (7.5YR 5/6), and light gray (10YR 7/2) loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm, hard, compact and brittle; few voids; wide seams of gray loamy sand extend between prisms; very strongly acid.

The A1 horizon is very dark grayish brown, dark grayish brown, or light yellowish brown. The Ap and A2 horizons are pale brown, yellowish brown, or brown.

The Bt horizon is red or yellowish red loam, clay loam, or sandy clay loam and is 18 to 33 percent clay.

The fragipan is mottled yellow, red, brown, and gray, or it has yellowish red to yellowish brown matrix colors and is mottled in shades of gray and red. It is sandy loam, loam, or sandy clay loam. It is strongly acid or very strongly acid.

Ora soils are associated with Ruston and Savannah soils. They have a fragipan, whereas Ruston soils have no fragipan. They have more red colors in the B horizon than Savannah soils.

OrB2—Ora fine sandy loam, 2 to 5 percent slopes, eroded. This moderately well drained soil has a fragipan. It is on broad ridgetops. This soil has the profile described as representative of the series.

Included with this soil in mapping were small areas of Ruston and Savannah soils.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the soil and moderately slow in the fragipan. Available water capacity is medium. Runoff is medium. The hazard of erosion is slight to moderate. This soil has been eroded in many areas and the surface layer is a mixture of material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

Much of the acreage of this soil is used for row crops and pasture. Many areas are in pine trees. This soil is well suited to cotton, corn, soybeans, small grain, pasture plants, adapted hardwoods, and pine trees. Soil erosion is a hazard where this soil is in row crops. Erosion can be controlled by grassed waterways, terraces, stripcropping, and conservation cropping. Capability unit IIe–5; woodland suitability group 2o7.

OrC2—Ora fine sandy loam, 5 to 8 percent slopes, eroded. This moderately well drained soil has a fragipan. It is on narrow ridges and side slopes.

The surface layer is brown fine sandy loam about 4 inches thick. The upper part of the subsoil is yellowish red sandy clay loam about 21 inches thick. The lower part of the subsoil is a firm, compact, brittle fragipan. To a depth of 44 inches, it is a strong brown loam that has grayish and yellowish mottles. Below this layer, to a depth below 65 inches, it is sandy loam that has mottles in shades of gray, red, and brown.

Included with this soil in mapping were small areas of Ruston and Savannah soils.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the profile and moderately slow in the fragipan. Available water capacity is medium. Runoff is medium. The hazard of erosion is moderate.

This soil has been eroded and in many areas the surface layer is a mixture of material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

Much of the acreage of this soil is used for row crops and pasture, and many areas are in pine trees. This soil is well suited to cotton, corn, soybeans, small grain, adapted hardwoods, and pine trees. Soil erosion is a hazard. Where this soil is in row crops, erosion can be controlled by grassed waterways, terraces, stripcropping, conservation cropping, and crop residue management (fig. 4). Capability unit IIIe–5; woodland suitability group 2o7.

OrD2—Ora fine sandy loam, 8 to 12 percent slopes, eroded. This moderately well drained soil has a fragipan. It is on side slopes.

The surface layer is brown fine sandy loam about 3 inches thick. The upper part of the subsoil is yellowish red loam about 25 inches thick. The lower part of the subsoil is a compact brittle fragipan. Between the depth of 28 and 44 inches it is yellowish brown friable sandy loam that has reddish and grayish mottles. Below this, to a depth of 70 inches, it is sandy loam that is mottled in shades of red, gray, and brown.

Included with this soil in mapping were small areas of Ruston soils.

The soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the profile and moderately slow in the fragipan. Available water capacity is medium. Runoff is rapid. This soil has been eroded, and in many areas the surface layer is a mixture of material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

About half of the acreage of this soil is in mixed hardwoods and pine trees, and most of the remainder is in pasture. This soil is well suited to pine trees and adapted hardwoods. Soil erosion is a hazard to row crops. To help prevent erosion this soil should be in permanent cover most of the time, and if this soil is cultivated, stripcropping, grassed waterways, terracing, and conservation cropping should be used. Capability unit IVe–3; woodland suitability group 2o7.

Prentiss series

The Prentiss series consists of moderately well drained soils on uplands. The soils formed in loamy material. They have a fragipan.

In a representative profile the surface layer is dark gray fine sandy loam about 3 inches thick. The subsurface layer is grayish brown fine sandy loam about 3 inches thick. The upper part of the subsoil is light yellowish brown fine sandy loam about 6 inches thick over yellowish brown loam about 13 inches thick. The lower part of the subsoil is a fragipan that is firm, compact and brittle. To a depth of 30 inches, it is light yellowish brown fine sandy loam that has light brown-

Figure 4.—**Stripcropping on Ora fine sandy loam, 5 to 8 percent slopes, eroded. Strips of corn alternate with bahiagrass.**

ish gray mottles. Below this, to a depth of 46 inches, it is mottled brown, and gray, fine sandy loam. Between the depths of 46 and 60 inches, it is mottled brown, gray, and red loam.

Representative profile of Prentiss fine sandy loam, 0 to 2 percent slopes, 0.8 mile east of Stockman's Store, 0.2 mile north of Highway 528, and 100 feet west of dirt road, SE¼SW¼ sec. 35, T. 2 N., R. 11 E.:

A1—0 to 3 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

A2—3 to 6 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure; very friable; some mixing of material from A1 horizon; many fine roots; strongly acid; clear smooth boundary.

B1—6 to 12 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual smooth boundary.

B21—12 to 20 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; strongly acid; gradual smooth boundary.

B22—20 to 25 inches; yellowish brown (10YR 5/6) loam; few fine faint light yellowish brown mottles; moderate medium subangular blocky structure; friable; few sand grains coated and bridged with clay; few fine and medium brown concretions; few fine roots; strongly acid; gradual wavy boundary.

Bx1—25 to 30 inches; light yellowish brown (10YR 6/4) fine sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm, compact and brittle; polygonal cracks filled with gray loamy sand; common fine pores; very strongly acid; gradual wavy boundary.

Bx2—30 to 38 inches; mottled pale brown (10YR 6/3), gray (10YR 6/1), and yellowish brown (10YR 5/6) fine sandy loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm, compact and brittle; polygonal cracks

filled with gray loamy sand; many fine pores; very strongly acid; gradual wavy boundary.

Bx3—38 to 46 inches; mottled light gray (10YR 7/1) and yellowish brown (10YR 5/8) fine sandy loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm, compact and hard; many fine pores; polygonal cracks filled with gray loamy sand; very strongly acid; gradual wavy boundary.

Bx4—46 to 60 inches; mottled yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), red (2.5YR 4/6), and yellowish red (5YR 5/6) loam; weak medium subangular blocky structure; firm, compact and brittle; very strongly acid.

The A horizon is dark gray, grayish brown, dark grayish brown, or brown.

The B horizon is pale brown, light yellowish brown, or yellowish brown fine sandy loam, sandy loam, or loam. The upper part of the B horizon is 12 to 18 percent clay. The Bx horizon is light yellowish brown and has gray and red mottles; or it is mottled gray, yellow, red, and brown.

The fragipan begins at a depth between 20 and 32 inches. It is fine sandy loam to loam. It is strongly acid or very strongly acid.

Prentiss soils are associated with Bassfield, Savannah, and Stough soils. They have a fragipan, which Bassfield soils lack, and are not so well drained as Bassfield soils. They have less clay in the B horizon than Savannah soils. They are better drained than Stough soils.

PrA—Prentiss fine sandy loam, 0 to 2 percent slopes. This moderately well drained soil is in broad areas. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Bassfield, Savannah, and Stough soils.

The soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the profile and moderately slow in the fragipan. Available water capacity is medium. Runoff is medium.

Much of this soil is cultivated, and the rest is in pasture and woodland. This soil is well suited to cotton, corn, soybeans, pasture plants, adapted hardwoods, and pine trees. This soil can be continuously in row crops if row arrangement, crop residue management, and conservation cropping are used. This soil is easy to till and can be cultivated over a wide range of moisture content without crusting or packing. Capability unit IIw–2; woodland suitability group 2o7.

PrB—Prentiss fine sandy loam, 2 to 5 percent slopes. This moderately well drained soil is in broad areas.

The surface layer is a dark grayish brown fine sandy loam about 8 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam about 22 inches thick. The lower part of the subsoil, to a depth below 65 inches, is a hard, compact, brittle fragipan. The fragipan is mottled gray, brown, and yellow fine sandy loam.

Included with this soil in mapping were small areas of Bassfield, Savannah, and Stough soils.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. Available water capacity is medium. Runoff is medium.

Most of the acreage of this soil is in row crops or pasture. The rest is in mixed pine trees and hardwoods. The soil is well suited to cotton, corn, soybeans, small grain, adapted hardwoods, and pine trees. This soil can be continuously in row crops if parallel terraces, grassed waterways, conservation cropping, and crop residue management are used. Capability unit IIe–5; woodland suitability group 2o7.

Ruston series

The Ruston series consists of well drained soils on uplands. The soils formed in loamy materials.

In a representative profile the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown fine sandy loam about 7 inches thick. The upper part of the subsoil is yellowish red loam about 14 inches thick. Below this is yellowish red fine sandy loam about 6 inches thick. The next layer, to a depth of 43 inches, is yellowish red fine sandy loam that has light yellowish brown mottles. Below this, to a depth of 70 inches, is yellowish red sandy clay loam. The next layer, to a depth of 90 inches, is yellowish red loam.

Representative profile of Ruston fine sandy loam, 2 to 5 percent slopes, 2½ miles east of Salem Baptist Church and 50 feet west from west side of road, NW¼NW¼ sec. 30, T. 1 N., R. 11 E.:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.

A2—5 to 12 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.

B21t—12 to 26 inches; yellowish red (5YR 4/6) loam; moderate medium subangular blocky structure; friable; few fine roots; many clay films on peds; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

B22t—26 to 32 inches; yellowish red (5YR 4/8) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; clay films on ped faces; strongly acid; gradual wavy boundary.

B23t&A'2—32 to 43 inches; yellowish red (5YR 5/6) fine sandy loam; common medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable, slightly compact and brittle in places; common medium yellowish brown bodies of uncoated sand grains; strongly acid; gradual wavy boundary.

B'21t–43 to 70 inches; yellowish red (5YR 4/8) sandy clay loam; weak medium subangular blocky structure; friable; patchy clay films on ped faces; strongly acid; gradual wavy boundary.

B'22t—70 to 90 inches; yellowish red (5YR 5/8) loam; weak medium subangular blocky structure; friable; bridging and coating of sand grains with clay; strongly acid.

The A horizon is dark brown, dark grayish brown, grayish brown, yellowish brown, or light yellowish brown.

The upper part of the Bt horizon is yellowish red to red. The B horizon is typically sandy clay loam or loam, but in places it ranges from fine sandy loam to clay loam. The upper 20 inches of the B horizon is 18 to 30 percent clay. The A'2 material is pale brown to light yellowish brown sandy loam or fine sandy loam that is in streaks and pockets and makes up as much as 50 percent of the B23t&A'2 horizon. The B'2t horizon is yellowish red to red sandy loam, loam, or sandy clay loam. Reaction is medium acid to very strongly acid.

Ruston soils are associated with McLaurin, Ora, and Smithdale soils. They have more clay in the B horizon than McLaurin soils. They have no fragipan, whereas Ora soils have a fragipan. They have bisequum horizons, and Smithdale soils have no bisequum.

RuB—Ruston fine sandy loam, 2 to 5 percent slopes. This well drained soil is on ridgetops. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of McLaurin, Ora, and Smithdale soils.

This soil is medium acid to very strongly acid. Permeability is moderate, and available water capacity is high. Runoff is medium. The hazard of erosion is slight to moderate.

Most areas of this soil are used for row crops and pasture. Small areas are in pine trees. This soil is well suited to cotton, corn, soybeans, small grain, pasture plants, and pine trees (fig. 5). Soil erosion is a hazard, but the soil can be continuously in row crops if crop residue management, conservation cropping, parallel terraces, grassed waterways, and stripcropping are used. Capability unit IIe–1; woodland suitability group 2o1.

RuC—Ruston fine sandy loam, 5 to 8 percent slopes. This well drained soil is on ridgetops.

The surface layer is yellowish brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red sandy clay loam about 31 inches thick over about 10 inches of red sandy loam that has pale brown mottles. The lower part of the subsoil, to a depth of 75 inches, is red sandy loam to sandy clay loam.

Included in mapping were small areas of McLaurin, Ora, and Smithdale soils.

This soil is medium acid to very strongly acid. Permeability is moderate, and available water capacity is high. Runoff is medium. The hazard of erosion is moderate.

Much of the acreage of this soil is in row crops or pasture, and many areas are in pine trees. The soil is suited to cotton, corn, soybeans, and small grain. It is well suited to pasture plants and pine trees. Soil erosion is a hazard to crops; therefore, if the soil is in row crops, parallel terraces, grassed waterways, stripcropping, crop residue management, and conservation cropping should be used. Capability unit IIIe–1; woodland suitability group 2o1.

Savannah series

The Savannah series consists of moderately well drained soils on uplands. The soils formed in loamy materials. They have a fragipan.

In a representative profile the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The upper part of the subsoil is yellowish brown loam about 24 inches thick. The lower part of the subsoil is a fragipan that is firm, compact, and brittle. To a depth of about 50 inches, it is loam that is mottled yellow, brown, and gray. Below this, to a depth of 65 inches, it is clay loam that is mottled brown and gray.

Representative profile of Savannah fine sandy loam, 2 to 5 percent slopes, ½ mile north of Jasper-Jones County line and 100 feet west of Highway 15, SE¼SW¼ sec. 21, T. 10 N., R. 12 W.:

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

B21t—6 to 20 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; patchy clay films on ped faces; strongly acid; clear smooth boundary.

B22t—20 to 30 inches; yellowish brown (10YR 5/6) loam; few fine faint pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; patchy clay films on ped faces; strongly acid; clear smooth boundary.

Bx1—30 to 42 inches; mottled pale brown (10YR 6/3), light gray (10YR 7/1), yellowish brown (10YR 5/8), and strong brown (7.5YR 5/6) loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle, slightly plastic; sand grains coated and bridged with clay; patchy clay films on ped faces; few tongues of gray (10YR 6/1) clay loam extending downward; strongly acid; gradual smooth boundary.

Bx2—42 to 50 inches; mottled brownish yellow (10YR 6/6), light gray (10YR 7/1), and strong brown (7.5YR 5/6) loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle; common fine voids; seams of gray sandy loam between prisms; strongly acid; gradual wavy boundary.

Bx3—50 to 65 inches; mottled light gray (10YR 7/1) and yellowish brown (10YR 5/8) clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, slightly plastic, compact and brittle; continuous clay

Figure 5.—Soybeans on Ruston fine sandy loam, 2 to 5 percent slopes.

films on ped faces; few tongues of gray (10YR 6/1) sandy loam extending downward; strongly acid.

The profile is strongly acid or very strongly acid, except where these soils are limed.

The A1 horizon is very dark gray or very dark grayish brown. The Ap and A2 horizons are dark grayish brown, brown, pale brown, or yellowish brown.

The B horizon is strong brown or yellowish brown sandy clay loam, clay loam, or loam. The Bt horizon is 18 to 32 percent clay.

The fragipan is mottled in shades of yellow, gray, brown, and red. It is loam, sandy clay loam, or clay loam. It begins between the depths of 16 and 38 inches.

Savannah soils are associated with Ora, Prentiss, and Stough soils. They are not so red in the B horizon as Ora soils. They are better drained than Stough soils and have more clay in the B horizon than Stough and Prentiss soils.

SaA—Savannah fine sandy loam, 0 to 2 percent slopes. This moderately well drained soil is in broad areas.

Included with this soil in mapping were small areas of Ora, Prentiss, and Stough soils.

The surface layer is a dark grayish brown fine sandy loam about 7 inches thick. The upper part of the subsoil, to a depth of about 25 inches, is yellowish brown loam that has brownish mottles in the lower 7 inches. The next layer, to a depth of 31 inches, is yellowish brown compact, brittle loam that has gray and strong brown mottles. It is underlain, to a depth of 39 inches, by compact, brittle loam that is mottled in shades of gray, red, brown, and yellow. Below this, to a depth of below 60 inches, is compact brittle clay loam that is mottled in shades of gray, yellow, and brown.

The soil is strongly acid to very strongly acid. Permeability is moderate in the upper part of the soil and moderately slow in the fragipan. Available water capacity is medium. Runoff is slow. The hazard of erosion is slight.

Most areas of this soil are in row crops and pasture. Small areas are in mixed hardwoods and pine trees. The soil is well suited to cotton, corn, soybeans, small grain, pasture plants, hardwoods, and pine trees. The soil can be continuously in row crops if crop residue management and conservation cropping are used. Proper row arrangement, open ditches, and diversions are needed in places to remove surface water. Capability unit IIw–2; woodland suitability group 2o7.

SaB—Savannah fine sandy loam, 2 to 5 percent slopes. This moderately well drained soil is in broad upland areas. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Ora, Prentiss, and Stough soils.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the soil and moderately slow in the fragipan. Available water capacity is medium. Runoff is medium. The hazard of erosion is slight to moderate.

Most areas of this soil are in row crops and pasture, and some areas are in mixed hardwood and pine trees. This soil is well suited to cotton, corn, soybeans, small grain, pasture plants, adapted hardwoods, and pine trees. This soil can be continuously in row crops if crop residue management and conservation cropping are used. Where soil erosion is a hazard, it can be controlled by use of grassed waterways, stripcropping, and terraces. Capability unit IIe–5; woodland suitability group 2o7.

SaC—Savannah fine sandy loam, 5 to 8 percent slopes. This moderately well drained soil is on ridgetops and side slopes.

The surface layer is a dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is pale brown fine sandy loam about 8 inches thick. The subsoil, to a depth of more than 60 inches, is yellowish brown loam about 12 inches thick over compact, brittle loam that is mottled in shades of gray, red, brown, and yellow.

Included with this soil in mapping were small areas of Ora and Prentiss soils.

The soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the soil and moderately slow in the fragipan. Available water capacity is medium. Runoff is medium. The hazard of erosion is moderate.

Much of the acreage of this soil is in pine trees, and the rest is in row crops and pasture. This soil is suited to cotton, corn, soybeans, and small grain. It is well suited to adapted hardwoods and pine trees. Where this soil is in row crops, erosion can be controlled if grassed waterways, terraces, and stripcropping are used. Capability unit IIIe–5; woodland suitability group 2o7.

Shubuta series

The Shubuta series consists of well drained soils on uplands. These soils have a clayey subsoil. They formed in clayey material.

In a representative profile the surface layer is dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is yellowish red clay loam about 10 inches thick. The next layer, to a depth of 33 inches, is red clay. The lower part of the subsoil, to a depth of 70 inches, is mottled red, brown, and gray clay loam or clay.

Representative profile of Shubuta fine sandy loam, 5 to 8 percent slopes, ⅛ mile north of Highway 18 and 2½ miles northeast of Bay Springs, SW¼NW¼ sec. 23, T. 2 N., R. 10 E.:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many fine roots; medium acid; abrupt smooth boundary.

A2—3 to 8 inches; dark brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; friable; few fine roots; medium acid; clear wavy boundary.

B21t—8 to 18 inches; yellowish red (5YR 4/8) clay loam; moderate medium subangular blocky structure; firm; few fine roots; patchy thin clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

B22t—18 to 33 inches; red (2.5YR 4/6) clay; few fine distinct strong brown mottles in lower part; moderate medium subangular blocky structure; firm; few fine roots; continuous thin clay films on faces of peds; strongly acid; gradual wavy boundary.

B23t—33 to 42 inches; mottled red (2.5YR 4/6) and strong brown (7.5YR 5/6) clay; moderate medium subangular blocky structure; firm; few fine roots; continuous thin clay films on faces of peds; strongly acid; gradual wavy boundary.

B24t—42 to 52 inches; mottled red (2.5YR 4/6), gray (10YR 6/1), and strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky and angular blocky structure; firm; few fine roots; few pockets of sandy loam; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B25t—52 to 70 inches; mottled gray (10YR 6/1) and red (2.5YR 4/8) clay; moderate coarse subangular blocky and angular blocky structure; firm; few pockets of uncoated sand; thin patchy clay films on

faces of peds; few thin shale fragments; very strongly acid.

The A1 horizon is very dark grayish brown or dark grayish brown. The Ap and A2 horizons are dark grayish brown, grayish brown, dark brown, brown, light yellowish brown, or yellowish brown.

The upper part of Bt horizon is yellowish red or red. The lower part of the Bt horizon is yellowish red or red and has grayish and brownish mottles, or it is mottled in shades of red, yellow, and gray. The Bt horizon is sandy clay loam, clay loam, sandy clay, or clay. The upper 20 inches of this horizon is 35 to 55 percent clay.

The profile is strongly acid or very strongly acid, except in the surface layer where limed.

Shubuta soils are associated with Boswell and Sweatman soils. They have no gray mottles in the upper 20 inches of the Bt horizon as do Boswell soils. They have a solum that is more than 60 inches thick, whereas Sweatman soils have a thinner and more clayey solum.

SbB2—Shubuta fine sandy loam, 2 to 5 percent slopes, eroded. This well drained soil is on broad upland flats.

The surface layer is dark grayish brown fine sandy loam about 2 inches thick. The subsurface layer is brown fine sandy loam about 2 inches thick. The upper part of the subsoil, to a depth of 15 inches, is red clay. The next layer, to a depth of about 32 inches, is red clay that has yellowish brown mottles. Below this layer, to a depth of more than 65 inches, is clay that is mottled in shades of red, gray, and brown.

Included with this soil in mapping were small areas of Boswell and Sweatman soils.

The soil is strongly acid or very strongly acid, except where limed. Permeability is moderately slow, and available water capacity is high. Runoff is medium. The hazard of erosion is moderate. The soil has been eroded and in many areas the surface layer is a mixture of the material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

Much of the acreage of this soil is used for row crops and pasture, and the rest is in pine trees. The soil is well suited to cotton, corn, soybeans, small grain, pasture plants, and pine trees. Soil erosion is a hazard in areas of row crops. This soil can be continuously in row crops if terracing, grassed waterways, stripcropping, and crop residue management are used. Capability unit IIe–4; woodland suitability group 3c2.

SbC—Shubuta fine sandy loam, 5 to 8 percent slopes. This well drained soil is on ridges and side slopes. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Boswell and Sweatman soils.

This soil is strongly acid or very strongly acid, except where the surface layer has been limed. Permeability is moderately slow, and available water capacity is high. Runoff is medium. The hazard of erosion is moderate.

Much of the acreage of this soil is in pine trees, and the rest is in crops and pasture. This soil is suited to cotton, corn, soybeans, small grain, and pasture plants. It is well suited to pine trees. Where soil erosion is a hazard, it can be controlled by terracing, grassed waterways, stripcropping, conservation cropping, and crop residue management. Capability unit IIIe–4; woodland suitability group 3c2.

Smithdale series

The Smithdale series consists of well drained soils on uplands. The soils formed in loamy material.

In a representative profile the surface layer and the subsurface layer are dark brown fine sandy loam about 10 inches thick. The upper part of the subsoil is red sandy clay loam about 25 inches thick. The lower part of the subsoil, to a depth of about 80 inches, is red sandy loam.

Representative profile of Smithdale fine sandy loam, 15 to 25 percent slopes, 4 miles south of Stockman's store and 200 feet east of road, NW¼NW¼ sec. 26, T. 1 N., R. 11 E.:

A1—0 to 6 inches; dark brown (10YR 4/3) fine sandy loam; weak fine and medium granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

A2—6 to 10 inches; dark brown (7.5YR 4/4) fine sandy loam; weak fine and medium granular structure; friable; some material from the A1 horizon; few fine roots; strongly acid; clear smooth boundary.

B21t—10 to 35 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; patchy clay films on ped faces; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

B22t—35 to 58 inches; red (2.5YR 4/8) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few pockets of uncoated sand grains; few brown concretions; very strongly acid; gradual wavy boundary.

B23t—58 to 80 inches; red (2.5YR 5/8) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few pockets of uncoated sand grains; few brown concretions; very strongly acid.

The A1 horizon is dark gray, dark grayish brown, very dark brown, or dark brown. The Ap and A2 horizons are dark brown, brown, pale brown, grayish brown, or light yellowish brown.

The upper part of the Bt horizon is yellowish red to red clay loam, sandy clay loam, or loam. The upper 20 inches of the Bt horizon is 18 to 33 percent clay. The lower part of the Bt horizon is yellowish red to red sandy loam or loam that has few to many pockets of uncoated sand grains.

The profile is strongly acid or very strongly acid.

Smithdale soils are associated with Lucy, McLaurin, Ruston, and Sweatman soils. They have a thinner A horizon than Lucy soils. They have finer texture in the B horizon than McLaurin soils. They have no bisequum horizons as do McLaurin and Ruston soils. They have coarser texture in the B horizon than Sweatman soils.

SdD2—Smithdale fine sandy loam, 8 to 12 percent slopes, eroded. This well drained soil is on side slopes.

The surface layer is brown fine sandy loam about 4 inches thick. The upper part of the subsoil is yellowish red sandy clay loam about 11 inches thick. The next layer is red sandy clay loam about 19 inches thick. The lower part of the subsoil, to a depth of about 60 inches, is red sandy loam. Below this, to below a depth of 75 inches, is yellowish red sandy loam.

Included with this soil in mapping were small areas of Lucy, Ruston, and Sweatman soils.

The soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is high. Runoff is rapid. The hazard of erosion is moderate to severe.

This soil has been eroded and in many areas the surface layer is a mixture of material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

Most areas of this soil are in pasture and woodland. This soil is well suited to pasture plants and pine trees. It should be in permanent cover most of the time, because erosion is a hazard to row crops. If this soil is in row crops, terracing, grassed waterways, stripcropping, conservation cropping, and crop residue management should be used. Capability unit IVe–1; woodland suitability group 2o1.

SdE—Smithdale fine sandy loam, 15 to 25 percent slopes. This well drained soil is on side slopes. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Lucy, Ruston, and Sweatman soils.

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

Most areas of this soil are in pine trees. Because of steepness of slope and a severe hazard of erosion, these soils should be in trees. This soil is well suited to pine trees. Capability unit VIIe–1; woodland suitability group 2o1.

SEF—Smithdale-Lucy association, hilly. This association consists mostly of well drained soils on uplands. It is characterized by narrow ridgetops that have steep side slopes. Slopes are 15 to 30 percent. Areas range from 160 to 500 acres in size. Areas of this association are generally larger than those of most other mapping units in the county, but mapping has been controlled well enough for the anticipated use of the soils. The pattern and extent of the soils are fairly uniform throughout the association. Each area contains these two soils and one or more less extensive soils.

This association is about 66 percent Smithdale and Lucy soils. Of this, about 43 percent is Smithdale soil and about 23 percent is Lucy soil. The rest of the association is Lakeland, McLaurin, and Ruston soils.

The Smithdale soil is mostly on the ridgetops and the upper and middle slopes. It has a surface layer of dark grayish brown fine sandy loam about 6 inches thick. The subsurface layer is pale brown fine sandy loam about 6 inches thick. The upper part of the subsoil is red sandy clay loam about 26 inches thick. The next layer, to a depth of 58 inches, is red loam. The lower subsoil, to a depth of about 80 inches, is red sandy loam.

The Smithdale soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is high. Runoff is rapid. The hazard of erosion is severe.

The Lucy soil is mostly on the middle and lower slopes. A Lucy soil in an area of this association has the profile described as representative of the series. It is strongly acid or very strongly acid. Permeability is moderately rapid, and available water capacity is low. Runoff is rapid.

Most areas of this association are in pine trees, which are well suited. Smithdale soil in capability unit VIIe-1, Lucy soil in capability unit VIIs–3; Smithdale soil in woodland suitability group 2o1, Lucy soil in woodland suitability group 3s2.

Stough series

The Stough series consists of somewhat poorly drained soils on uplands. The soils formed in loamy material. They have a slightly compact and brittle subsoil.

In a representative profile the surface layer is grayish brown fine sandy loam about 7 inches thick. The upper part of the subsoil, to a depth of 16 inches, is light yellowish brown to pale brown fine sandy loam that has grayish and brownish mottles. The next layer is mottled pale brown, gray, and yellowish brown loam about 23 inches thick. The lower part of the subsoil, to a depth of 70 inches, is sandy clay loam mottled in shades of gray and brown.

Representative profile of Stough fine sandy loam, 9 miles northeast of Bay Springs, on northeast side of Highway 18, SW¼SW¼ sec. 36, T. 3 N., R. 11 E.:

Ap—0 to 7 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.

B21t—7 to 13 inches; light yellowish brown (10YR 6/4) fine sandy loam; common fine faint light gray (10YR 7/1) and yellowish brown (10YR 5/6) mottles; weak fine granular and subangular blocky structure; sand grains coated and bridged with clay; friable; strongly acid; clear smooth boundary.

B22t—13 to 16 inches; pale brown (10YR 6/3) fine sandy loam; common fine faint gray (10YR 6/1) and yellowish brown (10YR 5/6) mottles; weak to moderate fine and medium subangular blocky structure; friable; slightly hard and brittle in yellowish brown part; sand grains coated and bridged with clay; strongly acid; clear smooth boundary.

B23t—16 to 39 inches; mottled pale brown (10YR 6/3), gray (10YR 6/1), and yellowish brown (10YR 5/8) loam; weak and moderate medium subangular blocky structure; friable; hard, slightly compact and brittle in yellowish brown part; hard; patchy clay films on ped faces; sand grains coated and bridged with clay; common fine pores; very strongly acid; gradual smooth boundary.

B24t—39 to 50 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; hard, slightly compact and brittle in yellowish brown part; polygonal cracks filled with gray loamy sand; very strongly acid; gradual wavy boundary.

B25t—50 to 70 inches; mottled gray (10YR 6/1) and strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; polygonal cracks filled with gray loamy sand; very strongly acid.

The A1 horizon is very dark gray, dark gray, or dark grayish brown. The Ap horizon is dark grayish brown, grayish brown, or pale brown.

The B2t horizon has matrix colors of light yellowish brown, pale brown, or yellowish brown and has gray mottles, or it is mottled in shades of brown, yellow, and gray. The Bt horizon is fine sandy loam, sandy loam, loam, or sandy clay loam. The upper 20 inches of the Bt horizon is 8 to 18 percent clay.

The soil is strongly acid or very strongly acid throughout, except in surface layer that has been limed.

Stough soils are associated with Adaton, Prentiss, and Savannah soils. They are better drained than Adaton soils. They are poorer drained than Prentiss soils. They have less clay in the B horizon than Savannah soils. They have no fragipan, whereas Prentiss and Savannah soils have a fragipan.

Sf—Stough fine sandy loam. This somewhat poorly drained soil is in broad areas. Slopes are 0 to 2 percent.

Included with this soil in mapping were small areas of Adaton, Prentiss, and Savannah soils. A few areas of soils have slopes of as much as 5 percent.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the soil and moderately slow in the lower part. Available water capacity is medium. Runoff is slow.

Approximately half the acreage of this soil is in cultivated crops and pasture. The rest is in woodland. This soil is well suited to cotton, corn, soybeans, small grain, pasture plants, adapted hardwoods, and pine trees. Row crops can be grown continuously if crop residue management, row arrangement, and field ditches are used. Capability unit IIw–3; woodland suitability group 2w8.

Sumter series

The Sumter series consists of well drained, calcareous soils on uplands. The soils formed in clayey material.

In the representative profile the surface layer is dark grayish brown clay about 5 inches thick. The upper part of the subsoil is light yellowish brown clay about 13 inches thick. The next layer, to a depth of about 35 inches, is light yellowish brown clay that has light gray mottles. The underlying material, to a depth of about 60 inches, is light gray to light brownish gray marly clay that has many mottles in shades of yellow and brown.

Representative profile of Sumter clay, 8 to 12 percent slopes, eroded, 1½ miles south of Garlandville and 50 feet east of road, NE¼NE¼ sec. 13, T. 4 N., R. 11 E.:

Ap—0 to 5 inches; dark grayish brown (2.5Y 4/2) clay; moderate fine and medium granular structure; friable; slightly plastic; many fine roots; few lime concretions; moderately alkaline; calcareous; clear smooth boundary.

B2—5 to 18 inches; light yellowish brown (2.5Y 6/4) clay; moderate medium subangular blocky structure; firm, plastic; few fine roots; many fine and medium lime nodules; moderately alkaline; calcareous; gradual wavy boundary.

B3—18 to 35 inches; light yellowish brown (2.5Y 6/4) clay; many medium faint light gray (2.5Y 7/2) mottles; moderate fine and medium subangular blocky structure; firm, plastic; few fine roots; many fine and medium lime nodules; moderately alkaline; gradual wavy boundary.

C1—35 to 46 inches; light gray (2.5Y 7/2) marly clay; many fine and medium distinct brownish yellow (10YR 6/6) mottles; moderate medium platy structure; firm, plastic; many fine and medium lime nodules; moderately alkaline; calcareous; gradual wavy boundary.

C2—46 to 60 inches; light brownish gray (2.5Y 6/2) marly clay; many fine distinct light olive brown mottles; weak medium platy structure; firm, plastic; many fine and medium lime nodules; moderately alkaline; calcareous.

The profile is mildly alkaline to moderately alkaline. Lime nodules range from few to many.

The Ap horizon is very dark grayish brown, dark grayish brown, or grayish brown.

The B horizon is silty clay loam, silty clay, or clay. The B2 horizon is pale yellow, pale olive, olive, or light yellowish brown. The B3 horizon is pale yellow, light olive brown, or light yellowish brown and has mottles in shades of gray, yellow, and brown.

The C horizon is light gray or light brownish gray and has mottles in shades of brown and yellow. It is clay or marly clay.

Sumter soils are associated with Louin, Okolona, and Vaiden soils. They are much shallower to chalk than these soils.

SmC2—Sumter clay, 2 to 8 percent slopes, eroded. This well drained, calcareous soil is in broad upland areas and on side slopes.

The surface layer is dark grayish brown clay about 3 inches thick. The upper part of the subsoil is pale yellow clay about 17 inches thick. The next layer, to a depth of about 32 inches, is pale yellow clay or silty clay that has yellow and light olive gray mottles. The underlying material, to a depth of 65 inches, is light gray clay that has yellow and light olive brown mottles.

Included with this soil in mapping were small areas of Louin, Okolona, and Vaiden soils.

This soil is mildly alkaline or moderately alkaline throughout. Permeability is slow, and available water

capacity is medium. Runoff is medium. The hazard of erosion is severe.

This soil has been eroded, and in many areas the surface layer is a mixture of material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

Most areas of this soil are in pasture. Because of the clayey texture, this soil is difficult to cultivate. It is suited to adapted pasture plants, soybeans, small grain, and eastern redcedar. Capability unit IIIe–7; woodland suitability group 4c2c.

SmD2—Sumter clay, 8 to 12 percent slopes, eroded. This well drained, calcareous soil is on side slopes. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Louin, Okolona, and Vaiden soils.

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

This soil has been eroded in many areas, and the surface layer is a mixture of material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

Most areas of this soil are in pasture. Because of clayey texture and slope, this soil is difficult to cultivate. It is suited to adapted pasture plants and eastern redcedar. Capability unit VIe–3; woodland suitability group 4c2c.

Susquehanna series

The Susquehanna series consists of somewhat poorly drained soils on uplands. The soils formed in clayey material. They have a firm clayey subsoil.

In a representative profile the surface layer is dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is grayish brown fine sandy loam about 4 inches thick. The upper part of the subsoil, to a depth of 24 inches, is red clay that has light brownish gray mottles in the lower part. The lower part of the subsoil, to a depth of about 70 inches, is a mottled gray, red, and brown clay.

Representative profile of Susquehanna fine sandy loam, 2 to 5 percent slopes, ½ mile north and ½ mile northwest of Southside School, 25 feet north of dirt road, SW¼SW¼ sec. 8, T. 1 N., R. 13 E.:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many fine roots; very strongly acid; clear smooth boundary.

A2—3 to 7 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure; friable; many fine roots; very strongly acid; clear smooth boundary.

B21t—7 to 13 inches; red (2.5YR 4/6) clay; strong medium angular blocky and subangular blocky structure; firm, plastic and sticky; shiny grooved faces of peds; strongly acid; gradual wavy boundary.

B22t—13 to 24 inches; red (2.5YR 4/6) clay; common fine distinct light brownish gray mottles; strong medium angular blocky and subangular blocky structure; firm, plastic and sticky; shiny grooved faces on peds; strongly acid; gradual wavy boundary.

B23t—24 to 31 inches; mottled red (2.5YR 4/6), light gray (10YR 7/2), and pale brown (10YR 6/3) clay; strong medium angular blocky and subangular blocky structure; firm, plastic and sticky; shiny grooved faces of peds; few slickensides that do not intersect; strongly acid; gradual wavy boundary.

B24t—31 to 49 inches; mottled light gray (10YR 7/2) and red (2.5YR 4/8) clay; strong medium angular blocky and subangular blocky structure; firm, plastic and sticky; shiny grooved faces of peds; few slickensides that do not intersect; strongly acid; gradual wavy boundary.

B25t—49 to 58 inches; mottled gray (10YR 6/1), red (2.5YR 4/8), and strong brown (7.5YR 5/6) clay; strong medium angular blocky structure; firm, very plastic and sticky; shiny grooved faces of peds; few streaks of sandy loam; many slickensides that do not intersect; strongly acid; gradual smooth boundary.

B26t—58 to 70 inches; mottled red (2.5YR 4/8), light gray (10YR 7/1), and yellowish brown (10YR 5/6) clay; strong medium angular blocky structure; firm, very plastic and sticky; shiny grooved faces on peds; few streaks of sandy loam; many slickensides that do not intersect; strongly acid.

The profile is very strongly acid or strongly acid.

The A1 horizon is very dark gray, dark gray, or dark grayish brown. The Ap and A2 horizons are dark grayish brown, grayish brown, dark brown, brown, or pale brown.

The B horizon is clay loam, silty clay, or clay and is 35 to 60 percent clay. The upper part of the Bt horizon is red or yellowish red and has few to many gray mottles in the upper 10 inches, or it is mottled in shades of gray, red, and yellow. The lower part of the Bt horizon is gray and has red, brown, and yellow mottles, or it is mottled in shades of red, brown, gray, and yellow.

Susquehanna soils are associated with Boswell and Sweatman soils. They differ from Boswell and Sweatman soils by having gray mottles in the upper 10 inches of the B horizon.

SnB—Susquehanna fine sandy loam, 2 to 5 percent slopes. This somewhat poorly drained soil is in broad upland areas. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Boswell and Sweatman soils.

This soil is strongly acid or very strongly acid. Permeability is very slow, and available water capacity is high. This soil tends to shrink and crack during dry periods. Runoff is medium. Where this soil is cultivated, the hazard of erosion is moderate to severe.

Most areas of this soil are in pasture or woodland. Some areas are in crops. This soil is well suited to pasture plants and pine trees. It should be in permanent

vegetation most of the time. If this soil is in row crops, terracing, grassed waterways, stripcropping, conservation cropping, and crop residue management should be used to prevent erosion. Capability unit IVe–5; woodland suitability group 3c2.

SnC2—Susquehanna fine sandy loam, 5 to 8 percent slopes, eroded. This somewhat poorly drained soil is on side slopes.

This soil has a surface layer of dark brown fine sandy loam about 4 inches thick. The upper part of the subsoil, to a depth of 12 inches, is red plastic clay that has gray mottles. The next layer, to a depth of 46 inches, is mottled red, gray, and yellow plastic clay. Below this layer, to a depth of 60 inches, is gray clay that has yellowish brown mottles.

Included with this soil in mapping were small areas of Boswell and Sweatman soils.

This soil has been eroded, and in most areas the surface layer is a mixture of material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

This soil is strongly acid or very strongly acid. Permeability is very slow, and available water capacity is high. This soil tends to shrink and crack during dry periods. Runoff is rapid. The hazard of erosion is severe.

Most areas of this soil are in pasture and pine trees. This soil is well suited to pine trees and pasture plants. It should be kept in permanent vegetation because of erosion. Capability unit VIe–2; woodland suitability group 3c2.

Sweatman series

The Sweatman series consists of well drained soils on uplands. The soils formed in clayey material over stratified shale, clay, and sandy material.

In a representative profile the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsoil is yellowish red clay about 13 inches thick over yellowish red clay, to a depth of 42 inches, that has brownish mottles. The underlying material, to a depth of about 70 inches, is stratified layers of red, brown, yellow, and gray weathered shale and sandy loam.

Representative profile of Sweatman fine sandy loam; 8 to 17 percent slopes, eroded, 5 miles north of Heidelberg and 100 feet west of Paulding-Heidelberg Road, SW¼NW¼ sec. 6, T. 1 N., R. 13 E.:

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

B21t–5 to 18 inches; yellowish red (5YR 4/8) clay; strong medium angular blocky and subangular blocky structure; firm, plastic; continuous clay films on ped faces; many fine and medium roots; very strongly acid; gradual wavy boundary.

B22t—18 to 30 inches; yellowish red (5YR 5/8) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium angular blocky and subangular blocky structure; firm, plastic and very sticky; continuous clay films on ped faces; few fine roots; very strongly acid; gradual wavy boundary.

B23t—30 to 42 inches; yellowish red (5YR 5/8) clay; common medium distinct pale brown (10YR 6/3) and strong brown (7.5YR 5/8) mottles; moderate medium angular blocky and subangular blocky structure; firm, plastic and sticky; patchy clay films on ped faces; few fine roots; few brown concretions; few small shale fragments; few mica flakes; very strongly acid; diffuse wavy boundary.

C—42 to 70 inches; stratified layers of light brownish gray (10YR 6/2) weathered shale and brownish yellow (10YR 6/8) sandy loam; structureless; friable to firm; few mica flakes; few iron crusts; strongly acid.

The profile is very strongly acid or strongly acid throughout, except where these soils are limed.

The Ap horizon is dark grayish brown, grayish brown, or brown.

The upper 20 inches of the B horizon is 35 to 50 percent clay. The upper part of the Bt horizon is yellowish red or red. It is silty clay loam, silty clay, or clay. The lower part of the Bt horizon is yellowish red to red and has brownish mottles.

The C horizon is stratified clay, shale, and sandy loam. The shale or clay is light brownish gray, red, or gray or is mottled in shades of these colors. The sandy loam is brownish yellow, yellowish brown, or strong brown.

Sweatman soils are associated with Boswell, Shubuta, Smithdale, and Susquehanna soils. They are better drained than Boswell and Susquehanna soils. They lack the high shrink-swell potential typical of Boswell and Susquehanna soils. They differ from Shubuta soils by having a clayey solum less than 60 inches thick. They have more clay in the subsoil than Smithdale soils.

StD2—Sweatman fine sandy loam, 8 to 17 percent slopes, eroded. This well drained soil is on side slopes. This soil has the profile described as representative of the series.

Included with this soil is mapping were small areas of Boswell, Shubuta, and Smithdale soils.

The soil is strongly acid or very strongly acid. Permeability is moderately slow, and available water capacity is high. Runoff is rapid. The hazard of erosion is moderate to severe. This soil has been eroded and in many areas the surface layer is a mixture of the original surface layer and the subsoil. Shallow gullies are present in many areas.

Most areas of this soil are in pasture or pine trees. This soil is suited to pasture plants. It is well suited to pine trees. This soil should be in permanent vegetation at all times, because of steep slopes and erosion. Capability unit VIe–1; woodland suitability group 3c2.

SwE2—Sweatman-Smithdale complex, 8 to 20 percent slopes, eroded. This complex consists mostly of well drained soils on hilly uplands. Areas range from 20 to 160 acres in size. These soils have been eroded; in many areas, the surface layer is a mixture of material from the original surface layer and the subsoil, and shallow gullies are present.

This complex is about 57 percent Sweatman and Smithdale soils. Of this, about 34 percent is Sweatman soils and about 23 percent is Smithdale soils. The rest of the complex is Lucy and McLaurin soils.

The Sweatman soil is mostly on the side slopes. The surface layer is dark grayish brown fine sandy loam about 4 inches thick, and the subsurface layer is brown fine sandy loam about 4 inches thick. The subsoil, to a depth of 38 inches, is red clay that has strong brown and yellowish brown mottles in the lower part. The substratum is stratified layers of red, gray, yellow, and brown clay, weathered shale, and sandy loam.

The Sweatman soil is strongly acid or very strongly acid. Permeability is moderately slow, and available water capacity is high. Runoff is rapid.

The Smithdale soil is mostly on the narrow ridgetops and upper side slopes. The surface layer is dark grayish brown fine sandy loam about 4 inches thick and is over a subsurface layer of brown fine sandy loam about 11 inches thick. The upper part of the subsoil is yellowish red sandy clay loam about 25 inches thick and is over yellowish red sandy loam that extends to a depth of more than 70 inches.

The Smithdale soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is high. Runoff is rapid.

Most areas of this complex are in pine trees. Because of the steepness of slopes and rapid runoff, this complex is better suited to trees than to most other uses. Capability unit VIIe–2; woodland suitability group 3c2.

SXE—Sweatman association, hilly. This association consists mostly of well drained soils on uplands. It is characterized by narrow ridgetops that have side slopes. Slopes range from 15 to 30 percent. Areas range from 160 to 700 acres in size. Areas of this association are generally larger than those of most other mapping units in the county, but mapping has been controlled well enough for the anticipated use of the soils. The pattern and extent of the soils are fairly uniform throughout the association. Each area contains Sweatman soils and one or more less extensive soils.

This association is about 70 percent Sweatman soil. The rest consists of Boswell and Smithdale soils.

The Sweatman soil is mostly on the narrow ridgetops and the upper part of the side slopes. It has a surface layer that is dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is grayish brown fine sandy loam about 5 inches thick. The subsoil, to a depth of about 40 inches, is red clay. The substratum is mottled red and gray stratified weathered shale, clay, and sandy loam.

The Sweatman soil is strongly acid or very strongly acid. Permeability is moderately slow, and available water capacity is high. Runoff is rapid.

The Boswell soil is mostly on the bottom of the side slopes.

Most areas of the association are in pine forest. Because of the steepness of slope and severe hazard of erosion, this association is better suited to trees than to most other uses. Capability unit VIIe–2; woodland suitability group 3c2.

SYE—Sweatman-Smithdale association, hilly. This association consists mostly of well drained soils on uplands. It is characterized by narrow ridgetops that have side slopes. Slopes range from 15 to 30 percent. Areas range from 160 to 900 acres in size. Areas of this association are generally larger than those of most other mapping units in the county, but mapping has been controlled well enough for the anticipated use of the soils. The pattern and extent of the soils are fairly uniform throughout the association. Each area contains these two soils and one or more less extensive soils.

This association is about 64 percent Sweatman and Smithdale soils. Of this, about 42 percent is Sweatman soil and about 22 percent is Smithdale soil. The rest of the association is Lucy, Susquehanna, and Troup soils.

The Sweatman soil is mostly on the side slopes, and it extends from the top of the slopes to the bottom. It has a surface layer of dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is brown fine sandy loam about 6 inches thick. The subsoil is a red clay about 20 inches thick over red clay, to a depth of about 38 inches, that has pale brown and yellowish brown mottles. The substratum is a stratified layer of red, yellow, brown, and gray weathered shale, clay, and sandy loam.

The Sweatman soil is strongly acid or very strongly acid. Permeability is moderately slow, and available water capacity is high. Runoff is rapid.

The Smithdale soil is mostly on narrow ridgetops and upper side slopes. It has a surface layer that is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is brown sandy loam about 8 inches thick. The upper part of the subsoil, to a depth of about 40 inches, is yellowish red sandy clay loam or loam. The lower part of the subsoil is yellowish red sandy loam.

The Smithdale soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is high. Runoff is rapid.

Most areas of this association are in pine trees. Because of steepness of slope and rapid runoff, this association is better suited to trees than to most other uses. Sweatman soil in capability unit VIIe–2, Smithdale soil in capability unit VIIe–1; Sweatman soil in woodland suitability group 3c2, Smithdale soil in woodland suitability group 2o1.

Troup series

The Troup series consists of well drained soils on uplands. The soils formed in loamy and sandy material.

In a representative profile the surface layer is dark grayish brown loamy sand about 7 inches thick. The subsurface layer is strong brown or light brown loamy sand about 52 inches thick. The upper part of the subsoil is yellowish red sandy loam about 8 inches thick. The lower part of the subsoil, to a depth of 88 inches, is red sandy loam.

Representative profile of Troup loamy sand, 8 to 12 percent slopes, ¾ mile north of Missionary and 100 feet east of road, SW¼NE¼ sec. 10, T. 3 N., R. 12 E.:

A1—0 to 7 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable and loose; many fine roots; very strongly acid; clear wavy boundary.

A21—7 to 18 inches; strong brown (7.5YR 5/6)

loamy sand; single grained; very friable and loose; some mixing from above horizon; few fine roots; very strongly acid; gradual wavy boundary.

A22—18 to 41 inches; light brown (7.5YR 6/4) loamy sand; single grained; very friable and loose; few fine roots; few small brown concretions and pebbles; very strongly acid; gradual wavy boundary.

A23—41 to 59 inches; strong brown (7.5YR 5/6) loamy sand; streaks of yellowish red sandy loam about 1/8 inch wide; single grained; very friable and loose; few fine roots; very strongly acid; gradual wavy boundary.

B21t—59 to 67 inches; yellowish red (5YR 4/8) sandy loam; horizontal streaks of reddish yellow sand about 1/8 inch wide; weak medium subangular blocky structure; friable; slightly compact and brittle in places; very strongly acid; gradual wavy boundary.

B22t—67 to 88 inches; red (2.5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid.

The profile is strongly acid or very strongly acid.

The A horizon ranges from 40 to 72 inches in thickness. The A1 horizon is very dark grayish brown or dark grayish brown. The A2 horizon is pale brown, light brown, brown, strong brown, yellowish brown, or reddish yellow.

The Bt horizon is red, yellowish red, reddish yellow, or strong brown sandy loam or sandy clay loam.

The C horizon, where present, is normally thinly bedded varicolored sandy clay loam and sandy loam material.

Troup soils are associated with Heidel, Lakeland, and Lucy soils. They have a thicker A horizon than Heidel and Lucy soils. They have a B horizon of sandy loam or sandy clay within a depth of 72 inches, whereas Lakeland soils have no B horizon.

TrD—Troup loamy sand, 8 to 12 percent slopes. This well drained soil is on side slopes. It has the profile described as representative of the series.

The soil is strongly acid or very strongly acid. Permeability is rapid, and available water capacity is low. Runoff is slow. The hazard of erosion is moderate.

Most areas of this soil are in woodland. Small areas are in pasture. This soil is better suited to permanent vegetation because of steepness of slopes and droughtiness. It is suited to pine trees and adapted pasture grasses, but plants are difficult to establish because of low available water capacity. Capability unit VIs–2; woodland suitability group 3s2.

Una series

The Una series consists of poorly drained soils on flood plains. The soils formed in clayey alluvium.

In a representative profile the surface layer is dark gray silty clay loam about 4 inches thick. The subsoil, to a depth of 65 inches, is gray silty clay that has brownish mottles.

Representative profile of Una silty clay loam, in an area of Una-Urbo complex, frequently flooded, 4 miles northwest of Louin on Louin-Pineville road and 1/4 mile west of road, SW1/4SW1/4 sec. 8, T. 3 N., R. 10 E.:

A1—0 to 4 inches; dark gray (10YR 4/1) silty clay loam; moderate medium granular structure; friable; plastic and sticky; many fine roots; strongly acid; abrupt smooth boundary.

B21g—4 to 8 inches; gray (10YR 5/1) silty clay; common medium distinct dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm, plastic and sticky; few fine roots; strongly acid; clear smooth boundary.

B22g—8 to 15 inches; gray (10YR 5/1) silty clay; many medium distinct dark yellowish brown (10YR 4/4) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm, very plastic and sticky; rew fine black concretions; few fine roots; strongly acid; gradual smooth boundary.

B23g—15 to 36 inches; gray (10YR 6/1) silty clay; many coarse distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm, very plastic and very sticky; very strongly acid; gradual smooth boundary.

B24g—36 to 46 inches; gray (10YR 6/1) silty clay; many medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; very firm, very plastic and very sticky; few fine black and brown concretions; very strongly acid; gradual smooth boundary.

B25g—46 to 65 inches; gray (10YR 6/1) silty clay; few medium distinct dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; very firm, very plastic and very sticky; very strongly acid.

The profile is strongly acid or very strongly acid.

The A horizon is dark gray, very dark grayish brown, or dark grayish brown.

The B horizon is gray and has few to many mottles of brown and yellow. It is silty clay loam, silty clay, or clay. Between 10- to 40-inches of depth it is 35 to 60 percent clay.

Una soils are associated with Leeper and Urbo soils. They are poorer drained than these soils. They are more acid than Leeper soils.

Un—Una-Urbo complex, frequently flooded. This complex consists mainly of poorly drained and somewhat poorly drained soils on flood plains. Areas range from 10 to 160 acres in size. The flood plains range from 300 feet to 1/4 mile in width. Slopes range from 0 to 2 percent. This complex is flooded frequently during winter and spring.

This complex is about 94 percent Una and Urbo soils. Of this, about 48 percent is Una soils and 46 percent is Urbo soils. The rest of the complex consists of soils that are better drained and have less clay in the subsoil than Una and Urbo soils.

The Una soil is on the lower parts of the landscape away from the channel. It is strongly acid or very strongly acid. Permeability is very slow, and available water capacity is high. Runoff is very slow.

The Urbo soil is on the higher parts of the landscape adjacent to the stream channel. It has a surface layer of dark grayish brown silty clay loam about 5 inches thick. The upper part of the subsoil, to a depth of 14 inches, is brown silty clay that has few light brownish gray mottles. The lower part of the subsoil is gray clay that has brownish yellow, yellowish brown, or strong brown mottles.

The Urbo soil is strongly acid or very strongly acid. Permeability is very slow, and available water capacity is high. Runoff is very slow.

Most areas of this complex are in woodland. This complex is suited to hardwood trees. It is suited to pasture plants if proper drainage is provided. Capability unit IVw–1; Una soil in woodland suitability group 2w6, Urbo soil in woodland suitability group 1w6.

Urbo series

The Urbo series consists of somewhat poorly drained soils on flood plains. The soils formed in clayey alluvium.

In a representative profile the surface layer is dark brown silty clay loam about 6 inches thick. The upper part of the subsoil, to a depth of 16 inches, is dark yellowish brown silty clay that has light brownish gray mottles. The lower part of the subsoil, to a depth of 65 inches, is gray silty clay that has mottles in shades of red and brown.

Representative profile of Urbo silty clay loam, in an area of Urbo association, frequently flooded, 3 miles southwest of Montrose and 500 feet west of West Tallahala Creek, SW¼SE¼ sec. 9, T. 3 N., R. 10 E.:

A—0 to 6 inches; dark brown (10YR 4/3) silty clay loam; weak medium granular structure; firm, slightly plastic; many fine roots; strongly acid; abrupt smooth boundary.

B21–6 to 16 inches; dark yellowish brown (10YR 4/4) silty clay; many medium faint light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; firm, plastic; few fine roots; very strongly acid; gradual wavy boundary.

B22g—16 to 30 inches; gray (10YR 6/1) silty clay; many medium prominent yellowish red (5YR 4/8) mottles and many medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; firm, plastic; few large roots; very strongly acid; gradual wavy boundary.

B23g—30 to 45 inches; gray (10YR 6/1) silty clay; common medium prominent yellowish red (5YR 4/8) mottles and few medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm, plastic; few pressure faces on peds; few brown concretions; very strongly acid; gradual wavy boundary.

B24g—45 to 65 inches; gray (10YR 6/1) silty clay; many medium distinct strong brown (7.5YR 5/6) mottles and few medium prominent red (2.5YR 4/6) mottles; weak medium subangular blocky structure; firm, plastic; few brown concretions; very strongly acid.

The profile is strongly acid to very strongly acid.

The A horizon is dark grayish brown, grayish brown, or dark brown.

The B horizon is silty clay loam, clay loam, or silty clay. Between 10- to 40-inches in depth it is 40 to 55 percent clay. The upper part of the B horizon is grayish brown, dark grayish brown, brown, or dark yellowish brown and has few to many mottles in shades of gray, brown, or yellow. The lower part of the B horizon is grayish brown, dark grayish brown, light brownish gray, or gray and has mottles in shades of yellow, red, or brown.

Urbo soils are associated with Leeper, Marietta, and Una soils. They are more acid throughout than Leeper and Marietta soils. They are better drained than Una soils.

UR—Urbo association, frequently flooded. This association consists mostly of somewhat poorly drained Urbo soil on flood plains. These flood plains range from ⅛ mile to 1 mile in width. They are flooded frequently during winter and spring. Slopes are 0 to 2 percent. Areas range from 160 to 500 acres in size. This association is more variable than most of the other mapping units in the county, but mapping has been controlled well enough for the anticipated use of the soils. The pattern and extent of the soils are fairly uniform throughout the association. Each area contains Urbo soil and one or more less extensive soils.

This association is about 60 percent Urbo soil. The rest is Leeper, Marietta, and Una soils.

An Urbo soil in an area of this association has the profile described as representative of the series.

The Urbo soil is strongly acid or very strongly acid. Permeability is very slow, and available water capacity is high. Runoff is very slow.

Most areas of this association are in woodland. This association is well suited to bottom-land hardwoods. It is suited to pasture plants if proper drainage is provided. Capability unit Vw–3; woodland suitability group 1w6.

Vaiden series

The Vaiden series consists of somewhat poorly drained soils on uplands. The soils formed in beds of acid clay overlying marly clay or chalk.

In a representative profile the surface layer is dark brown silty clay loam about 2 inches thick. The upper part of the subsoil, to a depth of about 11 inches, is yellowish brown clay that has yellowish red and pale brown mottles. The lower part of the subsoil, to a depth of about 24 inches, is mottled brown and gray clay. The underlaying material, to a depth of 58 inches, is mottled brown, gray, and red clay. Below this, to a depth of 68 inches, it is gray clay that has yellowish red mottles.

Representative profile of Vaiden silty clay loam, 2 to 5 percent slopes, in woodland, 1½ miles northeast of Montrose and 1½ miles north and ¼ mile west of road, NE¼NE¼ sec. 25, T. 4 N., R. 10 E.:

A1—0 to 2 inches; dark brown (10YR 4/3) silty clay loam; moderate fine granular structure; firm, plastic; many fine and medium roots; very strongly acid; clear wavy boundary.

B21t—2 to 11 inches; yellowish brown (10YR 5/6) clay; common fine and medium prominent yellowish red (5YR 4/8) mottles and common fine and medium faint pale brown (10YR 6/3) mottles; moderate fine and medium subangular blocky and angular blocky structure; very firm, very plastic; common fine and medium roots; very strongly acid; gradual wavy boundary.

B22t—11 to 24 inches; mottled strong brown (7.5YR 5/6), light gray (10YR 7/2), and yellowish brown (10YR 5/6) clay; moderate fine and medium subangular blocky and angular blocky structure; very firm, very plastic; shiny faces on some peds; common fine roots; very strongly acid; gradual wavy boundary.

C1—24 to 30 inches; mottled light brownish gray (2.5Y 6/2), yellowish brown (10YR 5/6), and yellowish red (5YR 4/8) clay; moderate fine and medium angular blocky and subangular blocky structure; very firm, very plastic; few intersecting slickensides; few fine roots; very strongly acid; gradual wavy boundary.

C2—30 to 40 inches; mottled light olive brown (2.5Y 5/6) and light brownish gray (2.5Y 6/2) clay; intersecting slickensides parting to fine wedge-shaped fragments; very firm, very plastic; shiny ped faces; few fine roots; few black concretions; neutral; gradual irregular boundary.

C3—40 to 58 inches; mottled yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2) clay; intersecting slickensides parting to fine wedge-shaped fragments; very firm, very plastic; fine to coarse lime nodules; few fine roots; mildly alkaline; gradual irregular boundary.

C4—58 to 68 inches; light gray (2.5Y 7/2) clay; few coarse prominent yellowish red (5YR 4/8) mottles, coarse intersecting slickensides parting to fine wedge-shaped fragments; few fine roots; mildly alkaline.

The A1 horizon is very dark grayish brown, grayish brown, dark grayish brown, or dark brown.

The B horizon is light olive brown or yellowish brown mottled with shades of gray, brown, and red. In some profiles it is mottled in shades of red, yellow, brown, and gray. The B horizon is 60 to 70 percent clay. It is very strongly acid or slightly acid.

The C horizon is mottled gray, yellow, brown, and red, or it is gray and has mottles in shades of yellow, brown, and red. It is clay or marly clay. It is very strongly acid to mildly alkaline.

Vaiden soils are associated with Freest, Louin, Okolona, and Sumter soils. They have more clay in the subsoil than Freest soils. They have a clayey Bt horizon, which Louin soils lack. They are more acid above a depth of 30 inches than Okolona and Sumter soils.

VaB—Vaiden silty clay loam, 2 to 5 percent slopes. This somewhat poorly drained soil is in broad upland areas. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Freest, Louin, Okolona, and Sumter soils.

This soil is slightly acid to very strongly acid in the upper part and very strongly acid to mildly alkaline in the lower part. Permeability is very slow, and available water capacity is medium. Runoff is medium. The hazard of erosion is slight to moderate.

Most areas of this soil are in woodland. Small areas are in pasture and row crops. This soil is well suited to adapted hardwoods and pine trees. It is suited to cotton, corn, soybeans, small grain, and pasture plants. Where soil erosion is a hazard to row crops, it can be controlled if terraces, grassed waterways, row arrangement, stripcropping, and crop residue management are used. Capability unit IIIe–8; woodland suitability group 3c8.

VaC—Vaiden silty clay loam, 5 to 8 percent slopes. This somewhat poorly drained soil is on ridgetops and side slopes.

The surface layer is dark grayish brown silty clay loam about 3 inches thick. The upper part of the subsoil, to a depth of 24 inches, is light olive brown clay that has yellowish red and very pale brown mottles in the lower part. The next layer, to a depth of more than 60 inches, is mottled yellow and gray clay.

This soil is very strongly acid to slightly acid in the upper part and very strongly acid to mildly alkaline in the lower part. Permeability is very slow, and available water capacity is medium. Runoff is medium. The hazard of erosion is moderate.

Most areas of this soil are in woodland. Some small areas are in pasture and row crops. This soil is well suited to adapted hardwoods and pine trees. It is suited to small grain and pasture plants. Where soil erosion is a hazard, terracing, grassed waterways, stripcropping, conservation cropping system, and crop residue management should be used to control erosion. Capability unit IVe–6; woodland suitability group 3c8.

VaD2—Vaiden silty clay loam, 8 to 12 percent slopes, eroded. This somewhat poorly drained soil is on side slopes.

The surface layer is very dark grayish brown silty clay loam about 3 inches thick. The upper part of the subsoil, to a depth of about 8 inches, is yellowish brown clay that has pale brown mottles. It is underlain, to a depth of about 36 inches, by mottled gray, yellowish brown, and red clay. The lower part of the subsoil, to a depth of 65 inches, is gray clay that has yellowish brown mottles.

The soil is slightly acid to very strongly acid in the upper part of the subsoil and very strongly acid to mildly alkaline in the lower part of the subsoil. Per-

meability is very slow, and available water capacity is medium. Runoff is rapid. The hazard of erosion is severe. This soil has been eroded, and in many areas the surface layer is a mixture of material from the original surface layer and the subsoil. Shallow gullies are present in many areas.

Most areas of this soil are in woodland and pasture. Because of the steepness of slopes and severe hazard of erosion, this soil is better suited to permanent vegetation and trees than to most other uses. It is suited to pasture grasses, adapted hardwoods, and pine trees. Capability unit VIe–4; woodland suitability group 3c8.

Use and management of the soils

The use and management of the soils of Jasper County for crops, pasture, woodland, wildlife, and engineering are discussed in this section. This section explains the management of soils and gives the estimated yields of the main crops grown. It also explains how soils can be managed for woodland and wildlife habitat.

Crops and pasture

Using the soils for cultivated crops reduces the organic matter content, leaches out plant nutrients, and increases the hazard of erosion. Cropping systems are needed to maintain organic matter content, to control erosion, and to increase the fertility of the soils.

Close-growing or sod crops and annual cover crops grown in sequence with row crops maintain the organic matter content, control erosion, and build up the fertility of the soils. The length of time that cover is needed, in proportion to the length of time that a row crop is grown, depends on the kind of soil, the slope, and the hazard of erosion. Crop residue should be shredded after the harvest and left on the surface of the soil or disked into the surface layer if there is a hazard of flooding.

Fertilizers are beneficial to crops. The need for fertilizer varies from soil to soil and from crop to crop. Soil tests determine the correct amount and kind of fertilizer to add. Information on use of fertilizers can be obtained from the local Cooperative Extension Service and from the Mississippi Agricultural and Forestry Experiment Station.

On some soils in the county, such as Bibb, Marietta, and Una soils, establishing surface and internal drainage is a concern in management. Drainage mains and laterals that have surface field drains leading to them are needed on these soils. Diversions are needed to protect the bottom lands from receiving excessive water from the hills. Contour cultivation is needed on gently sloping soils to control erosion and conserve moisture.

In using the soils for pasture, good well-managed sods of grasses and legumes protect the soils 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 are well suited to the soils of Jasper County. It is a good practice for farmers to obtain help from the local office of the Soil Conservation regarding suitable plants and combinations of plants for pasture on a given soil. The type of livestock enterprise and the individual needs of the farmer should also be considered.

Perennial grasses that are suited to the soils are common bermudagrass, Coastal bermudagrass, bahiagrass, dallisgrass, and tall fescue. Legumes that are well suited are white clover, crimson clover, wild winter peas, annual lespedeza, and sericea lespedeza.

Regular applications of fertilizers and lime are feasible on all pasture. The amount and kind of fertilizer and the frequency of application should be determined by a soil test.

Grasses and legumes grow better and produce more usable forage if grazing is controlled by proper stocking and rotation grazing.

Capability grouping

Some readers, particularly those who farm on a large scale, may find it practical to use and manage alike some of the different kinds of soil on their farm. These readers can make good use of the capability classification system, a grouping that shows, in a general way, the suitability of soils for most kinds of farming.

The grouping is based on permanent limitations of soils when used for field crops, the risk of damage when they are farmed, and the way the soils 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 to horticultural crops or other crops that require special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations for range, for forest trees, or for engineering.

In the capability system, all kinds of soil are grouped at three levels: the class, the subclass, and the unit. The broadest grouping, the capability class, is designated by Roman numerals I to VIII. In class I are the soils that have the fewest limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and land forms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products. The subclass indicates major kinds of limitations within the classes. Within most of the classes there can be up to 4 subclasses. The subclasses are indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter "e" shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; "w" means 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 mainly because it is shallow, droughty, or stony; and "c" indicates that the chief limitation is climate that is too cold, or too dry.

[2] H. S. SAUCIER, conservation agronomist, Soil Conservation Service, helped to prepare this section.

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

Subclasses are further divided into groups called capability units. These are groups of soils that are so much alike that they are suited to the same crops and pasture plants, they require about the same management, and they have generally similar productivity and other response to management. Capability units are generally identified by numbers assigned locally, for example, IIe–1 or IIIw–2.

The following is a descriptive list of the classes, subclasses, and capability units in Jasper County.

Class I. Soils that have few limitations that restrict their use. (None in Jasper County.)

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

Subclass IIe. Soils that are subject to moderate erosion if they are not protected.

Unit IIe–1. Soils that are deep and well drained, have a subsoil of loam to sandy clay loam, and have slopes of 2 to 5 percent.

Unit IIe–2. Soils that are deep and well drained, have a subsoil of sandy loam, and have slopes of 2 to 5 percent.

Unit IIe–3. Soils that are moderately well drained, have a subsoil of loam to clay loam, and have slopes of 2 to 5 percent.

Unit IIe–4. Soils that are well drained, have a clayey subsoil, and have slopes of 2 to 5 percent.

Unit IIe–5. Soils that are moderately well drained, have a fragipan, and have slopes of 2 to 5 percent.

Unit IIe–6. Soils that are well drained, have an alkaline clayey subsoil, and have slopes of 1 to 3 percent.

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

Unit IIw–1. Soils that are moderately well drained and somewhat poorly drained and loamy; on flood plains.

Unit IIw–2. Soils that are moderately well drained, have a fragipan, and have slopes of 0 to 2 percent.

Unit IIw–3. Soils that are somewhat poorly drained and have a subsoil of sandy loam to sandy clay loam, and have slopes of 0 to 2 percent.

Unit IIw–4. Soils that are moderately well drained, have a subsoil of loam to clay loam, and have slopes of 0 to 2 percent.

Unit IIw–5. Soils that are somewhat poorly drained, nonacid, and clayey; on flood plains.

Unit IIw–6. Soils that are moderately well drained, nonacid, and silty; on flood plains.

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

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

Unit IIIe–1. Soils that are deep and well drained, have a subsoil of loam to sandy clay loam, and have slopes of 5 to 8 percent.

Unit IIIe–2. Soils that are deep and well drained, have a subsoil of sandy loam, and have slopes of 5 to 8 percent.

Unit IIIe–3. Soils that are moderately well drained, have a subsoil of loam to clay loam, and have slopes of 5 to 8 percent.

Unit IIIe–4. Soils that are well drained, have a subsoil of clay, and have slopes of 5 to 8 percent.

Unit IIIe–5. Soils that are moderately well drained, have a fragipan, and have slopes of 5 to 8 percent.

Unit IIIe–6. Soils that are moderately well drained, have a subsoil of clay, and have slopes of 2 to 5 percent.

Unit IIIe–7. Soils that are well drained, have an alkaline clayey subsoil, and have slopes of 2 to 8 percent.

Unit IIIe–8. Soils that are somewhat poorly drained, have an acid clayey subsoil underlain by alkaline clays, and have slopes of 2 to 5 percent.

Subclass IIIw. Soils that have severe limitations because of excess water.

Unit IIIw–1. Soils that are somewhat poorly drained, have a clayey subsoil, and have slopes of 0 to 2 percent.

Unit IIIw–2. Soils that are poorly drained, have a subsoil of silty clay loam, and have slopes of 0 to 2 percent.

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

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

Unit IVe–1. Soils that are deep and well drained, have a subsoil of loam to sandy clay loam, and have slopes of 8 to 12 percent.

Unit IVe–2. Soils that are deep and well drained, have a subsoil of sandy loam, and have slopes of 8 to 12 percent.

Unit IVe–3. Soils that are moderately well drained, have a fragipan, and have slopes of 8 to 12 percent.

Unit IVe–4. Soils that are moderately well drained, have a clayey subsoil, and have slopes of 5 to 8 percent.

Unit IVe–5. Soils that are somewhat poorly drained, have a clayey subsoil underlain by acid clays, and have slopes of 2 to 5 percent.

Unit IVe–6. Soils that are somewhat poorly drained, have an acid clayey

subsoil underlain by alkaline clays, and have slopes of 5 to 8 percent.

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

Unit IVw–1. Soils that are poorly drained and somewhat poorly drained, acid, frequently flooded, and clayey; on flood plains.

Class V. Soils that are not erodible but have other limitations, impractical to remove, that limit their use largely to pasture, woodland, or wildlife food and cover.

Subclass Vw. Soils that are too wet for cultivation; drainage or protection from flooding is not feasible.

Unit Vw–1. Soils that are poorly drained, acid, frequently flooded, and loamy; on flood plains.

Unit Vw–2. Soils that are somewhat poorly drained, moderately well drained, and well drained and are frequently flooded, acid, and loamy; on flood plains. Some are high in silt content.

Unit Vw–3. Soils that are somewhat poorly drained, frequently flooded, acid, and clayey; on flood plains.

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

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

Unit VIe–1. Soils that are well drained, have a clayey subsoil, and have slopes of 8 to 17 percent.

Unit VIe–2. Soils that are somewhat poorly drained, have a clayey subsoil underlain by acid clay, and have slopes of 5 to 8 percent.

Unit VIe–3. Soils that are well drained, have an alkaline clayey subsoil, and have slopes of 8 to 12 percent.

Unit VIe–4. Soils that are somewhat poorly drained, have an acid clayey subsoil underlain by alkaline clay, and have slopes of 8 to 12 percent.

Subclass VIs. Soils that are generally unsuited to cultivation and limited for other uses because of low available water capacity.

Unit VIs–1. Soils that are excessively drained, have very rapid permeability, and have slopes of 5 to 12 percent.

Unit VIs–2. Soils that are well drained, have rapid permeability, and have slopes of 8 to 12 percent.

Class VII. Soils that have very severe limitations that make them unsuited to cultivation and restrict their use largely to pasture, woodland, or wildlife food and cover.

Subclass VIIe. Soils that are very severely limited, chiefly by risk of erosion unless protective cover is maintained.

Unit VIIe–1. Soils that are well drained, have a subsoil of loam to sandy clay loam, and have slopes of 15 to 30 percent.

Unit VIIe–2. Soils that are well drained, have a clayey or loamy subsoil, and have slopes of 8 to 30 percent.

Unit VIIe–3. Soils that are well drained, have a subsoil of sandy loam, and have slopes of 12 to 30 percent.

Subclass VIIw. Soils that have very severe limitations because of excess water.

Unit VIIw–1. Soils that are very poorly drained and acid; on flood plains.

Subclass VIIs. Soils that have very severe limitations because of low available water capacity, stones, and other features.

Unit VIIs–1. Soils that are excessively drained; have very rapid permeability, and have slopes of 12 to 30 percent.

Unit VIIs–2. Soils that are well drained, have rapid permeability, and have slopes of 15 to 30 percent.

Unit VIIs–3. Soils that are well drained, have moderately rapid permeability, and have slopes of 15 to 30 percent.

Class VIII. Soils and landforms that have limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife habitat, water supply, or esthetic purposes. (None in Jasper County.)

Estimated yields

The soils of Jasper County vary widely in productivity. Some soils consistently produce high yields of cultivated crops, and others are better suited to less intensive uses.

Table 2 gives estimated average yields per acre of common crops grown under high-level management, but not irrigated. The yields obtained are based on estimates by agronomists, soil scientists, and others who have had experience with the crops and the soils of this county. Data on yields obtained in experiments were adjusted to reflect the combined influence of slope and management. If such data were not available, estimates were made using available information for similar soils.

The following practices of high level management were assumed in estimating the yields: fertilizer and lime are applied according to the results of soil tests; proper tillage is practiced and crop residue is used; suitable varieties are planted; soil-conserving cropping systems are used; and other conservation practices are used to improve production.

Estimates are not given for those soils that are not suited to a specific crop. They are also not given for crops not commonly grown in the county or for crops grown only on a small acreage.

Woodland

Originally, Jasper County was mainly wooded. Now, trees cover about 70 percent of the county.

Good stands of commercial trees are produced in

TABLE 2.—*Estimated yields per acre of crops and pasture plants*

[All yields were estimated for a high level of management in 1974. Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil series and map symbol	Cotton (lint)	Corn	Soybeans	Improved bermudagrass	Bahiagrass	Tall fescue
	Lb	*Bu*	*Bu*	*AUM* [1]	*AUM* [1]	*AUM* [1]
Adaton: Ad	550	70	30	8.0	8.0	9.0
Bassfield: BaB	650	70	25	9.5	8.0	
Bibb: Bb						8.0
Boswell:						
BoB	400	45			6.5	
BoC					6.0	
Dorovan: Do						
Freest:						
FrA	450	50	25	7.0		7.0
FrB	400	40	25	7.0		7.0
FrC	350		20	6.5		6.5
Heidel:						
HeD			20	7.5	6.0	
HeE, HTF					5.0	
For Troup part of HTF, see Troup series.						
Jena: Je						
Kirkville:						
Kk	675	93	38		10.0	10.3
For Mantachie part of Kk, see Mantachie series.						
KR					8.0	8.0
For Jena part of KR, see Jena series.						
Lakeland:						
LaD				6.5	6.5	
LaE				6.0	6.0	
Leeper: Le	750	80	40	12.0		11.0
Louin: Lo					7.0	
Lucy						
Mantachie: MM					8.0	8.0
For Mathiston part of MM, see Mathiston series.						
Marietta: Mr	750	90	40	12.0	10.5	12.0
Mathiston					9.0	9.0
McLaurin:						
MuB		75	30	10.0	8.0	
MuC		70	25	8.5	7.0	
Okolona: OkB2	650	60	35	10.5	8.5	9.0
Ora:						
OrB2	700	80	35	8.5	9.0	8.0
OrC2	600	70	30	8.0	8.5	7.5
OrD2				7.0	8.0	7.0
Prentiss:						
PrA	750	85	30	9.0	9.0	8.0
PrB	750	80	30	9.0	9.0	8.0
Ruston:						
RuB	700	80	30	12.0	12.0	
RuC	650	75	25	12.0	12.0	

TABLE 2.—*Estimated yields per acre of crops and pasture plants*—Continued

Soil series and map symbol	Cotton (lint)	Corn	Soybeans	Improved bermudagrass	Bahiagrass	Tall fescue
	Lb	*Bu*	*Bu*	*AUM* [1]	*AUM* [1]	*AUM* [1]
Savannah:						
SaA	700	80	35	8.5	9.0	8.0
SaB	650	75	35	8.5	9.0	8.0
SaC	600	70	30	8.0	9.0	7.5
Shubuta:						
SbB2	600	55	30	9.5	9.0	
SbC	500	50	25	9.0	8.0	
Smithdale:						
SdD2	400	50	25	9.0	9.0	
SdE				9.0	9.0	
SEF						
For Lucy part of SEF, see Lucy series.						
Stough: Sf	725	80	25	8.0	8.0	8.0
Sumter:						
SmC2			30		6.5	
SmD2					5.0	
Susquehanna:						
SnB			20		6.5	7.5
SnC2					5.5	6.5
Sweatman:						
StD2					5.5	
SwE2, SXE, SYE						
Troup:						
Troup part of HTF					5.0	
TrD				6.5	5.0	
Una: Un			20			7.0
For Urbo part of Un, see Urbo series.						
Urbo:						
Urbo part of Un			20			7.0
UR				7.0		5.0
Vaiden:						
VaB	450	40	40	4.5	6.5	
VaC				4.5	6.5	
VaD2				4.0	6.0	

[1] Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep or five goats) for a period of 30 days.

the woodlands of the county. Needle-leafed forest types occur most frequently on the hills, and broad-leafed types generally predominate on the bottoms along the rivers and creeks.

The value of the wood products is substantial, though it is below its potential. Other woodland values and benefits include grazing, wildlife, recreation, natural beauty, and conservation of soil and water. This section has been provided to explain how soils affect tree growth and management in the county.

Commercial forest

The forests of Jasper County were practically all removed by 1925. During the first 25 years of the twentieth century, neither individual nor local governments gave much thought to the forests, except to consider them a hindrance to farming. Since that time the development of forest-based industry, local markets for wood products, and the influence of agency and industry foresters in proper forest management have reversed this concept of forests.

Today Jasper County has 308,000 acres of forest land. Of this, 16,900 acres is national forest and 7,400 acres is in other public ownership; 65,300 acres is owned by the forest industry; 59,800 acres is owned by farmers; and 158,600 acres is owned by miscellaneous private individuals (*6*).

As of 1974, there were two sawmills, each with an annual output of less than 3 million board feet, operating in the county. There were also two minor sawmills producing hardwood products; one minor sawmill producing crossties; one miscellaneous plant producing handles and ski stock; and four pulp yards. Other industries and woodyards in adjacent counties also procure wood from Jasper County.

In 1972, 111,281 standard cords of round pulpwood

was produced, making Jasper County the fourth highest producing county in this category in the State. In 1972 Jasper County also produced 20.7 million board feet of sawlogs, mainly softwood; 16.6 million board feet of veneer logs; and small volumes of poles, piling, and posts (*3*).

Forest types

The forests in the county can be classified according to forest types. These forest types are stands of trees of the given species growing under the same ecological and biological conditions. Soils influence the stand density, species composition, and the rate of growth.

The major forest types that naturally occur in Jasper County are loblolly-shortleaf pine, 140,000 acres; oak-pine, 39,200 acres; oak-hickory, 89,600 acres; and oak-gum-cypress, 39,200 acres. These forest types are briefly discussed in the following paragraphs.

Loblolly-shortleaf pine.—This forest type is predominantly loblolly pine interspersed with shortleaf pine. These species make up approximately 80 percent of this forest type. They are commonly on uplands. The remaining species are upland hardwoods that are interspersed as single trees or as groups of hardwoods. The hardwoods include blackjack oak, post oak, southern red oak, sweetgum, sassafras, persimmon, and hickory.

Oak-pine.—This forest type generally occurs on two topographic positions, each with different soil conditions. The first position is along well drained to excessively drained soils on uplands. More than 50 percent of the forest type in this position is blackjack oak, post oak, and southern red oak, and the rest is shortleaf pine. The second position is along high stream terraces or second or third bottoms. About 50 percent of the species is water oak, shumard red oak, cherrybark oak, and cow oak, and the rest is loblolly pine. Other species are maple, ash sycamore, elm, beech, and sweetgum.

Oak-hickory.—This forest type is made up mainly of upland oaks and hickory in association with elm, maple, yellow-poplar, and other species.

Oak-gum-cypress.—This forest type is on bottom lands. Many species are included throughout this forest type. Species composition within this forest type is influenced by both soils and water. In the sloping areas where water runs off rapidly, species are cherrybark oak, cow oak, water oak, sweetgum, pine, and other species. The wet or level areas support mainly water oak, willow oak, sweetgum, and other species. The depressional areas support persimmon, water oak, overcup oak, blackgum, and other species. The old sloughs support tupelo-gum, cypress, and other species.

Woodland suitability groups

In table 3 woodland management concerns and potential productivity of the soils in Jasper County are listed.

In the table soils are listed by mapping unit symbols and the series to which they belong. If a mapping unit contains the name of two series, as in an association, the component soils are listed and evaluated separately under each series name.

Also given in the table is the woodland suitability group in which each soil has been placed (*8, 9*). Each group is made up of soils that are suited to the same kinds of trees, that need about the same kind of management to produce these trees, and that have about the same potential productivity.

Each woodland suitability group is identified by a three-part symbol. The first element of the symbol is an arabic numeral expressing site quality and indicating the relative productivity of the soils. The number 1 indicates very high; 2, high; 3, moderately high; 4, moderate; and 5, low. The second element of the symbol, a letter, indicates the important soil property that imposes a moderate or severe hazard or limitation in managing the soils for wood production. The letter *w* shows that excessive water in or on the soil is the chief limitation; *c* shows that clay in the upper part of the soil is a limitation; *s* shows the soils are sandy; and *o* shows the soils have no significant restrictions or limitations for woodland use or management. The third element in the symbol indicates the degree of management concern and the general suitability of the soils for certain kinds of trees.

The management concerns rated in the table are erosion hazard, equipment limitation, seedling mortality, and plant competition. Erosion hazard measures the risk of soil losses in well-managed woodland. Erosion hazard is *slight* if expected soil loss is small, *moderate* if some measures to control erosion are needed in logging and construction, and *severe* if intensive treatment or special equipment and methods are needed to prevent excessive soil losses.

Equipment limitation ratings reflect the soil conditions that restrict the use of equipment normally used in woodland management or harvesting. A rating of *slight* indicates equipment use is not limited to kind or time of year. A rating of *moderate* indicates a seasonal limitation or need for modification in methods or equipment. A rating of *severe* limitations indicates the need for specialized equipment or operations.

Seedling mortality ratings indicate the degree of expected mortality of planted seedlings when plant competition is not a limiting factor. Normal rainfall, good planting stock, and proper planting are assumed. A *slight* rating indicates expected mortality is less than 25 percent. A *moderate* rating indicates 25 to 50 percent loss; and a *severe* rating indicates more than 50 percent loss of seedlings.

Plant competition refers to the invasion or growth of undesirable woody or herbaceous species or heavy grass when openings are made in the crown cover by intermediate cuttings or harvest cuttings for regeneration of the stand. Competition is *slight* if it does not prevent adequate regeneration. It is *moderate* if it delays regeneration but does not prevent the eventual development of fully stocked stands. It is *severe* if it prevents adequate regeneration without intensive site preparation and maintenance.

Commercially important trees are the trees that woodland managers generally favor in intermediate or improvement cuttings. The potential productivity of these trees is given in terms of site index. The site index is the average height of dominant trees, in feet,

[3] ROBERT L. GRIGSBY, woodland conservationist, Soil Conservation Service, helped to prepare this section.

TABLE 3.—*Woodland management and productivity*

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry in a column means the information was not available]

Soil series and map symbols	Suitability group	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Important trees	Site index	
Adaton: Ad	2w9	Slight	Severe	Severe	Moderate	Water oak Loblolly pine Sweetgum	80 80 80	Shumard oak, loblolly pine, sweetgum.
Bassfield: BaB	2o7	Slight	Slight	Slight	Slight	Cherrybark oak Loblolly pine Shortleaf pine Sweetgum	90 90 80 90	Cherrybark oak, loblolly pine, sweetgum.
Bibb: Bb	2w9	Slight	Severe	Severe	Severe	Loblolly pine Sweetgum Water oak	90 90 90	Eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
Boswell: BoB, BoC	3c2	Slight	Moderate	Moderate	Slight	Loblolly pine Shortleaf pine	80 70	Loblolly pine, shortleaf pine.
Dorovan: Do	4w9	Slight	Severe	Severe		Blackgum Sweetbay	70 ---	Baldcypress.
Freest: FrA, FrB, FrC	2w8	Slight	Moderate	Slight	Moderate	Loblolly pine Shortleaf pine Slash pine	90 80 85	Loblolly pine, slash pine.
Heidel: HeD, HeE, HTF—For Troup part of HTF, see Troup series.	2o1	Slight	Slight	Slight	Slight	Loblolly pine Shortleaf pine Slash pine	90 72 90	Loblolly pine, slash pine.
Jena: Je	1o7	Slight	Slight	Slight	Moderate	Loblolly pine Sweetgum Water oak Southern red oak White oak Slash pine	100 90 80 --- --- ---	Loblolly pine, slash pine, American sycamore, eastern cottonwood.
Kirkville: Kk—For Mantachie part of Kk, see Mantachie series.	1w9	Slight	Moderate	Moderate	Moderate	Cherrybark oak Loblolly pine Sweetgum Water oak	100 95 100 100	Cherrybark oak, eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
KR—For Jena part of KR, see Jena series.	1w9	Slight	Severe	Severe	Moderate	Cherrybark oak Loblolly pine Sweetgum Water oak	100 95 100 100	Cherrybark oak, eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
Lakeland: LaD, LaE	4s3	Slight	Moderate	Moderate	Slight	Slash pine Loblolly pine Longleaf pine	75 75 60	Slash pine, loblolly pine.
Leeper: Le	1w6	Slight	Severe	Severe	Slight	Eastern cottonwood. Sweetgum Green ash American sycamore.	110 95 90 100	Eastern cottonwood, sweetgum, green ash, American sycamore.

TABLE 3.—*Woodland management and productivity*—Continued

Soil series and map symbols	Suitability group	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Important trees	Site index	
Louin: Lo	3c8	Slight	Moderate	Moderate	Severe	Loblolly pine Shortleaf pine Sweetgum	85 75 80	Loblolly pine, shortleaf pine.
Lucy	3s2	Slight	Moderate	Moderate	Slight	Slash pine Longleaf pine Loblolly pine	80 70 80	Slash pine, longleaf pine, loblolly pine.
Mantachie: Mantachie part of Kk	1w8	Slight	Severe	Moderate	Severe	Green ash Eastern cottonwood. Cherrybark oak Loblolly pine Sweetgum Yellow-poplar	80 90 100 98 95 95	Green ash, eastern cottonwood, cherrybark oak, loblolly pine, sweetgum, yellow-poplar.
MM For Mathiston part of MM, see Mathiston series.	1w9	Slight	Severe	Severe	Severe	Green ash Eastern cottonwood. Cherrybark oak Loblolly pine Sweetgum Yellow-poplar	80 90 100 98 95 95	Green ash, eastern cottonwood, cherrybark oak, loblolly pine, sweetgum, yellow-poplar.
Marietta: Mr	1w5	Slight	Moderate	Moderate	Slight	Eastern cottonwood. Green ash Sweetgum American sycamore. Yellow-poplar	105 90 100 105 100	Eastern cottonwood, sweetgum, yellow-poplar, green ash, American sycamore.
Mathiston	1w9	Slight	Severe	Moderate	Moderate	Cherrybark oak Green ash Loblolly pine Sweetgum	100 90 95 95	Cherrybark oak, green ash, loblolly pine, sweetgum, American sycamore.
McLaurin: MuB, MuC	3o1	Slight	Slight	Slight	Slight	Loblolly pine Shortleaf pine	83 70	Loblolly pine, shortleaf pine.
Okolona: OkB2	4c2	Slight	Moderate	Moderate	Slight	Eastern redcedar	40	Eastern redcedar.
Ora: OrB2, OrC2, OrD2	2o7	Slight	Slight	Slight	Moderate	Loblolly pine Longleaf pine Sweetgum	86 70 85	Loblolly pine, slash pine.
Prentiss: PrA, PrB	2o7	Slight	Slight	Slight	Slight	Loblolly pine Shortleaf pine Sweetgum Cherrybark oak White oak	88 79 90 90 80	Loblolly pine, slash pine.
Ruston: RuB, RuC	2o1	Slight	Slight	Slight	Moderate	Loblolly pine Slash pine Longleaf pine	91 91 76	Loblolly pine, slash pine, longleaf pine.
Savannah: SaA, SaB, SaC	2o7	Slight	Slight	Slight	Moderate	Loblolly pine Longleaf pine Slash pine Sweetgum	88 78 88 85	Loblolly pine, slash pine, sweetgum, American sycamore, yellow-poplar.

TABLE 3.—*Woodland management and productivity*—Continued

Soil series and map symbols	Suitability group	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Important trees	Site index	
Shubuta: SbB2, SbC	3c2	Slight	Moderate	Slight	Slight	Loblolly pine Shortleaf pine	80 70	Loblolly pine, shortleaf pine, slash pine.
Smithdale: SdD2, SdE, SEF—For Lucy part of SEF, see Lucy series.	2o1	Slight	Slight	Slight	Moderate	Loblolly pine Longleaf pine Slash pine	86 69 85	Loblolly pine, longleaf pine, slash pine.
Stough: Sf	2w8	Slight	Moderate	Slight	Moderate	Cherrybark oak Loblolly pine Slash pine Sweetgum Water oak	85 90 86 85 80	Loblolly pine, slash pine, sweetgum.
Sumter: SmC2, SmD2	4c2	Moderate	Moderate	Moderate	Slight	Eastern redcedar	40	Eastern redcedar.
Susquehanna: SnB, SnC2	3c2	Slight	Moderate	Slight	Moderate	Loblolly pine Shortleaf pine	78 68	Loblolly pine, shortleaf pine.
Sweatman: StD2, SwE2, SXE, SYE—For Smithdale part of SwE2 and SYE, see Smithdale series.	3c2	Slight	Moderate	Slight	Slight	Loblolly pine Shortleaf pine	83 73	Loblolly pine, shortleaf pine.
Troup: TrD	3s2	Slight	Moderate	Moderate	Slight	Loblolly pine Longleaf pine Slash pine	80 70 80	Loblolly pine, longleaf pine, slash pine.
Una: Un—For Urbo part of Un, see Urbo series.	2w6	Slight	Moderate	Severe	Moderate	Sweetgum Eastern cottonwood. Green ash Cherrybark oak Nuttall oak Water oak Willow oak Water tupelo	90 85 75 90 95 90 90 80	Sweetgum, green ash, Nuttall oak, water tupelo.
Urbo: UR	1w6	Slight	Severe	Moderate	Moderate	Green ash Eastern cottonwood. Cherrybark oak Sweetgum	93 100 99 98	Eastern cottonwood, loblolly pine, sweetgum, American sycamore, yellow-poplar.
Vaiden: VaB, VaC, VaD2	3c8	Slight	Moderate	Moderate	Severe	Loblolly pine Shortleaf pine Eastern redcedar Southern redcedar	76 68 45 70	Loblolly pine, eastern redcedar.

TABLE 4.—*Soil ratings for*

[See text for definitions of "good," "fair," "poor," and "very

Soil name and map symbol	Potential for habitat elements		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants
Adaton: Ad	Poor	Fair	Fair
Bassfield: BaB	Good	Good	Good
Bibb: Bb	Poor	Fair	Fair
Boswell:			
BoB	Fair	Fair	Good
BoC	Fair	Fair	Good
Dorovan: Do	Very poor	Very poor	Very poor
Freest:			
FrA	Good	Good	Good
FrB	Good	Good	Good
FrC	Fair	Good	Good
Heidel:			
HeD	Fair	Good	Good
HeE, HTF	Very poor	Very poor	Good
For Troup part of HTF, see Troup series.			
Jena: Je	Poor	Fair	Fair
Kirkville:			
Kk	Good	Good	Good
For Mantachie part of Kk, see Mantachie series.			
KR	Poor	Good	Good
For Jena part of KR, see Jena series.			
Lakeland: LaD, LaE	Poor	Fair	Fair
Leeper: Le	Good	Good	Fair
Louin: Lo	Fair	Good	Good
Lucy	Poor	Fair	Good
Mantachie:			
Mantachie part of Kk	Fair	Good	Good
MM	Poor	Fair	Fair
For Mathiston part of MM, see Mathiston series.			
Marietta: Mr	Good	Good	Good
Mathiston	Poor	Fair	Fair
McLaurin:			
MuB	Good	Good	Good
MuC	Fair	Good	Good
Okolona: OkB2	Good	Good	Fair
Ora:			
OrB2	Good	Good	Good
OrC2, OrD2	Fair	Good	Good
Prentiss: PrA, PrB	Fair	Good	Good
Ruston:			
RuB	Good	Good	Good
RuC	Fair	Good	Good
Savannah:			
SaA, SaB	Good	Good	Good
SaC	Fair	Good	Good

wildlife habitat

poor." Absence of an entry indicates the soil was not rated]

Potential for habitat elements—Continued			Potential as habitat for—		
Hardwood trees	Wetland plants	Shallow water areas	Open-land wildlife	Woodland wildlife	Wetland wildlife
Fair	Good	Good	Fair	Fair	Good.
Good	Very poor	Very poor	Good	Good	Very poor.
Fair	Good	Good	Fair	Fair	Good.
Good	Poor	Very poor	Fair	Good	Very poor.
Good	Very poor	Very poor	Fair	Good	Very poor.
Very poor	Good	Good	Very poor	Very poor	Good.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Very poor	Good	Good	Poor.
Good	Poor	Very poor	Good	Good	Poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Poor	Fair	Very poor.
Good	Poor	Poor	Fair	Good	Poor.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Poor	Fair	Good	Poor.
Poor	Very poor	Very poor	Fair	Fair	Very poor.
Good	Fair	Good	Good	Good	Fair.
Good	Fair	Fair	Good	Good	Fair.
Good	Very poor	Very poor	Fair	Good	Very poor.
Good	Fair	Fair	Good	Good	Fair.
Good	Fair	Fair	Fair	Good	Fair.
Good	Poor	Poor	Good	Good	Poor.
Good	Fair	Fair	Fair	Good	Fair.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Poor	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Poor	Good	Good	Poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Poor	Poor	Good	Good	Poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.

TABLE 4.—*Soil ratings for*

Soil name and map symbol	Potential for habitat elements		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants
Shubuta:			
SbB2	Good	Good	Good
SbC	Fair	Good	Good
Smithdale:			
SdD2	Poor	Fair	Good
SdE, SEF	Fair	Good	Good
For Lucy part of SEF, see Lucy series.			
Stough: Sf	Fair	Good	Good
Sumter:			
SmC2	Fair	Fair	Fair
SmD2	Fair	Fair	Fair
Susquehanna: SnB, SnC2	Fair	Good	Good
Sweatman:			
StD2	Fair	Good	Good
SwE2, SXE, SYE	Poor	Fair	Good
For Smithdale part of SwE2, and SYE, see Smithdale series, unit SdE.			
Troup: TrD	Poor	Fair	Fair
Una: Un	Poor	Fair	Fair
For Urbo part of Un, see Urbo series.			
Urbo: UR	Poor	Fair	Fair
Vaiden:			
VaB, VaC	Fair	Fair	Fair
VaD2	Fair	Fair	Fair

at age 30 for cottonwood; at age 35 for sycamore; at age 25 for planted pines; and at age 50 for all other species or types.

Finally, the table lists trees that are suitable to plant for commercial wood production.

Wildlife habitat[4]

Soils directly influence the kinds and amounts of vegetation and amounts of water available, and in this way they indirectly influence the kinds of wildlife that can live in an area. Soil properties that affect the growth of wildlife habitat are: thickness of soil useful to crops, surface texture, available water capacity to a depth of 40 inches, wetness, surface stoniness or rockiness, flood hazard, slope, and permeability of the soil to air and water.

In table 4 the soils of this survey area are rated for producing seven elements of wildlife habitat and for three groups, or kinds, of wildlife. The ratings indicate relative suitability for various elements. A rating of *good* means the element of wildlife habitat, and habitats generally, are easily created, improved, and maintained. Few or no limitations affect management in this category and satisfactory results are expected when the soil is used for the prescribed purpose.

A rating of *fair* means the element of wildlife habitat, and habitats generally, can be created, improved, or maintained in most places. For satisfactory results, however, moderate intensity of management and fairly frequent attention may be required.

A rating of *poor* means the element of wildlife habitat and limitations for the designated use are rather severe. Habitats can be created, improved, or maintained in most places, but management is difficult and requires intensive effort.

A rating of *very poor* means the elements of wildlife habitat are very severe and that unsatisfactory results are to be expected. It is either impossible or impractical to create, improve, or maintain habitats on soils in this category.

Each soil is rated in table 4 according to its suitability for producing various kinds of plants and other elements that make up wildlife habitats. The ratings take into account mainly the characteristics of the soils and closely related natural factors of the environment. They do not take into account climate, present use of soils, or present distribution of wildlife and people. For this reason, selection of a site for develop-

[4] EDWARD G. SULLIVAN, biologist, Soil Conservation Service, helped prepare this section.

wildlife habitat—Continued

Potential for habitat elements—Continued			Potential as habitat for—		
Hardwood trees	Wetland plants	Shallow water areas	Open-land wildlife	Woodland wildlife	Wetland wildlife
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Fair	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Fair	Fair	Good	Good	Fair.
Good	Poor	Very poor	Fair	Good	Very poor.
Good	Very poor	Very poor	Fair	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Fair	Good	Very poor.
Fair	Very poor	Very poor	Fair	Fair	Very poor.
Fair	Good	Good	Fair	Fair	Good.
Good	Fair	Fair	Fair	Fair	Fair.
Good	Poor	Poor	Fair	Good	Poor.
Good	Very poor	Very poor	Fair	Good	Very poor.

ment as a habitat for wildlife requires inspection at the site.

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

Grain and seed crops.—These crops are annual grain-producing plants, such as corn, sorghum, millet, and soybeans.

Grasses and legumes.—This group consists of domestic grasses and legumes that are established by planting. They provide food and cover for wildlife. Grasses include bahiagrass, ryegrass, and panicgrass; legumes include annual lespedeza, shrub lespedeza, and other clovers.

Wild herbaceous plants.—This group consists of native or introduced perennial grasses, forbs, and weeds that provide food and cover for upland wildlife. Typical plants are beggarweed, perennial lespedeza, wild bean, pokeweed, and paspalum.

Hardwood trees.—These plants are nonconiferous trees that produce wildlife food in the form of fruits, nuts, and buds. Such plants commonly grow in their natural environment, but they may be planted and developed through wildlife management programs. Typical trees in this category are oak, beech, cherry, dogwood, and maple.

Wetland plants.—In this group are annual and perennial herbaceous plants that grow wild on moist and wet sites. They furnish food and cover mostly for wetland wildlife. Typical examples of these plants are smartweed, wild millet, spikerush and other rushes, sedges, burreed, tearthumb, and aneilema. Submerged and floating aquatics are not included in this category.

Shallow water areas.—These areas are impoundments or excavations for controlling water, generally not more than 5 feet deep, to create habitats that are suitable for waterfowl. Some are designed to be drained, planted, and then flooded; others are permanent impoundments that grow submersed aquatics.

Table 4 also rates soils according to their suitability as habitat for the three kinds of wildlife in the county –open-land, woodland, and wetland wildlife. These ratings are related to ratings made for the elements of habitat. For example, soils rated very poor for shallow water developments are rated very poor for wetland wildlife.

The kinds of wildlife are briefly described in the following paragraphs.

Open-land wildlife consists of birds and mammals that normally live in meadows, pastures, and open areas where grasses, herbs, and shrubby plants grow. Quail, doves, meadowlarks, field sparrows, cottontail

rabbits, and foxes are typical examples of open-land wildlife.

Woodland wildlife consists of birds and mammals that normally live in wooded areas of hardwood trees. Woodcocks, thrushes, wild turkeys, vireos, deer, squirrels, and raccoons are typical examples of woodland wildlife.

Wetland wildlife consists of birds and mammals that normally live in wet areas, marshes, and swamps. Ducks, geese, rails, shore birds, herons, minks, and muskrats are typical examples of wetland wildlife.

Engineering uses of the soils [5]

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain size, plasticity, and soil reaction. Also important are depth to the water table, depth to bedrock, and soil slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who:

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built, for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 5, 6, 7, 8, 9, 10, 11, and 12, which show several estimated soil properties significant to engineering; interpretations for various engineering uses; and results of engineering laboratory tests on soil samples.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 5 through 12, and it also can be used to make other useful maps.

This information, however, does not eliminate need for further investigations at sites selected for engineering works, especially works that involve heavy loads or that require excavations to depths greater than those shown in the tables, generally depths greater than 6 feet. Also, inspection of sites, especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have different meanings in soil science than in engineering. The Glossary defines many of these terms as they are commonly used in soil science.

Engineering soil classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system used by the SCS engineers, Department of Defense, and others, and the AASHTO system adopted by the American Association of State Highway and Transportation Officials.

In the Unified system (*2*), soils are classified according to particle size distribution, plasticity, liquid limit, and organic matter content. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six 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, CL–ML.

The AASHTO system (*1*) is used to classify soils according to those properties that affect use in highway construction and maintenance. 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. In group A–1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A–7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A–1, A–2, and A–7 groups are divided as follows: A–1–a, A–1–b, A–2–4, A–2–5, A–2–6, A–2–7, A–7–5, and A–7–6. As additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 or more for the poorest. The AASHTO classification for tested soils, with group index numbers in parentheses, is shown in table 5; the estimated classification, without group index numbers, is given in table 6 for all soils mapped in the survey area.

Soil test data

Table 5 contains engineering test data for some of the major soil series in Jasper County. These tests were made to help evaluate the soils for engineering purposes. The engineering classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. The mechanical analyses were made by combined sieve and hydrometer methods.

Compaction (or moisture-density) data are important in earthwork. If a soil material is compacted at

[5] PETER FORSYTHE, engineer, Soil Conservation Service, helped prepare this section.

successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the *optimum moisture content* is reached. After that, density decreases with increase in moisture content. The highest dry density obtained in the compactive test is termed *maximum dry density.* As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

Tests to determine liquid limit and plastic limit measure the effect of water on the consistence of soil material, as explained in "Soil properties significant in engineering."

Soil properties significant in engineering

Several estimated soil properties significant in engineering are given in tables 6, 7, and 8. These estimates are made for the representative profiles of each kind of soil. Estimates are given for the whole soil or for layers sufficiently different to have significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other survey areas. Following are explanations of some of the columns in table 6.

Texture is described in table 6, in the standard terms used by the U.S. Department of Agriculture. These terms take into account the percentage of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added, as for example, "gravelly loamy sand." "Sand," "silt," "clay," and some of the other terms used in USDA textural classification are defined in the Glossary.

Unified and *AASHTO* classifications are estimated. For an explanation of these terms, see the section "Engineering soil classification systems." The columns headed "Percentage passing sieve" show estimated particle size distribution according to standard sieve sizes.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from a semisolid to a plastic state; and the liquid limit, from a plastic to a liquid state. 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 plastic.

Table 7 contains information on the estimated physical and chemical properties of the soil. Following are explanations of some of the terms used in that table.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 7 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants. Available water capacity is influenced greatly by soil texture, density, the content of salts, and the content of organic matter.

Soil reaction is the degree of acidity or alkalinity of a soil, expressed as pH. The pH values and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the change in the volume of soil material when the content of moisture changes. It is the extent to which the soil shrinks as it dries out or swells when it gets wet. This shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. A *high* shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Risk of corrosion, as used in table 7, pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil properties such as drainage, texture, total acidity, and electrical conductivity of the soil material. Corrosivity for concrete is influenced mainly by the content of sodium or magnesium sulfate, but also by soil texture and acidity. Installations of uncoated steel that intersect soil boundaries or soil horizons are more susceptible to corrosion than installations entirely in one kind of soil or in one soil horizon. A corrosivity rating of *low* means that there is a low probability of soil-induced corrosion damage. A rating of *high* means that there is a high probability of damage, so that protective measures for steel and more resistant concrete should be used to avoid or minimize damage.

Erosion factors are used in an equation that predicts the amount of erosion resulting from certain land treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to detachment and transport by rainfall. Soils having the highest numbers are the most erodible. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or wind, that permits a high level of crop productivity to be sustained economically and indefinitely.

Table 8 contains information on soil and water features: hydrologic groups, flooding, high water table, and bedrock. Following are explanations of these features and some of the terms used in the table.

Hydrologic groups are groups of soils that have similar runoff potential under similar storm and cover conditions. The soils have been placed in four classes, designated A, B, C, or D. Class A soils have the lowest potential for runoff and class D the highest. Dual class ratings indicate the hydrologic groups for artificially drained and undrained conditions of a soil, respectively.

Flooding is the temporary covering of soils by water from overflowing streams, runoff from adjacent slopes, and tides. It does not include standing water for short periods following rains, nor water that commonly

TABLE 5.—*Engineering*

[Tests performed by Mississippi State Highway Department in accordance with standard procedures of the

Soil series and location	Report number	Depth from surface	Moisture-density [1]		Mechanical analysis [2]		
			Maximum dry density	Optimum moisture content	Percentage passing sieve—		
					No. 10 (2.0 mm)	No. 40 (2.42 mm)	No. 200 (0.074 mm)
		In	*Pct*	*Lb per cu ft*			
Boswell fine sandy loam: NE¼NW¼, sec. 29, T. 3 N., R. 12 E. (Modal)	S14	5–12	98.4	23.0	100	98	83
	S15	18–23	101.0	21.0	100	97	82
	S16	52–70	106.7	17.8	100	94	67
Jena sandy loam: NE¼NW¼, sec. 20, T. 1 N., R. 13 E. (Modal)	S10	0–9	113.4	12.5	100	98	29
	S11	22–32	119.7	10.7	100	100	51
	S12	32–47	117.7	11.7	100	100	45
	S13	47–70	117.5	11.1	100	100	43
McLaurin loamy sand: SW¼SE¼, sec. 10, T. 3 N., R. 12 E. (Modal)	S7	3–10	116.4	9.4	100	97	23
	S8	19–38	123.4	10.7	100	98	37
	S9	47–65	120.6	11.2	100	98	30

[1] Based on AASHTO Designation T99–57, Method A (*1*).

[2] Mechanical analysis according to AASHTO Designation: T 88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all material, including

covers swamps and marshes. Flooding is estimated in terms of frequency, duration, and probable time of occurrence. Terms for frequency of flooding are *none,* which means that flooding is not reasonably possible; *rare,* flooding is unlikely but is possible under unusual weather conditions; and *common,* flooding is likely under usual weather conditions. Common flooding may be further described as *occasional,* an average of once in 2 years or less, or *frequent,* more often than an average of once in 2 years. Duration of flooding is expressed as *very brief,* less than 2 days; *brief,* 2 to 7 days; and *long,* 7 days or longer. Time of flooding is expressed by the months when flooding normally happens.

Information on *high water table* gives the distance from the surface of the soil to the highest level that ground water reaches for significant periods during most years. The kind of high water table, apparent or perched, and the months when the water table is highest are also given. *Apparent* water table represents that level at which water stands in an uncased borehole after adequate time for adjustment in the surrounding soil. A *perched* water table is a water table that stands above an unsaturated zone in the soil.

Depth to bedrock is the distance from the surface of the soil to the upper surface of the rock layer. The hardness of the bedrock affects the ease of excavation. *Rippable* rock means that it is estimated that rock can be excavated using a single tooth ripping attachment mounted on a 200 to 300 horsepower tractor. It is estimated that *hard* rock requires blasting or use of excavators larger than 200- to 300-horsepower tractor.

Sanitary facilities

Septic tank absorption fields, sewage lagoons, and sanitary landfills are highly dependent upon favorable soil properties for proper function. The nature of the soil is thus important in the choice of sites for these facilities and in the identification of limiting soil properties that need to be considered in their design and installation. Also, those soil properties that affect the ease of excavation or installation of these facilities will be of interest to contractors and local officials. In table 9, the degree and kind of soil limitations of each soil for these uses, and for use of the soil as daily cover for landfills, are presented.

The degree of soil limitation is indicated by the ratings slight, moderate, or severe. These ratings and their respective meanings apply to table 9, also to tables 10, 11 and 12. A rating of *slight* means that the soil properties are generally favorable for the specified use and that limitations are minor and are easily overcome. A rating of *moderate* means that the soil properties are unfavorable for the specified use but can be overcome or modified by special planning and design. A rating of *severe* indicates that soil properties are so unfavorable or difficult to correct or overcome that major soil reclamation, special designs, or intensive maintenance are required.

Soil suitability is rated by the terms *good, fair,* and *poor,* which have, respectively, meanings approximately parallel to the terms for limitations of slight, moderate, and severe. In addition, the term *unsuited* is used for soils that have no potential as source of sand and gravel.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Soil horizons between depths of 12 and 72 inches are evaluated for this use. The soil properties considered include those

test data

American Association of State Highway and Transportation Officials (AASHTO)]

Mechanical analysis—Continued				Liquid limit	Plasticity index	Classification	
Percentage smaller than—							
0.05 mm	0.02 mm	0.005 mm	0.002 mm			AASHTO	Unified
				Pct			
76	67	52	47	60	31	A–7(29)	CH
74	64	45	41	57	31	A–7(28)	CH
58	49	40	35	47	25	A–7(15)	CL
25	15	5	3	----------	[1] NP	A–2(0)	SM
40	27	14	11	----------	NP	A–4(0)	ML
30	19	11	10	----------	NP	A–4(0)	SM
28	20	11	9	----------	NP	A–4(0)	SM
23	14	6	3	----------	NP	A–2(0)	SM
37	27	16	14	----------	NP	A–4(0)	SM
28	25	18	7	----------	NP	A–2(0)	SM

that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

[1] NP = Nonplastic

that affect the absorption of the effluent and those that affect the construction of the system.

Properties or features that affect the absorption of the effluent include permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Large rocks or boulders and shallow depths to bedrock interfere with installation. Excessive slope is also a limitation that can result in lateral seepage and surfacing of the effluent in areas downslope. Also there is a hazard of soil erosion where absorption fields are installed on sloping soils.

Some soils underlain by loose sand and gravel or creviced bedrock at a depth of less than 4 feet below the tile lines of the absorption field do not adequately filter the effluent. As a result, ground water supplies in the area may be contaminated. Those soils in which such inadequate filtration is a hazard are indicated by a footnote in table 9.

Where percolation tests are performed to determine the absorptive capacity of the soil and its suitability for septic tank absorption fields, it is desirable to perform these tests during the season when the water table is at its highest level and, thus, when the soil has its minimum absorptive capacity.

It may be feasible, on many of the soils that have moderate or severe limitations for septic tank absorption fields, to install special systems that lower the seasonal water table or to increase the size of the absorption fields so that satisfactory performance is realized.

Sewage lagoons are shallow ponds constructed to hold sewage while bacteria decompose the solid and liquid wastes (fig. 6). A lagoon has a nearly level floor surrounded by cut slopes or embankments of compacted soil material. Lagoons generally are designed so that the depth of the sewage is 2 to 5 feet. Soil requirements for the lagoon floor include relatively impervious soil at least 4 feet thick to minimize seepage and contamination of local ground water. Soils very high in organic matter content are undesirable as are soils that have large rock and boulders. Contamination of local ground water is also a hazard where the seasonal high water table is at a depth of less than that of the lagoon floor, except in soils that have very slow permeability. Seepage of soil water into the lagoon may seriously reduce its capacity to receive liquid waste in some soils that have a high seasonal water table. Slope, depth to bedrock, and susceptibility to flooding also affect the desirability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soils influence the performance of embankments.

Sanitary landfill is a method of disposing of refuse, either in dug trenches or on the surface of the soil. The waste is spread in thin layers, compacted, and covered with soil. Landfill areas are subject to heavy vehicular traffic. Soil properties that influence ease of excavation, the hazard of polluting ground water, and trafficability affect the suitability for landfill sites. The best soils have loamy or silty textures and moderate or slow permeability, are deep to bedrock and a seasonal water table, are free of stones, and are not subject to flooding. Where the seasonal water table is high, water seeps into the trenches and hinders excavation and filling of the trenches. Also, seepage of water into the refuse increases the hazard of pollution of ground water. Clayey soils are sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might cause noxious liquids to contaminate local ground water.

Figure 6.—Sewage lagoon on Boswell fine sandy loam, 2 to 5 percent slopes.

Unless otherwise stated, the ratings in table 9 apply only to a depth of about 6 feet. Ratings of slight or moderate limitation may not be valid if the required depth of trenches is much deeper than that. Onsite soil investigations commonly should be performed before site selection.

In the area type of sanitary landfill, refuse is placed on the surface of the soil in successive layers. The limitations because of soil texture, depth to bedrock, and stone content do not apply to this type of landfill. Soil wetness is a limitation because of difficulty in the operation of equipment as the lowest layers of refuse are placed on the site.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10. The texture, thickness, and organic matter content of each soil horizon are important factors in the classification of soils in this soil survey. Therefore, the potential of each soil for soil materials used in construction has been determined to the depth normally observed and described as the survey was made. This depth is commonly about 6 feet. The ratings of suitability for these uses are explained in the section "Sanitary facilities."

Roadfill is soil material used in embankments for roads. The ratings reflect the relative ease of excavating and working the material, and the predicted performance of the material after it has been compacted and provided with adequate drainage. The performance of the soil after stabilizing with lime or cement is not considered in the ratings; however, the descriptions of the soil series provide information about most of the soil properties that determine such performance.

The ratings are given for the entire soil profile between the A horizon and a depth of 5 or 6 feet, assuming that soil horizons will be mixed during excavation and spreading. For many soils there are horizons of contrasting suitability within the profile. Reference to the estimated engineering properties in

table 6 will provide more specific information about the nature of each horizon and its suitability for roadfill.

Soils rated good are in the GW, GP, SW, or SP Unified classes or the GC, SC, or SM classes and have less than 30 percent silt and clay. In addition, they have low shrink-swell potential and low content of larger stones. The soils are at least moderately well drained and have slopes of 15 percent or less. Soils rated fair are in the ML or CL Unified classes and have a plasticity index of less than 15 percent, or have other limiting features such as shrink-swell potential, potential frost action, slope, wetness, or stoniness.

Where the thickness of suitable material is less than about 3 feet because of underlying bedrock or poorly suited material, the whole soil is given a rating of poor, regardless of the quality of the suitable material.

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 10 provide guidance about where to look for probable sources. They are based on the probability that soils contain sizable quantities of sand or gravel. A soil rated good or fair has a layer at least 3 feet thick, the top of which is within a depth of 6 feet, of suitable material. For sources of sand, this material is in the SW or SP Unified classes; for sources of gravel it is in the GW or GP classes. Soil material rated fair is in the SW–SM, SP–SM, GW–GM, or GP–GM Unified classes; soil material rated poor is in the SM, SW–SC, SP–SC, GM, GW–GC, or GP–GC Unified classes. Soft materials, such as shale and siltstone are not considered sand and gravel in these ratings.

The ratings do not take into account the location of the water table or other factors that affect mining of the materials. Further description of the materials in terms of grain sizes, kinds of minerals, reaction, and stratification is given in the soil series descriptions and in table 6.

Topsoil is used for topdressing on areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material for preparing a seedbed and the ability of the soil material to sustain the growth of plants. Also considered is the damage that would result in the area from which the topsoil is taken. Soils rated good have fair to good natural drainage and at least 16 inches of friable loamy material in the surface layer. They are free of large stones, are low in content of gravel and other coarse fragments, and have gentle slopes. They are low in soluble salts that might limit plant growth. They are naturally fertile or respond well to fertilization.

Although high content of organic matter is not required for a rating of good, surface horizons are much preferred for topsoil because of their natural organic matter content. These horizons are designated as A1 horizons in the soil series descriptions. The absorption and retention of moisture for plant growth is greatly increased by the presence of organic matter, and thus the careful preservation and use of material from these horizons is highly desirable.

Building site development

The properties of each of the soils as they affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 11. The degrees of limitations of soil properties that affect these uses are explained in the section "Sanitary facilities."

Shallow excavations include digging or trenching for pipelines, sewerlines, telephone and power transmission lines, basements, open ditches, and cemeteries. Such excavations are influenced by soil wetness or a high seasonal water table, the texture and stickiness of soils, the tendency of soils to cave-in or slough, and the presence of very firm, compact layers, bedrock, or large stones. In addition, the soil survey indicates the slope of the soil and the probability of flooding which in many cases are important in excavation. Unless the soils are described to greater depths or unless otherwise noted, the soil ratings do not apply to soil horizons below a depth of 6 feet.

In the soil series descriptions, the relative firmness of each soil horizon is discussed, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and small commercial buildings, as defined for making the ratings in table 11, are structures not more than three stories high built on undisturbed soil. Small commercial buildings without basements were rated. Separate ratings are made for dwellings with and without basements. For these structures, soils should be sufficiently stable so that cracking or failure of the foundation will not occur. The needed stability is determined by the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity, and density are important properties related to stability. In addition, soil wetness and depth to seasonal high water table influence soil stability. Soil wetness features also indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, or the presence of large stones are also important considerations in the choice of sites for these structures and were considered as the ratings were made. Flooding hazard was considered to be a serious site limitation.

Local roads and streets, as defined for making the ratings in table 11, have an all-weather surface expected to carry traffic all year. They have subgrade of the underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime and cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly with soil at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and stability of the soil and the quantity and workability of fill material available are important items in the design and construction of roads and streets. The AASHTO and Unified classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity. Soil wetness and flooding also influence the stability of the material. Slope, depth to hard rock or very compact layers, content of large stones, and wetness affect the ease of excavation and grading. These qualities of the soil were estimated from the soil survey and used in making the ratings.

TABLE 6.—*Estimated engineering*

[An asterisk in the first column indicates that at least one mapping unit is made up of two or more kinds of soil. The soils in structions for referring to other series as indicated. The symbol < means

Soil series and map symbols	Depth from surface	USDA texture	Classification	
			Unified	AASHTO
	In			
Adaton: Ad.	0–9	Silt loam	ML, CL, CL–ML	A–4
	9–85	Silt loam, silty clay loam, silty clay	CL, CH	A–6, A–7
Bassfield: BaB.	0–8	Fine sandy loam	SM	A–2, A–4
	8–45	Sandy loam, loam	SM	A–2, A–4
	45–80	Loamy sand, sand	SP–SM, SM	A–2, A–3
Bibb: Bb.	0–9	Fine sandy loam	SM, SM–SC, ML, CL–ML	A–2, A–4
	9–60	Sandy loam, loam, silt loam	SM, SM–SC, ML, CL–ML	A–2, A–4
Boswell: BoB, BoC.	0–5	Fine sandy loam	SM, ML	A–4
	5–70	Clay, silty clay, silty clay loam	CH	A–7
Dorovan: Do.	0–85	Muck	Pt	
	85–95	Sand, loamy sand	SP–SM	A–1, A–3
Freest: FrA, FrB, FrC.	0–6	Fine sandy loam	SM, SC, SM–SC, CL, ML, CL–ML	A–4
	6–15	Loam, sandy clay loam	CL	A–4, A–6
	15–80	Clay loam, clay, silty clay	CL, CH	A–7
*Heidel: HeD, HeE, HTF. For Troup part of HTF, see Troup series.	0–11	Sandy loam	SM	A–4
	11–80	Fine sandy loam, sandy loam, loam	CL–ML, CL, SC, SM–SC	A–4
Jena: Je.	0–9	Sandy loam, fine sandy loam	SM, ML, CL–ML, SM–SC	A–4, A–2–4
	9–70	Silt loam, sandy loam, fine sandy loam	SM, ML, CL–ML, SM–SC	A–4, A–2–4
*Kirkville: Kk, KR. For Mantachie part of Kk and Jena part of KR, see respective series.	0–10	Fine sandy loam, sandy loam, loam	SM, SM–SC, ML, CL–ML	A–2, A–4
	10–70	Loam, sandy loam, fine sandy loam	ML, SM, CL–ML, SM–SC	A–2, A–4
Lakeland: LaD, LaE.	0–42	Sand	SP–SM	A–3, A–2–4
	42–78	Sand, fine sand	SP, SP–SM	A–3, A–2–4
Leeper: Le.	0–5	Silty clay	CH, CL	A–7
	5–55	Clay, silty clay, silty clay loam	CH	A–7
Louin: Lo.	0–2	Silty clay loam	CL	A–6, A–7
	2–60	Silty clay, clay	CH	A–7
	60–90	Silty clay, clay	CH	A–7
Lucy.	0–27	Loamy sand	SM, SP–SM	A–2
	27–65	Sandy loam, sandy clay loam, clay loam	SC, SM–SC	A–2, A–6, A–4
*Mantachie: MM. For Mathiston part of MM, see Mathiston series.	0–6	Loam	CL–ML, ML, SM, SM–SC	A–4
	6–55	Loam, clay loam, sandy clay loam	ML, CL, SC, SM, CL–ML, SM–SC	A–4, A–6
Marietta: Mr.	0–6	Silt loam	ML, CL	A–4
	6–46	Silty clay loam, sandy clay loam, loam	CL, SC	A–6, A–4
	46–65	Silty clay loam, sandy clay loam	CL, CH, SC	A–7, A–6
Mathiston.	0–9	Silt loam	CL, CL–ML	A–4, A–6
	9–55	Silty clay loam, loam, silt loam	CL	A–6, A–7
McLaurin: MuB, MuC.	0–10	Loamy sand	SM	A–2
	10–47	Sandy loam, loam	SM, SC, SM–SC	A–4
	47–80	Sandy loam, loam, sandy clay loam	SM, SC, SM–SC	A–4, A–6, A–2

properties and classifications

such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the in-
less than. Absence of an entry means data were not estimated]

Fragments greater than 3 inches	Percentage passing sieve—				Liquid limit	Plasticity index
	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)		
Pct					*Pct*	
0	100	100	90–100	85–100	<30	[1] NP–10
0	100	100	95–100	85–100	30–52	11–39
0	90–100	85–100	55–70	25–40	<20	NP–3
0	90–100	85–100	60–70	30–40	<20	NP–3
0	90–100	85–100	65–85	5–20	<20	NP–3
0–5	95–100	90–100	60–90	30–60	<30	NP–7
0–10	60–100	50–100	40–100	30–90	<30	NP–7
0	100	100	60–85	40–55	----------	NP
0	100	100	90–100	67–95	47–70	25–40
0						
0	100	100	5–70	5–10	----------	NP
0	100	95–100	60–90	40–70	<30	NP–8
0	100	95–100	80–95	55–75	25–40	7–20
0	100	95–100	90–100	80–95	40–55	20–30
0	90–100	85–100	70–85	36–45	<30	NP–4
0	90–100	85–100	60–85	36–55	15–25	4–10
0	100	100	60–98	29–75	<22	NP–4
0	100	100	55–100	25–70	<22	NP–4
0	100	100	60–100	30–70	<20	NP–5
0	100	100	90–100	30–65	<20	NP–5
0	90–100	90–100	60–100	5–12	----------	NP
0	90–100	90–100	50–100	1–12	----------	NP
0	100	100	90–100	80–95	45–70	25–45
0	100	100	95–100	80–97	52–75	30–50
0	100	100	90–100	70–95	30–48	15–28
0	100	100	90–100	85–95	55–75	32–50
0	100	100	90–100	85–95	55–75	32–50
0	100	95–100	60–80	10–30	----------	NP
0	100	95–100	60–95	20–50	20–40	5–20
0–5	95–100	90–100	60–85	40–60	<20	NP–5
0–5	95–100	90–100	80–95	45–80	20–40	5–15
0	100	100	90–100	65–90	20–30	5–10
0	100	100	85–100	45–90	25–40	8–20
0	100	100	85–100	45–90	35–55	15–30
0	100	100	85–100	60–95	25–35	7–15
0	100	100	85–100	70–90	30–45	15–25
0	95–100	90–100	50–97	15–30	----------	NP
0	95–100	90–100	85–100	36–45	<30	NP–10
0	95–100	90–100	70–100	30–50	<40	NP–15

TABLE 6.—*Estimated engineering*

Soil series and map symbols	Depth from surface	USDA texture	Classification	
			Unified	AASHTO
	In			
Okolona: OkB2.	0–16	Clay	CL, CH	A–7
	16–55	Silty clay, clay	CH	A–7
	55–105	Weathered bedrock.		
Ora: OrB2, OrC2, OrD2.	0–5	Fine sandy loam	SM–SC, SM, ML, CL–ML	A–4, A–2
	5–28	Clay loam, sandy clay loam, loam	CL, ML	A–6, A–4, A–7
	28–55	Sandy clay loam, loam, sandy loam	CL, ML	A–6, A–7, A–4
	55–70	Sandy clay loam, loam, sandy loam	CL	A–4, A–6, A–7
Prentiss: PrA, PrB.	0–12	Fine sandy loam	ML, CL–ML, SM, CL, SC, SM–SC	A–4
	12–25	Loam, sandy loam, fine sandy loam	CL, ML, SC, SM	A–6, A–4
	25–60	Fine sandy loam, loam	ML, CL–ML, SM, SC	A–4, A–6
Ruston: RuB, RuC.	0–12	Fine sandy loam	SM, ML	A–4, A–2–4
	12–26	Sandy clay loam, loam, clay loam	SC, CL	A–6
	26–43	Fine sandy loam, sandy loam	SM, ML, CL–ML, SM–SC	A–4, A–2–4
	43–70	Sandy clay loam, loam, clay loam	SC, CL	A–6
Savannah: SaA, SaB, SaC.	0–6	Fine sandy loam	SM, ML	A–2–4, A–4
	6–30	Sandy clay loam, clay loam, loam	CL, SC, CL–ML	A–4, A–6
	30–65	Loam, clay loam, sandy clay loam	CL, SC, CL–ML	A–4, A–6, A–7
Shubuta: SbB2, SbC.	0–8	Fine sandy loam, sandy loam, loam	SM, SM–SC, ML, SC, ML–CL, CL	A–2, A–4
	8–52	Clay, sandy clay, clay loam	CH, MH, CL	A–7
	52–70	Clay, sandy clay, sandy clay loam	CH, CL, SC	A–6, A–7
*Smithdale: SdD2, SdE, SEF. For Lucy part of SEF see Lucy series.	0–10	Fine sandy loam	SM, SM–SC	A–4
	10–35	Clay loam, sandy clay loam, loam	SM–SC, SC, CL, CL–ML	A–6, A–4
	35–80	Loam, sandy loam	SM, ML, CL, SC, CL–ML, SM–SC.	A–4
Stough: Sf.	0–16	Fine sandy loam	SM–SC, SM, ML, CL–ML	A–4
	16–39	Loam, fine sandy loam	ML, CL, CL–ML	A–4
	39–70	Sandy loam, sandy clay loam, loam	SM, SC, CL, ML	A–4, A–6
Sumter: SmC2, SmD2.	0–5	Clay	CL, ML	A–7
	5–35	Silty clay, clay, silty clay loam	CH, CL	A–7
	35–60	Weathered bedrock	CH, CL	A–7
Susquehanna: SnB, SnC2.	0–7	Fine sandy loam	ML, SM	A–4
	7–70	Clay, silty clay loam, silty clay	CH	A–7
*Sweatman: StD2, SwE2, SXE, SYE. For Smithdale parts of SwE2 and SYE, see Smithdale series.	0–5	Fine sandy loam	CL–ML, CL, ML	A–4
	5–42	Clay, silty clay, silty clay loam	MH	A–7
	42–70	Stratified, weathered bedrock, fine sandy loam.	ML, MH	A–7
Troup: TrD.	0–7	Loamy sand	SM	A–2
	7–59	Loamy sand	SM	A–2
	59–88	Sandy clay loam, sandy loam	SC, SM–SC, CL–ML, CL	A–4
*Una: Un. For Urbo part of Un, see Urbo series.	0–4	Silty clay loam	CH, CL, MH	A–7
	4–65	Clay, silty clay loam, silty clay	CH, CL, MH	A–7

properties and classifications—Continued

Fragments greater than 3 inches	Percentage passing sieve—				Liquid limit	Plasticity index
	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)		
Pct					*Pct*	
0	100	100	95–100	85–95	46–55	25–32
0	95–100	95–100	95–100	90–95	60–90	36–65
0	100	95–100	65–85	30–65	<30	NP–5
0	100	95–100	80–100	50–80	25–48	8–22
0	100	95–100	80–100	50–75	25–43	8–25
0	100	95–100	80–98	50–60	30–49	11–30
0	100	100	65–100	36–75	<30	NP–10
0	100	100	70–100	40–75	20–35	4–12
0	100	100	70–100	40–75	20–35	4–12
0	85–100	78–100	65–100	30–75	<20	NP–3
0	85–100	78–100	70–100	36–75	30–40	11–18
0	85–100	78–100	65–100	30–75	<27	NP–7
0	85–100	78–100	70–100	36–75	30–40	11–18
0	100	100	60–85	30–55	<25	NP–4
0	100	100	80–100	40–80	23–40	7–19
0	100	100	80–100	40–80	23–43	7–19
0	95–100	95–100	70–95	30–75	<30	NP–10
0	95–100	95–100	95–100	45–90	41–70	18–40
0	95–100	95–100	80–100	40–80	35–60	15–40
0	100	85–100	60–80	36–49	<20	NP–5
0	100	85–100	80–95	45–75	23–38	7–15
0	100	85–100	65–80	36–70	<30	NP–10
0	100	100	65–95	36–65	<25	NP–7
0	100	100	75–95	50–75	<25	NP–8
0	100	100	65–90	40–65	25–40	8–15
0	99–100	99–100	98–100	85–90	41–50	16–25
0	100	99–100	99–100	90–95	41–55	16–32
0	100	100	99–100	75–90	41–60	16–34
0	100	100	65–90	40–55	----------	NP
0	100	100	88–100	80–98	50–90	28–56
0	100	100	90–100	55–90	<35	NP–10
0	95–100	95–100	95–100	90–95	60–80	25–40
0	95–100	75–100	60–95	55–95	41–65	12–30
0	100	100	50–80	15–35	----------	NP
0	100	100	50–75	15–30	----------	NP
0	95–100	95–100	80–90	36–55	20–30	4–10
0	100	100	90–100	75–95	41–65	20–40
0	100	100	90–100	75–95	41–65	20–40

TABLE 6.—*Estimated engineering*

Soil series and map symbols	Depth from surface	USDA texture	Classification	
			Unified	AASHTO
	In			
Urbo: UR.	0–6	Silty clay loam	CL	A–6
	6–65	Silty clay loam, silty clay	CL, CH	A–7
Vaiden: VaB, VaC, VaD2.	0–2	Silty clay loam	MH, CH	A–7
	2–30	Clay	CH	A–7
	30–68	Clay	CH	A–7

[1] NP means nonplastic.

Water management

Table 12 contains ratings of the limitation of soils for ponds and soil features that affect the rating. The degrees of limitations of soil properties that affect these uses are explained in the section, "Sanitary facilities."

The table also lists the soil features significant to planning, installing, and maintaining other water control measures. Following are explanations of the interpretations given in the table.

Pond reservoirs are areas of water held behind a dam or embankment. Soils suitable for use as pond reservoir areas have low seepage, which is related to their permeability and depth over fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage and piping and that has favorable stability, shrink-swell potential, shear strength, and compactibility. The presence of stones or organic matter in a soil are unfavorable factors in the suitability of a soil for use in embankments, dikes, and levees.

An *aquifer-fed excavated pond* is a body of water created by excavating a pit or dugout into a groundwater aquifer. Excluded are ponds that are fed by runoff and embankment ponds that impound water to a depth of more than 3 feet. The suitability ratings are for properly designed, located, and constructed ponds that impound good-quality water. Properties affecting aquifer-fed ponds are a permanent water table, the permeability of the aquifer, and characteristics that interfere with excavation.

Drainage of cropland and pasture is affected by such soil properties as permeability; texture; structure; depth over claypan or other layers that influence rate of water movement; depth of the water table; slope; stability of ditchbanks; susceptibility to stream overflow; salinity and alkalinity; and availability of outlets for drainage.

Terraces and diversions are embankments, or ridges, constructed across a slope to intercept runoff and allow it to soak into the soil or flow slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth over unfavorable material; permeability; and resistance to water erosion, soil slipping, and soil blowing. A suitable soil provides outlets for runoff and is not difficult to vegetate.

Grassed waterways are used to carry runoff water safely to outlets. The features that affect the use of soils for waterways are permeability, erodibility, and suitability for permanent vegetation.

Recreation

Knowledge of soils is necessary in planning, developing, and maintaining areas used for recreation. In table 13 the soils of Jasper County are rated according to limitations that affect their suitability for camp areas, picnic areas, playgrounds, and paths and trails. The limitations are determined by the kind and degree of restrictive soil features, such as flooding, texture of the topsoil, and wetness. Suitability of soils for growing and maintaining plants is not a part of these ratings. It is, however, important in evaluating a site. Likewise, esthetic values, water supply, sewage disposal, and the size and shape of soil areas are not considered in the ratings. Soils subject to flooding vary in degree of limitations for recreational use, depending on the duration of the flooding, as well as on the season.

Additional interpretive information useful in planning and developing recreational facilities is shown in other tables throughout the section, "Engineering Uses of the Soils." Especially helpful are interpretations for septic tank absorption fields in table 9 and for dwellings without basements and local roads and streets in table 11.

The soils are rated as having slight, moderate, or severe limitations for specified uses. A limitation of *slight* means that soil properties are generally favorable and limitations are so minor that they can easily be overcome. A *moderate* limitation can be overcome or modified by plans, designs, or special maintenance. A *severe* limitation means that costly soil reclamation, special design, intensive maintenance, or a combination of these, is required.

Camp areas are used intensively as sites for tents and camp trailers and for the accompanying activities of outdoor living. Little preparation of the site is re-

properties and classifications—Continued

Fragments greater than 3 inches	Percentage passing sieve—				Liquid limit	Plasticity index
	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)		
Pct					*Pct*	
0	100	100	95–100	95–100	30–40	15–25
0	100	100	95–100	80–98	44–62	20–36
0	100	100	95–100	70–90	50–60	20–30
0	100	100	95–100	85–95	50–70	30–45
0	100	100	95–100	85–95	50–70	30–45

quired, other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils are gently sloping, are well drained, are free of rock and coarse fragments on the surface, are not subject to flooding during the season of use, have a surface that is firm after rains and not dusty when dry, and have a rapid percolation rate.

Picnic areas are attractive natural, or landscaped, tracts used mainly for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet and not dusty when dry, are not subject to flooding during the season of heavy use, and do not have slopes and stones that greatly increase the cost of leveling sites or of building access roads.

Playgrounds are areas used intensively for baseball, football, badminton, and other outdoor games. Soils suitable for this use should be able to withstand intensive foot traffic. The best soils have a nearly level surface free of coarse fragments and rock outcrops on the surface, are well drained, are not subject to flooding during seasons of heavy use, are firm after rains, and are not dusty when dry. If grading and leveling are required, the depth over rock is an important consideration.

Paths and trails are used for local and cross-country travel on bicycles, motorbikes, foot, or horseback. The design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet, are not dusty when dry, are not subject to flooding more than once during the season of heavy use, and have slopes of less than 15 percent.

Formation, morphology, and classification of the soils

This section describes the factors of soil formation and the processes of horizon differentiation as they apply to the soils in Jasper County. It also describes the system of classifying soils and places the soils of the county in categories of that system.

Factors of soil formation

Soil is the product of the interaction of the five major factors of soil formation. These factors are living organisms, climate, parent material, relief, and time (*11*).

Living organisms

Plants, earthworms, animals, insects, and other forms of life that live on and in the soil have an active part in soil-forming processes. The plants and animals play an extremely important part in the formation of soils. Some plants and animals tend to encourage the growth of some plants, but they tend to destroy other plants. Animals burrow beneath the surface and mix the soil.

The soils of Jasper County formed under grasses and forest. Early settlers found dense stands of pine and mixed hardwoods with an understory of vines and native shrubs on most of the area. In the northern part of the county, some of the soils of blackland prairie had stands of tall native grasses. The stream bottoms had native vegetation, ranging from freshwater swamp to thick stands of hardwood and pine trees, and a heavy understory of vines and canes.

Most of the living organisms in the soils of this county are plants, but there are also small animals. The plants include algae, fungi, bacteria, the roots of higher plants, and others. The existence of these organisms depends mainly on the soil condition and the food supply.

The most intensive activity of earthworms and crawfish is within the uppermost few inches of the soil. When animals and plants die, their bodies return to the soil and decay to form humus.

The complex of living organisms affecting soil formation in Jasper County has been drastically changed by man's activities. The introduction of new plant species and the drainage of wet areas will affect the direction and the rate of soil formation in the future.

Climate

Jasper County has a typical humid temperate climate that is characteristic of the southeastern United States. The summers are hot, and the winters are mild. The average temperature is about 66° F. Rainfall averages

TABLE 7.—*Estimated physical and chemical properties*

[An asterisk in the first column indicates that at least one mapping unit is made of two or more kinds of soil. The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series as indicated. Dashes indicate data were not available. The symbol < means less than; > means greater than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not estimated]

Soil series and map symbols	Depth from surface	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	*In/hr*	*In/in of soil*	*pH*					
Adaton: Ad.	0–9	0.6–2.0	0.20–0.22	4.5–5.5	Low	High	High	0.43	5
	9–85	0.06–0.2	0.18–0.22	4.5–5.5	Moderate	High	High	0.37	
Bassfield: BaB.	0–8	2.0–6.0	0.10–0.15	4.5–5.5	Low	Low	Moderate	0.20	4
	8–45	2.0–6.0	0.10–0.15	4.5–5.5	Low	Low	Moderate	0.20	
	45–80	6.0–20	0.05–0.08	4.5–5.5	Very low	Low	Moderate	0.20	
Bibb: Bb.	0–9	0.6–2.0	0.12–0.18	4.5–5.5	Low	High	Moderate		
	9–60	0.6–2.0	0.12–0.20	4.5–5.5	Low	High	Moderate		
Boswell: BoB, BoC.	0–5	0.6–2.0	0.15–0.20	4.5–5.5	Low	High	Moderate	0.37	5
	5–70	<0.06	0.14–0.18	4.5–5.5	High	High	Moderate	0.32	
Dorovan: Do.	0–85	<0.06	0.25–0.50	4.5–5.5		High	High		
	85–95	6.0–20	0.05–0.08	4.5–5.5	Low	High	High		
Freest: FrA, FrB, FrC.	0–6	0.6–2.0	0.10–0.15	4.5–5.5	Low	Moderate	High	0.28	5
	6–15	0.2–0.6	0.15–0.18	4.5–6.0	Moderate	High	Moderate	0.32	
	15–80	0.06–0.2	0.15–0.18	4.5–7.3	High	High	Moderate	0.32	
*Heidel: HeD, HeE, HTF. For Troup part of HTF, see Troup series.	0–11	0.6–2.0	0.10–0.15	4.5–5.5	Low	Low	Moderate	0.20	5
	11–80	0.6–2.0	0.10–0.15	4.5–5.5	Low	Low	Moderate	0.20	
Jena: Je.	0–9	0.6–2.0	0.12–0.20	4.5–6.0	Low	Low	High		
	9–70	0.6–2.0	0.10–0.20	4.5–5.5	Low	Low	High		
*Kirkville: Kk, KR. For Mantachie part of Kk and Jena part of KR, see respective series.	0–10	0.6–2.0	0.12–0.22	4.5–5.5	Low	Moderate	High		
	10–70	0.6–2.0	0.10–0.15	4.5–5.5	Low	Moderate	High		
Lakeland: LaD, LaE.	0–42	>20	0.05–0.08	4.5–6.0	Very low	Low	Moderate	0.17	5
	42–78	>20	0.03–0.08	4.5–6.0	Very low	Low	Moderate	0.17	
Leeper: Le.	0–5	0.06–0.2	0.18–0.22	5.6–8.4	High	High	Low		
	5–55	<0.06	0.18–0.20	5.6–8.4	High	High	Low		
Louin: Lo.	0–2	0.6–2.0	0.18–0.20	4.5–5.5	Moderate	High	High	0.32	4
	2–60	<0.06	0.14–0.18	4.5–5.5	Very high.	High	High	0.28	
	60–90	<0.06	0.14–0.18	5.6–7.8	Very high.	High	Moderate	0.28	
Lucy.	0–27	>6.0	0.06–0.10	5.1–5.5	Low	Low	High	0.17	5
	27–65	0.6–2.0	0.12–0.14	4.5–5.5	Low	Low	High	0.28	
*Mantachie: MM. For Mathiston part of MM, see Mathiston series.	0–6	0.6–2.0	0.10–0.15	4.5–5.5	Low	High	High		
	6–55	0.6–2.0	0.14–0.20	4.5–5.5	Low	High	High		
Marietta: Mr.	0–6	0.6–2.0	0.18–0.22	5.6–7.8	Low	Moderate	Low		
	6–46	0.6–2.0	0.14–0.20	5.6–7.8	Low	Moderate	Low		
	46–65	0.6–2.0	0.14–0.20	5.6–7.8	Moderate	Moderate	Low		
Mathiston.	0–9	0.6–2.0	0.18–0.22	4.5–5.5	Low	High	High		
	9–55	0.6–2.0	0.18–0.22	4.5–5.5	Low	High	High		
McLaurin: MuB, MuC.	0–10	6.0–20	0.05–0.10	4.5–5.5	Low	Low	Moderate	0.17	5
	10–47	0.6–2.0	0.10–0.15	4.5–5.5	Low	Low	Moderate	0.20	
	47–80	0.6–2.0	0.10–0.15	4.5–5.5	Low	Low	Moderate	0.20	

TABLE 7.—*Estimated physical and chemical properties*—Continued

Soil series and may symbols	Depth from surface	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	*In/hr*	*In/in of soil*	*pH*					
Okolona: OkB2.	0–16	<0.06	0.20–0.22	6.6–8.4	High	High	Moderate	0.37	4
	16–55	<0.06	0.18–0.20	6.6–8.4	Very high.	High	Moderate	0.32	
	55–105								
Ora: OrB2, OrC2, OrD2.	0–5	2.0–6.0	0.10–0.13	4.5–5.5	Low	Moderate	High	0.32	3
	5–28	0.6–2.0	0.12–0.18	4.5–5.5	Low	Moderate	High	0.37	
	28–55	0.2–0.6	0.05–0.10	4.5–5.5	Low	Moderate	High	0.37	
	55–70	0.6–2.0	0.10–0.15	4.5–5.5	Low	Moderate	High	0.32	
Prentiss: PrA, PrB.	0–12	0.6–2.0	0.12–0.16	4.5–5.5	Low	Moderate	High	0.24	3
	12–25	0.2–0.6	0.06–0.09	4.5–5.5	Low	Moderate	High	0.24	
	25–60	0.6–2.0	0.12–0.16	4.5–5.5	Low	Moderate	High	0.20	
Ruston: RuB, RuC.	0–12	0.6–2.0	0.09–0.16	5.1–6.5	Low	Low	Moderate	0.28	5
	12–26	0.6–2.0	0.12–0.17	4.5–6.0	Low	Moderate	Moderate	0.28	
	26–43	0.6–2.0	0.12–0.15	4.5–6.0	Low	Low	Moderate	0.28	
	43–90	0.6–2.0	0.12–0.17	4.5–6.0	Low	Moderate	Moderate	0.28	
Savannah: SaA, SaB, SaC.	0–6	0.6–2.0	0.10–0.15	4.5–5.5	Low	Moderate	High	0.28	3
	6–30	0.6–2.0	0.13–0.20	4.5–5.5	Low	Moderate	High	0.28	
	30–65	0.2–0.6	0.05–0.10	4.5–5.5	Low	Moderate	High	0.24	
Shubuta: SbB2, SbC.	0–8	0.6–2.0	0.12–0.16	4.5–6.0	Low	High	High	0.37	5
	8–52	0.2–0.6	0.14–0.18	4.5–5.5	Moderate	High	High	0.28	
	52–70	0.2–0.6	0.14–0.18	4.5–5.5	Moderate	High	High	0.28	
*Smithdale: SdD2, SdE, SEF. For Lucy part of SEF, see Lucy series.	0–10	2.0–6.0	0.14–0.16	4.5–5.5	Low	Low	Moderate	0.28	5
	10–35	0.6–2.0	0.15–0.17	4.5–5.5	Low	Low	Moderate	0.28	
	35–80	2.0–6.0	0.14–0.16	4.5–5.5	Low	Low	Moderate	0.24	
Stough: Sf.	0–16	0.6–2.0	0.12–0.18	4.5–5.5	Low	Moderate	High	0.28	3
	16–39	0.2–0.6	0.07–0.11	4.5–5.5	Low	Moderate	High	0.37	
	39–70	0.2–0.6	0.07–0.11	4.5–5.5	Low	Moderate	High	0.37	
Sumter: SmC2, SmD2.	0–5	0.06–2.0	0.12–0.17	7.4–8.4	High	Moderate	Low	0.37	3
	5–35	0.06–2.0	0.12–0.17	7.4–8.4	High	Moderate	Low	0.28	
	35–60								
Susquehanna: SnB, SnC2.	0–7	0.6–2.0	0.10–0.15	4.5–5.5	Low	High	High	0.43	3
	7–70	<0.06	0.15–0.20	4.5–5.5	High	High	High	0.32	
*Sweatman: StD2, SwE2, SXE, SYE. For Smithdale parts of SwE2 and SYE, see Smithdale series.	0–5	0.6–2.0	0.20–0.22	4.5–5.5	Low	High	High	0.37	3
	5–42	0.2–0.6	0.16–0.20	4.5–5.5	Moderate	High	High	0.28	
	42–70	0.2–0.6	0.10–0.18	4.5–5.5	Moderate	High	High	0.28	
Troup: TrD.	0–7	6.0–20	0.05–0.08	4.5–5.5	Very low	Low	Moderate	0.17	5
	7–59	6.0–20	0.05–0.10	4.5–5.5	Very low	Low	Moderate	0.17	
	59–88	0.6–2.0	0.10–0.13	4.5–5.5	Low	Low	Moderate	0.20	
*Una: Un. For Urbo part of Un, see Urbo series.	0–4	<0.06	0.15–0.20	4.5–5.5	High	High	High		
	4–65	<0.06	0.15–0.20	4.5–5.5	High	High	High		
Urbo: UR.	0–6	0.06–0.2	0.19–0.21	4.5–5.5	Low	High	High		
	6–65	<0.06	0.15–0.20	4.5–5.5	High	High	High		
Vaiden: VaB, VaC, VaD2.	0–2	0.06–0.2	0.10–0.15	4.5–6.5	Very high.	High	High	0.32	4
	2–30	<0.06	0.10–0.15	4.5–6.0	Very high.	High	High	0.28	
	30–68	<0.06	0.10–0.15	4.5–7.8	Very high.	High	High	0.28	

TABLE 8.—*Soil and*

[An asterisk in the first column indicates that at least one mapping unit is made of two or more kinds of soil. The soils in such for referring to other series as indicated. Absence of an entry indicates the feature is not a concern. See text

Soil series and map symbols	Hydrologic group	Flooding		
		Frequency	Duration	Months
Adaton: Ad	D	None		
Bassfield: BaB	B	None		
Bibb: Bb	C	Common	Brief	December to May
Boswell: BoB, BoC	D	None		
Dorovan: Do	D	Frequent	Very long	January to December
Freest: FrA, FrB, FrC	C	None		
*Heidel: HeD, HeE, HTF For Troup part of HTF, see Troup series.	B	None		
Jena: Je	B	Common	Very brief to long	December to April
*Kirkville: Kk, KR For Mantachie part of Kk and Jena part of KR, see respective series.	C	Common	Brief	January to April
Lakeland: LaD, LaE	A	None		
Leeper: Le	D	Common	Brief	January to March
Louin: Lo	D	None		
Lucy	A	None		
*Mantachie: MM For Mathiston part of MM, see Mathiston series.	C	Common	Brief	January to March
Marietta: Mr	C	Common	Brief	January to March
Mathiston	C	Common	Very brief to long	January to April
McLaurin: MuB, MuC	B	None		
Okolona: OkB2	D	None		
Ora: OrB2, OrC2, OrD2	C	None		
Prentiss: PrA, PrB	C	None		
Ruston: RuB, RuC	B	None		
Savannah: SaA, SaB, SaC	C	None		
Shubuta: SbB2, SbC	C	None		
*Smithdale: SdD2, SdE, SEF For Lucy part of SEF, see Lucy series.	B	None		
Stough: Sf	C	None		
Sumter: SmC2, SmD2	C	None		
Susquehanna: SnB, SnC2	D	None		
*Sweatman: StD2, SwE2, SXE, SYE. For Smithdale part of SwE2 and SYE, see Smithdale series.	C	None		

water features

mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for descriptions of ratings and such terms as "rare," "brief," and "perched." The symbol > means greater than]

High water table			Bedrock	
Depth	Kind	Months	Depth	Hardness
Ft			*In*	
0–0.5	Apparent	January to April	>60	
>6.0			>60	
0.5–1.5	Apparent	December to April	>60	
>6.0			>60	
0–0.5	Apparent	January to December	>60	
1.5–2.5	Apparent	January to April	>60	
>6.0			>60	
>6.0			>60	
1.5–2.5	Apparent	January to April	>60	
>6.0			>60	
1.0–2.0	Apparent	January to March	>60	
0–2.0	Apparent	January to April	>60	
>6.0			>60	
1.0–1.5	Apparent	December to March	>60	
1.5–2.0	Apparent	January to March	>60	
1.5–2.5	Apparent	January to April	>60	
>6.0			>60	
4.0–6.0	Apparent	January to March	48–99	Rippable.
2.0–3.5	Perched	February to April	>60	
2.0–2.5	Perched	January to March	>60	
>6.0			>60	
1.5–3.0	Perched	January to March	>60	
>6.0			>60	
>6.0			>60	
1.0–1.5	Perched	January to April	>60	
>6.0			20–40	Rippable.
>6.0			>60	
>6.0			>60	

TABLE 8.—*Soil and*

Soil series and map symbols	Hydrologic group	Flooding		
		Frequency	Duration	Months
Troup: TrD	A	None		
*Una: Un For Urbo part of Un, see Urbo series.	D	Common	Brief to long	January to March
Urbo: UR	D	Common	Brief to long	January to March
Vaiden: VaB, VaC, VaD2	D	None		

about 56 inches a year, and annual snowfall is generally light. The high rainfall and temperature have favored soil formation. Many of the soils are strongly weathered, highly leached, acid, and low in natural fertility.

The climate is uniform throughout the county; therefore, differences in soils within the county cannot be explained on the basis of differences in climate.

Parent material

The soils of Jasper County formed mainly from parent materials that were derived from geologic formations that are exposed at the surface. Strata exposed at the surface dip south-southwest at 31 feet per mile and range from upper beds of the Kosciusko Formation of mid-Eocene age to terrace beds of the Holocene Epoch (*5*).

The Eocene Series consists of the Claiborne Group, which includes the Kosciusko, Wautubbee, and Cockfield Formations. The Oligocene Series consists of the Vicksburg Group, which includes Byram Marl, Glendon Limestone, Marianna Limestone, and the Bucatunna Mint Springs, Forest Hill, and Red Bluff Formations. The Miocene Series consists of the Catahoula Formation and the Payne Hammack and Chickasawhay equivalents. The Pleistocene Series consists of the Citronelle Formation.

Relief

Relief, or shape of the landscape, influences soil formation through its effects on drainage, erosion, plant cover, and soil temperature.

The relief of Jasper County ranges from nearly level to steep. Slope ranges from 0 to 30 percent. The maximum difference in elevation is between the valleys and the crest of the adjacent hills. It is about 150 feet.

The flood plains are wide along the larger creeks throughout the county. The western and northern parts of the county have uplands that are nearly level to strongly sloping and have some side slopes that are steep. The eastern part of the county has narrow ridgetops and steep side slopes.

Time

Usually a long period of time is required for soil formation. Differences in the length of time account for most of the soil differences not attributed to the other factors of soil formation. The soils along the streams are the youngest in the county, and the soils on the uplands are the oldest. The old soils have a greater degree of horizon differentiation than the young soils.

Most of the soils that formed on the smoother parts of the uplands and on older stream terraces have a well defined soil profile. These soils have an A horizon and a B horizon in which silicate clay has accumulated. Boswell, Shubuta, and Ruston soils are examples of older soils.

The soil materials of the flood plains are more recent than the materials of other parts of the landscape. These materials have been altered, but they have not formed into mature soils. An A horizon and a B horizon have developed, but silicate clay has not accumulated. Mantachie and Leeper soils are examples of these soils.

Morphology

The soil profile, or a vertical section consisting of layers or horizons, extends from the surface down to material that is not soil. It may extend to several feet in places or only 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 (*13*). 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 Jasper County have reached this stage of formation and are mature soils. Some soils, however, do not have a B horizon but have A and C horizons and are young soils. Such soils are on 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, for example A1, A2, Ap, B1, B2, B3, and

water features—Continued

High water table			Bedrock	
Depth	Kind	Months	Depth	Hardness
			In	
>6			>60	
0.5–1.0	Apparent	November to April	>60	
1.0–2.0	Apparent	January to March	>60	
1.0–2.0	Apparent	November to March	>60	Rippable.

Bx. The subdivisions provide clues to the soil-forming factors that have left marks in the profiles and are important in classification and use and management of the soils.

The A horizon generally has the highest organic matter content, has the most active biological processes, and 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 has less organic matter content and less biological activity and, under moderately well drained or well drained conditions, has brighter colors than the A horizon. 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 red colors of this horizon are caused partly by iron compounds that have been removed from the surface layer and redeposited in the B horizon. These colors are found in the Savannah and Ruston soils of Jasper County.

The C horizon is commonly lighter in color, is lower in organic matter content, and has less biological activity than the A or B horizon. 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 the wind.

Classification of the soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

The narrow categories of classification, such as those used in detailed soil surveys, allow us to organize and apply knowledge about soils in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas such as countries and continents.

The system of soil classification was adopted by the National Cooperative Soil Survey in 1965 (*15*). Because this system is under continual study, readers interested in developments of the current system should search the latest literature available.

The current system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped. In table 14, the soil series of Jasper County are placed in categories of the current system. Classes of the current system are briefly defined in the following paragraphs.

ORDER: Ten soil orders are recognized. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this are the Entisols and Histosols, which occur in many different climates. Each order is named with a word of three or four syllables ending in *sol* (Inceptisol).

SUBORDER: Each order is divided into suborders that are based primarily on those soil characteristics that seem to produce classes that have the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of water-logging, or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order. An example is *Aquept* (*Aqu,* meaning water or wet, and *ept,* from Inceptisol).

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; those that have pans that interfere with growth of roots, move-

TABLE 9.—*Soil ratings for sanitary facilities*

[An asterisk in the first column indicates that at least one mapping unit is made of two or more kinds of soil. The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series as indicated. "Floods" and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil series and map symbols	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Adaton: Ad	Severe: percs slowly; wetness.	Slight	Severe: wetness; too clayey.	Severe: wetness	Poor: wetness; too clayey.
Bassfield: BaB	Slight	Severe: seepage	Severe: seepage	Severe: seepage	Fair: thin layer.
Bibb: Bb	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Poor: wetness.
Boswell: BoB, BoC	Severe: percs slowly.	Moderate: slope	Severe: too clayey.	Slight	Poor: too clayey.
Dorovan: Do	Severe: wetness; floods.	Severe: wetness; floods; excess humus.	Severe: wetness; floods; excess humus.	Severe: wetness; floods.	Poor: wetness; floods; excess humus.
Freest:					
FrA	Severe: percs slowly; wetness.	Slight	Moderate: too clayey; wetness.	Severe: wetness	Fair: thin layer.
FrB, FrC	Severe: percs slowly.	Moderate: slope	Moderate: too clayey.	Severe: wetness	Fair: thin layer.
*Heidel:					
HeD	Moderate: slope	Severe: seepage; slope.	Severe: seepage	Severe: seepage	Fair: slope.
HeE, HTF For Troup part of HTF, see Troup series.	Severe: slope	Severe: seepage; slope.	Severe: seepage; slope.	Severe: seepage; slope.	Poor: slope.
Jena: Je	Severe: floods	Severe: floods; seepage.	Severe: floods; too sandy; seepage.	Severe: floods; seepage.	Good.
*Kirkville: Kk, KR For Mantachie part of Kk and Jena part of KR, see respective series.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Good.
Lakeland:					
LaD	Moderate: slope	Severe: seepage; slope.	Severe: seepage; too sandy.	Severe: seepage	Poor: too sandy; seepage.
LaE	Severe: slope	Severe: seepage; slope.	Severe: seepage; too sandy.	Severe: seepage; slope.	Poor: too sandy; slope; seepage.
Leeper: Le	Severe: percs slowly; wetness; floods.	Severe: floods; wetness.	Severe: too clayey; floods; wetness.	Severe: floods; wetness.	Poor: too clayey; wetness.
Louin: Lo	Severe: percs slowly; wetness.	Slight	Severe: too clayey; wetness.	Severe: wetness	Poor: too clayey.
Lucy	Severe: slope	Severe: seepage	Slight	Moderate: slope	Fair: too sandy; slope.
*Mantachie: MM For Mathiston part of MM, see Mathiston series.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Good.
Marietta: Mr	Severe: floods, wetness.	Moderate: seepage; floods.	Severe: floods; wetness.	Severe: floods; wetness.	Good.

TABLE 9.—*Soil ratings for sanitary facilities*—Continued

Soil series and map symbols	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Mathiston	Severe: floods; wetness.	Moderate: seepage.	Severe: floods	Severe: floods	Fair: too clayey.
McLaurin: MuB, MuC.	Slight	Severe: seepage	Severe: seepage	Severe: seepage	Good.
Okolona: OkB2	Severe: percs slowly.	Moderate: slope	Severe: too clayey.	Slight	Poor: too clayey.
Ora: OrB2, OrC2	Severe: percs slowly.	Moderate: slope	Slight	Slight	Good.
OrD2	Severe: percs slowly.	Severe: slope	Slight	Moderate: slope	Good.
Prentiss: PrA	Severe: percs slowly; wetness.	Slight	Severe: wetness	Severe: wetness	Good.
PrB	Severe: percs slowly; wetness.	Moderate: slope	Severe: wetness	Severe: wetness	Good.
Ruston: RuB, RuC	Slight	Moderate: seepage; slope.	Slight	Slight	Good.
Savannah: SaA	Severe: percs slowly.	Slight	Slight	Slight	Good.
SaB, SaC	Severe: percs slowly.	Moderate: slope	Slight	Slight	Good.
Shubuta: SbB2, SbC.	Severe: percs slowly.	Moderate: slope	Moderate: too clayey.	Slight	Poor: too clayey.
*Smithdale: SdD2	Moderate: slope	Severe: seepage; slope.	Slight	Moderate: slope	Fair: slope.
SdE, SEF For Lucy part of SEF, see Lucy series.	Severe: slope	Severe: seepage; slope.	Moderate: slope	Severe: slope	Poor: slope.
Stough: Sf	Severe: percs slowly; wetness.	Moderate: seepage.	Moderate: wetness.	Moderate: wetness.	Good.
Sumter: SmC2	Severe: percs slowly; depth to rock.	Severe: depth to rock.	Severe: depth to rock; too clayey.	Slight	Poor: too clayey.
SmD2	Severe: percs slowly; depth to rock.	Severe: slope; depth to rock.	Severe: depth to rock; too clayey.	Moderate: slope	Poor: too clayey.
Susquehanna: SnB, SnC2.	Severe: percs slowly.	Moderate: slope	Severe: too clayey; wetness.	Moderate: wetness.	Poor: too clayey.
*Sweatman: StD2, SwE2 For Smithdale part of SwE2, see Smithdale series, unit SdE.	Severe: percs slowly; slope.	Severe: slope	Moderate: too clayey.	Moderate: slope	Poor: thin layer.

TABLE 9.—*Soil ratings for sanitary facilities*—Continued

Soil series and map symbols	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Sweatman—Con.					
SXE, SYE	Severe: slope; percs slowly.	Severe: slope	Moderate: too clayey.	Severe: slope	Poor: slope; thin layer.
For Smithdale part of SYE, see Smithdale series, unit SdE.					
Troup:					
Troup part of HTF.	Severe: slope	Severe: seepage; slope.	Severe: seepage; slope.	Severe: seepage; slope.	Poor: slope; too sandy.
TrD	Moderate: slope	Severe: seepage; slope.	Severe: seepage	Severe: seepage	Fair: too sandy.
Una: Un	Severe: floods; percs slowly; wetness.	Severe: wetness; floods.	Severe: wetness; floods; too clayey.	Severe: wetness; too clayey; floods.	Poor: wetness; too clayey.
For Urbo part of Un, see Urbo series.					
Urbo: UR	Severe: percs slowly; floods; wetness.	Severe: floods	Severe: too clayey; wetness; floods.	Severe: floods; wetness.	Poor: too clayey; wetness; thin layer.
Vaiden:					
VaB, VaC	Severe: percs slowly; wetness.	Moderate: slope	Severe: too clayey; wetness.	Severe: wetness	Poor: too clayey.
VaD2	Severe: percs slowly.	Severe: slope	Severe: too clayey; wetness.	Severe: wetness	Poor: too clayey.

ment of water, or both; and thick, dark-colored surface horizons. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark red and dark brown colors associated with basic rocks, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Haplaquepts (*Hapl,* meaning simple horizons, *aqu* for wetness or water, and *ept,* from Inceptisol).

SUBGROUP: Great groups are divided into subgroups, one representing the central (typic) segment of the group, and others, called intergrades, that have properties of the 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 any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Haplaquepts (a typical Haplaquept).

FAMILY: Soil families are separated within a subgroup primarily on the basis of properties important to the growth of plants or on the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for texture, mineralogy, and so on, that are used as family differentiae. An example is the fine, mixed, acid, thermic family of Typic Haplaquepts.

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 Una series.

Physical and chemical properties of the soils[6]

The results from physical and chemical analyses of selected soils in Jasper County are given in table 15. These analyses were made in the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station. To determine particle size and textural classes, combined hydrometer and sieve separations were used (*4*).

The procedures that were generally used for the chemical analyses are outlined in Soil Survey Investigations Report Number 1 (*14*). Selected samples were collected from open pits. In the laboratory the samples were air-dried, carefully crushed and mixed, and sieved through a No. 10 sieve. All results were reported on an ovendry basis. Soil reaction was obtained by using a glass-electrode pH meter and a sample ratio of one

[6] V. E. NASH, agronomist, Mississippi Agricultural and Forestry Experiment Station, helped to prepare this section.

TABLE 10.—*Ratings of soils as sources of construction material*

[An asterisk in the first column indicates that at least one mapping unit is made of two or more kinds of soil. The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series as indicated. "Shrink-swell" and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," and "unsuited." Absence of an entry means soil was not rated]

Soil series and map symbols	Roadfill	Sand	Gravel	Topsoil
Adaton: Ad	Poor: wetness; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, too clayey.
Bassfield: BaB	Good	Poor: excess fines	Unsuited: excess fines.	Good.
Bibb: Bb	Poor: wetness	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Boswell: BoB, BoC	Poor: shrink-swell; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Dorovan: Do	Poor: wetness; excess humus.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness; excess humus.
Freest: FrA, FrB, FrC	Poor: shrink-swell; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
*Heidel: HeD	Good	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
HeE, HTF. For Troup part of HTF, see Troup series.	Fair: slope	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Jena: Je	Fair: low strength	Poor: excess fines	Unsuited: excess fines.	Good.
*Kirkville: Kk, KR. For Mantachie part of Kk and Jena part of KR, see respective series.	Good	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Lakeland: LaD	Good	Good	Unsuited: excess fines.	Poor: too sandy.
LaE	Fair: slope	Good	Unsuited: excess fines.	Poor: too sandy; slope.
Leeper: Le	Poor: shrink-swell; low strength; wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey; wetness.
Louin: Lo	Poor: shrink-swell; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Lucy	Good	Poor: excess fines	Poor: excess fines	Poor: too sandy.
*Mantachie: MM. For Mathiston part of MM, see Mathiston series.	Fair: wetness; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Marietta: Mr	Fair: low strength	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey; thin layer.
Mathiston	Poor: low strength	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
McLaurin: MuB, MuC	Good	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Okolona: OkB2	Poor: shrink-swell; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.

TABLE 10.—*Ratings of soils as sources of construction material*—Continued

Soil series and map symbols	Roadfill	Sand	Gravel	Topsoil
Ora: OrB2, OrC2, OrD2	Fair: low strength	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
Prentiss: PrA, PrB	Fair: low strength	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Ruston: RuB, RuC	Fair: low strength	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Savannah: SaA, SaB, SaC.	Fair: low strength	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Shubuta: SbB2, SbC	Poor: low strength	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey; thin layer.
*Smithdale: SdD2	Good	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
SdE, SEF. For Lucy part of SEF, see Lucy series.	Fair: slope	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Stough: Sf	Fair: wetness; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Sumter: SmC2, SmD2	Poor: shrink-swell; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Susquehanna: SnB, SnC2.	Poor: shrink-swell	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Sweatman: StD2	Fair: shrink-swell	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
SwE2, SXE, SYE. For Smithdale part of SwE2, and SYE, see SdE of Smithdale series.	Fair: shrink-swell; slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Troup: TrD	Good	Fair: excess fines	Poor: excess fines	Fair: slope.
Troup part of HTF	Fair: slope	Fair: excess fines	Poor: excess fines	Poor: slope.
*Una: Un. For Urbo part of Un, see Urbo series.	Poor: wetness; shrink-swell; low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Urbo: UR	Poor: shrink-swell; wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: wetness; too clayey.
Vaiden: VaB, VaC, VaD2.	Poor: low strength; shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.

part soil to one part water. Exchangeable cations, calcium, magnesium, potassium, and sodium were extracted by neutral, normal ammonium acetate solution. Calcium and magnesium were determined by atomic absorption using strontium chloride to suppress interference by aluminum, silicon, and phosphorus. Potassium and sodium were determined by flame photometry. Extractable acidity, or exchangeable hydrogen and aluminum, was displaced from the soil with triethanolamine and barium chloride at pH 8.2. The percent base saturation was determined by dividing the sum of exchangeable bases by the sum of exchangeable bases plus the extractable acidity and multiplying the result by one hundred.

Such physical properties of soil, as water infiltration and hydraulic conductivity, shrink-swell potential, crusting, tilth, consistence, and available water capacity are closely related to texture.

The Okolona and Vaiden soils are somewhat high in montmorillonite. This clay causes shrinking and swell-

TABLE 11.—*Ratings of soils as construction sites*

[An asterisk in the first column indicates that at least one mapping unit is made of two or more kinds of soil. The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series as indicated. "Shrink-swell," "floods," and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," moderate," and "severe." Absence of an entry means soil was not rated]

Soil series and map symbols	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Adaton: Ad	Severe: wetness; too clayey.	Severe: wetness	Severe: wetness	Severe: wetness; corrosiveness.	Severe: wetness; low strength.
Bassfield: BaB	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
Bibb: Bb	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.
Boswell: BoB, BoC	Severe: too clayey.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength; corrosive.	Severe: shrink-swell; low strength.
Dorovan: Do	Severe: wetness; floods, excess humus.	Severe: wetness; floods; low strength.	Severe: wetness; floods; low strength.	Severe: wetness; floods; low strength.	Severe: wetness; floods; low strength.
Freest:					
FrA, FrB	Severe: wetness	Moderate: wetness; shrink-swell.	Severe: wetness	Moderate: wetness; shrink-swell.	Moderate: shrink-swell.
FrC	Severe: wetness	Moderate: wetness; shrink-swell.	Severe: wetness	Moderate: wetness; shrink-swell; slope.	Moderate: shrink-swell.
*Heidel:					
HeD	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
HeE, HTF For Troup part of HTF, see Troup series.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Jena: Je	Severe: floods; too sandy; cutbanks cave.	Severe: floods	Severe: floods	Severe: floods	Severe: floods.
*Kirkville: Kk, KR For Mantachie part of Kk and Jena part of KR, see respective series.	Severe: floods; wetness.	Severe: floods	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods.
Lakeland:					
LaD	Severe: cutbanks cave.	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
LaE	Severe: cutbanks cave; slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Leeper: Le	Severe: wetness; floods; too clayey.	Severe: floods; wetness; shrink-swell.	Severe floods; wetness; shrink-swell.	Severe: shrink-swell; wetness; floods.	Severe: shrink-swell; wetness; floods.
Louin: Lo	Severe: too clayey; wetness.	Severe: shrink-swell; wetness; low strength.	Severe: shrink-swell; wetness; low strength.	Severe: corrosive; shrink-swell; wetness.	Severe: shrink-swell; low strength.
Lucy	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
*Mantachie: MM For Mathiston part of MM, see Mathiston series.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods.

TABLE 11.—*Ratings of soils as construction sites*—Continued

Soil series and map symbols	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Marietta: Mr	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; low strength.
Mathiston	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness; corrosive.	Severe: floods; low strength.
McLaurin:					
MuB	Slight	Slight	Slight	Slight	Slight.
MuC	Slight	Slight	Slight	Moderate: slope	Slight.
Okolona: OkB2	Severe: too clayey.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: shrink-swell; corrosive; low strength.	Severe: shrink-swell; low strength.
Ora:					
OrB2, OrC2	Slight	Moderate: low strength.	Moderate: low strength.	Moderate: low strength; slope.	Moderate: low strength.
OrD2	Moderate: slope	Moderate: low strength; slope.	Moderate: low strength; slope.	Severe: slope	Moderate: low strength; slope.
Prentiss: PrA, PrB	Severe: wetness	Moderate: wetness; low strength.	Severe: wetness	Moderate: wetness; low strength.	Moderate: low strength.
Ruston:					
RuB	Slight	Slight	Slight	Slight	Moderate: low strength.
RuC	Slight	Slight	Slight	Moderate: slope	Moderate: low strength.
Savannah:					
SaA, SaB	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness; corrosive.	Moderate: low strength.
SaC	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness; slope; corrosive.	Moderate low strength.
Shubuta: SbB2, SbC.	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Severe: low strength.
*Smithdale:					
SdD2	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
SdE, SEF For Lucy part of SEF, see Lucy series.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Stough: Sf	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Moderate: wetness.
Sumter:					
SmC2	Severe: depth to rock; too clayey.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.
SmD2	Severe: depth to rock; too clayey.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: slope; shrink-swell; low strength.	Severe: shrink-swell; low strength.
Susquehanna: SnB, SnC2.	Severe: too clayey; wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength; corrosive; shrink-swell.	Severe: low strength; shrink-swell.
*Sweatman:					
StD2	Moderate: too clayey; slope.	Moderate: shrink-swell; slope.	Moderate: shrink-swell; slope.	Severe: slope	Moderate: shrink-swell; slope.

TABLE 11.—*Ratings of soils as construction sites*—Continued

Soil series and map symbols	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Sweatman—Con. SwE2, SXE, SYE ---- For Smithdale part of SwE2, and SYE, see Smithdale series, unit SdE.	Severe: slope ----	Severe: slope ----	Severe: slope ----	Severe: slope ----	Severe: slope.
Troup: TrD ----------	Severe: cutbanks cave.	Moderate: slope --	Moderate: slope --	Severe: slope ----	Moderate: slope.
Troup part of HTF.	Severe: cutbanks cave.	Severe: slope ----	Severe: slope ----	Severe: slope ----	Severe: slope.
*Una: Un ---------- For Urbo part of Un, see Urbo series.	Severe: wetness; floods; too clayey.	Severe: wetness; floods; shrink-swell.	Severe: wetness; floods; shrink-swell.	Severe: floods; wetness; low strength.	Severe: wetness; shrink-swell; floods.
Urbo: UR ----------	Severe: floods; wetness; too clayey.	Severe: floods; wetness; shrink-swell.	Severe: floods; wetness; shrink-swell.	Severe: floods; corrosive; wetness.	Severe: floods; shrink-swell.
Vaiden: VaB, VaC, VaD2.	Severe: too clayey, wetness.	Severe: low strength; shrink-swell.	Severe: low strength; shrink-swell.	Severe: low strength; shrink-swell.	Severe: low strength; shrink-swell.

ing during drying and wetting cycles and makes these soils very unstable as foundations for buildings and roads. Cracks form during dry weather and sometimes damage plant roots. Water infiltration is rapid until the cracks swell closed, and then infiltration and hydraulic conductivity is very slow. The plastic nature of these soils make careful tillage practices imperative. If the soil is too wet during plowing or cultivation, hard, dense clods will result.

The Adaton soil has high silt content, which may result in adverse physical conditions. Often these soils pack excessively. A surface crust is formed by raindrops at times and results in poor seedling germination and emergence. A plowpan also develops easily during tillage.

The surface layer of the McLaurin and Ruston soils is loamy sand or sandy loam. These soils generally allow good infiltration and movement of water through the soil. Tillage requires less effort than on clayey soils, and the moisture content at the time of tillage is not so critical.

The sum of cations in table 15 indicates the cation exchange capacity of the soils. The cation exchange capacity is a measure of the ability of a soil to make nutrients available to plants, and it may be used in places to reflect the kind of clay in a soil. To convert exchangeable cations given in milliequivalents per hundred grams to pounds per acre in the plow layer, a layer about 6 inches thick, the milliequivalents of the cations must be multiplied by a conversion factor: for calcium multiply by 400; for magnesium, 240; for potassium, 780; for sodium, 460; for hydrogen, 20; and for aluminum, 100. It must be noted, however, that these factors are designed for most plow layers, but in very compact or very sandy plow layers, in many subsoil layers, and in uncultivated layers the calculated amounts of nutrients can be inaccurate by as much as 15 to 20 percent. It is also useful to know that 1,000 pounds of calcium carbonate per acre is needed to neutralize 1 milliequivalent per 100 grams of extractable acidity.

Calcium is the dominant basic exchangeable cation in these soils, particularly in the deeper horizons of the Louin and Vaiden soils. Magnesium saturation of these soils ranges from 1 to 10 percent, which is low for balanced plant nutrition. This low saturation is a result of the low magnesium content of the parent material as well as the intensive weathering of these soils. Exchangeable potassium is low in all the soils, commonly less than 0.5 milliequivalent per 100 grams. Louin and Vaiden soils have a higher amount in the subsoil, but less than 1 percent saturation.

All soils listed in table 15 are acid in the upper part of the subsoil, as shown by low pH. The Vaiden soil has high pH in the lower part of the profile.

The classification system of the National Cooperative Soil Survey uses chemical properties of the soil as differentiating criteria in some categories of the system. For example, the Alfisols and Ultisols are separated on the percentage of base saturation deep in the subsoil. Argillic horizons of the Ultisols have base saturation of less than 35 percent at a designated depth, whereas the Alfisols have more than 35 percent. In the soils reported here, McLaurin soils with 23 percent base saturation, are classified as Ultisols and Vaiden soils with 80 percent are classified as Alfisols.

TABLE 12.—*Water management*

[An asterisk in the first column indicates that at least one mapping unit is made of two or more kinds of soil. The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series as indicated. "Seepage," "slope," and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil series and map symbols	Limitations for—			Features affecting—		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Adaton: Ad	Slight	Moderate: piping; unstable fill.	Severe: no water.	Percs slowly; wetness.	Percs slowly; wetness.	Percs slowly; wetness.
Bassfield: BaB	Severe: seepage.	Severe: piping.	Severe: no water.	Not needed	Favorable	Favorable.
Bibb: Bb	Moderate: seepage.	Moderate: piping.	Severe: no water.	Floods; wetness.	Not needed	Not needed.
Boswell: BoB, BoC	Slight	Moderate: compressible; low strength.	Severe: no water.	Slope	Percs slowly; erodes easily.	Percs slowly; erodes easily.
Dorovan: Do	Severe: seepage.	Severe: unstable fill; excess humus.	Severe: excess humus.	Floods	Not needed	Not needed.
Freest: FrA, FrB, FrC.	Slight	Moderate: unstable fill; piping.	Severe: no water.	Percs slowly; slope.	Percs slowly; slope; wetness.	Percs slowly; slope; wetness.
*Heidel: HeD, HeE, HTF. For Troup part of HTF, see Troup series.	Severe: seepage.	Moderate: piping; seepage.	Severe: no water.	Not needed	Erodes easily; slope.	Erodes easily; slope.
Jena: Je	Severe: seepage.	Moderate: low strength; seepage; piping.	Severe: no water.	Not needed	Not needed	Not needed.
*Kirkville: Kk, KR For Mantachie part of Kk and Jena part of KR, see respective series.	Severe: seepage.	Moderate: compressible; unstable fill.	Severe: no water.	Floods; wetness.	Favorable	Favorable.
Lakeland: LaD, LaE	Severe: seepage.	Severe: seepage; piping.	Severe: no water.	Not needed	Not needed	Not needed.
Leeper: Le	Slight	Moderate: unstable fill; compressible.	Severe: no water.	Floods; wetness; percs slowly.	Wetness; percs slowly.	Wetness; percs slowly.
Louin: Lo	Slight	Moderate: unstable fill; low strength.	Severe: no water.	Percs slowly	Percs slowly; wetness.	Percs slowly; wetness.
Lucy	Severe: seepage.	Severe: seepage; piping; erodes easily.	Severe: no water.	Not needed	Too sandy; erodes easily; slope.	Droughty; erodes easily; slope.
*Mantachie: MM For Mathiston part of MM, see Mathiston series.	Moderate: seepage.	Moderate: piping.	Severe: no water.	Wetness; floods.	Wetness	Wetness.
Marietta: Mr	Moderate: seepage.	Moderate: compressible; piping.	Moderate: no water.	Floods; wetness.	Wetness	Wetness.

TABLE 12.—*Water management*—Continued

Soil series and map symbols	Limitations for—			Features affecting—		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Mathiston	Moderate: seepage.	Moderate: piping; low strength.	Severe: no water.	Cutbanks cave; floods; wetness.	Wetness; piping.	Favorable.
McLaurin: MuB, MuC	Severe: seepage.	Moderate: piping.	Severe: no water.	Not needed	Erodes easily	Favorable.
Okolona: OkB2	Slight	Moderate: shrink-swell; unstable fill.	Severe: no water.	Percs slowly; slow intake.	Percs slowly	Favorable.
Ora: OrB2, OrC2, OrD2.	Moderate: seepage.	Moderate: piping.	Severe: no water.	Percs slowly	Favorable	Rooting depth.
Prentiss: PrA, PrB	Moderate: seepage.	Moderate: compressible; piping.	Severe: slow refill; no water.	Percs slowly; wetness; slope.	Percs slowly; wetness; slope.	Percs slowly; wetness; slope.
Ruston: RuB	Moderate: seepage.	Slight	Severe: no water.	Not needed	Favorable	Favorable.
RuC	Moderate: seepage.	Slight	Severe: no water.	Not needed	Favorable	Slope.
Savannah: SaA, SaB, SaC.	Moderate: seepage.	Moderate: low strength; piping.	Severe: no water.	Percs slowly; slope.	Percs slowly; erodes easily.	Percs slowly.
Shubuta: SbB2, SbC.	Slight	Moderate: low strength; piping.	Severe: no water.	Not needed	Erodes easily	Percs slowly; erodes easily.
*Smithdale: SdD2, SdE, SEF. For Lucy part of SEF, see Lucy series.	Severe: seepage.	Moderate: piping; unstable fill.	Severe: no water.	Not needed; slope.	Slope; erodes easily.	Slope; erodes easily.
Stough: Sf	Moderate: seepage.	Moderate: piping; low strength.	Severe: no water.	Percs slowly; wetness; slope.	Percs slowly; wetness.	Percs slowly; wetness.
Sumter: SmC2, SmD2.	Slight	Moderate: shrink-swell; low strength; compressible.	Severe: no water.	Not needed	Complex slope; depth to rock; percs slowly.	Favorable.
Susquehanna: SnB, SnC2.	Slight	Moderate: hard to pack; shrink-swell.	Severe: no water.	Percs slowly; slope.	Percs slowly; slope.	Percs slowly; slope.
*Sweatman: StD2, SwE2, SXE, SYE. For Smithdale part of SwE2 and SYE, see Smithdale series.	Moderate: seepage.	Moderate: low strength.	Severe: no water.	Complex slope	Slope; erodes easily.	Slope; erodes easily.
Troup: TrD	Severe: seepage.	Severe: seepage; piping.	Severe: no water.	Not needed	Too sandy; erodes easily; piping.	Droughty; erodes easily.
*Una: Un For Urbo part of Un, see Urbo series.	Slight	Moderate: compressible.	Severe: no water.	Wetness; floods.	Wetness; percs slowly.	Percs slowly; wetness.

TABLE 12.—*Water management*—Continued

Soil series and map symbols	Limitations for—			Features affecting—		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Urbo: UR	Slight	Moderate: compressible; low strength.	Severe: no water.	Floods; percs slowly; wetness.	Wetness	Wetness; percs slowly.
Vaiden: VaB, VaC, VaD2.	Slight	Moderate: low strength; shrink-swell.	Severe: no water.	Percs slowly	Percs slowly; slope.	Percs slowly; slope.

Low base saturation indicates generally a high degree of weathering of soil material because it is a measure of the extent of the replacement of bases by hydrogen during the leaching process. Usually the calcium/magnesium ratio decreases as degrees of weathering increase.

General nature of the county

The history, trends in farming, climate, drainage and water supply, and mineral resources of Jasper County are discussed in this section.

History

Jasper County was established December 13, 1833, and was named for Sergeant Jasper, hero of Fort Moultrie in the Revolutionary war. At the time the county was established, H. G. Runnels was Governor of Mississippi and Andrew Jackson was President of the United States.

Paulding, located in the east-central part of the county, was selected as the County seat. Paulding grew to be a thriving center of business for a large area, but the eastern part of the County grew at a much faster rate because of smoother topography and more suitable soils for general farming (*10*). In 1906 the County was divided into two Judicial Districts, with Paulding remaining as the County seat of the first Judicial District and Bay Springs as the County seat of the second Judicial District. Today, Paulding is only a fraction of its former size, while Bay Springs has grown to be the County's largest town.

The population of Jasper County has decreased since 1940. In 1940, the total population was 19,484; in 1950, 18,912; in 1960, 16,909; and in 1970, 15,994.

Trends in farming

Although farming plays an important role in the economy of Jasper County, changes in farming methods, acreage controls, and the general decline of small farms have had a marked effect on farming throughout the County. A trend of decreasing farm employment prevails in Jasper County, and in 1960 only 25.2 percent of the county's labor force was engaged in farming or related operations (*10*). However, in contrast to declining farm employment, the value of the county's farm products has continued to increase. The total number of farms decreased from 2,735 in 1954 to 1,080 farms in 1969, but the average size of farms increased from 102.3 acres in 1954 to 170.0 acres in 1969.

When Jasper County was first settled, most of the land was in timber. The timber was soon cut for farming, and cotton, corn, and truck crops became the principal cash crops. The system of farming has steadily changed from row crops to cattle and timber. Today beef cattle and timber are important sources of farm income. Approximately 70,000 acres in the county are sodded to grasses, and 308,000 acres are in forest.

Climate

The climate of Jasper County is influenced mainly by its subtropical location, the huge landmass to the north, and the warm waters of the Gulf of Mexico. The temperature and precipitation for the county are given by months in table 16.

In summer the prevailing southerly winds bring in moist tropical air, but occasionally westerly and northerly winds bring in hot, dry air from the continental mass. If these hot winds last a long time, the county may have a drought. In winter moist tropical air alternates with dry polar air, and the temperature changes suddenly. The dry polar air may bring freezing temperatures, but usually it does not last long. During January snow can be expected only about once in 10 years, and it stays on the ground for only a short time.

Relative humidity is high the year round and averages from 60 to 100 percent for 71 percent of the time. Even when the temperature is below 50° F., the relative humidity averages from 50 to 79 percent for 53 percent of the time. At temperatures above 90°, the relative humidity does not exceed 80 percent.

Precipitation is generally ample throughout the year. Fall is the driest season, and October is the driest month. Rains are often prolonged in winter and spring, because in those seasons the warm air from the gulf rises above the cold air at the surface. Thundershowers account for most of the precipitation during summer

TABLE 13.—*Soil ratings for recreational development*

[An asterisk in the first column indicates that at least one mapping unit is made of two or more kinds of soil. The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series as indicated. "Floods" and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Adaton: Ad	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Bassfield: BaB	Slight	Slight	Moderate: slope	Slight.
Bibb: Bb	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.
Boswell:				
BoB	Severe: percs slowly	Moderate: slope	Severe: percs slowly	Slight.
BoC	Severe: percs slowly	Moderate: slope	Severe: slope; percs slowly.	Slight.
Dorovan: Do	Severe: wetness; floods; excess humus.	Severe: wetness; floods; excess humus.	Severe: wetness; floods; excess humus.	Severe: wetness; floods; excess humus.
Freest:				
FrA, FrB	Moderate: percs slowly; wetness.	Moderate: wetness	Moderate: wetness; percs slowly; slope.	Slight.
FrC	Moderate: percs slowly; wetness.	Moderate: wetness	Severe: slope	Slight.
*Heidel:				
HeD	Moderate: slope	Moderate: slope	Severe: slope	Slight.
HeE, HTF For Troup part of HTF, see Troup series.	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Jena: Je	Severe: floods	Severe: floods	Severe: floods	Severe: floods.
*Kirkville: Kk, KR For Mantachie part of Kk and Jena part of KR, see respective series.	Moderate: floods; wetness.	Moderate: floods; wetness.	Moderate: floods; wetness.	Slight.
Lakeland:				
LaD	Severe: too sandy	Severe: too sandy	Severe: too sandy; slope.	Severe: too sandy.
LaE	Severe: too sandy; slope.	Severe: too sandy; slope.	Severe: too sandy; slope.	Severe: too sandy.
Leeper: Le	Severe: wetness; floods; percs slowly.	Severe: too clayey; wetness; floods.	Severe: wetness; floods; percs slowly.	Severe: too clayey; floods; wetness.
Louin: Lo	Severe: too clayey; percs slowly.	Severe: too clayey	Severe: too clayey; percs slowly.	Severe: too clayey.
Lucy	Moderate: too sandy	Moderate: too sandy	Severe: too sandy	Moderate: too sandy.
*Mantachie:				
Mantachie part of Kk	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness.
MM For Mathiston part of MM, see Mathiston series.	Severe: floods	Moderate: wetness	Severe: floods	Moderate: wetness.
Marietta: Mr	Severe: floods	Moderate: floods	Severe: floods	Moderate: floods.
Mathiston	Severe: floods; wetness.	Moderate: floods; wetness.	Severe: floods	Moderate: floods; wetness.

TABLE 13.—*Soil ratings for recreational development*—Continued

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
McLaurin:				
MuB	Slight	Slight	Slight	Slight.
MuC	Slight	Slight	Moderate: slope	Slight.
Okolona: OkB2	Severe: percs slowly; too clayey.	Severe: too clayey	Severe: percs slowly; too clayey.	Severe: too clayey.
Ora:				
OrB2	Slight	Slight	Moderate: slope	Slight.
OrC2	Slight	Slight	Severe: slope	Slight.
OrD2	Moderate: slope	Moderate: slope	Severe: slope	Slight.
Prentiss:				
PrA	Slight	Slight	Slight	Slight.
PrB	Slight	Slight	Moderate: slope	Slight.
Ruston:				
RuB	Slight	Slight	Moderate: slope	Slight.
RuC	Slight	Slight	Severe: slope	Slight.
Savannah:				
SaA	Slight	Slight	Slight	Slight.
SaB	Slight	Slight	Moderate: slope	Slight.
SaC	Slight	Slight	Severe: slope	Slight.
Shubuta: SbB2, SbC	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight.
*Smithdale:				
SdD2	Moderate: slope	Moderate: slope	Severe: slope	Slight.
SdE, SEF For Lucy part of SEF, see Lucy series.	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Stough: Sf	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness.
Sumter:				
SmC2	Severe: too clayey	Severe: too clayey	Severe: percs slowly; too clayey.	Severe: too clayey.
SmD2	Severe: too clayey	Severe: too clayey	Severe: slope; too clayey.	Severe: too clayey.
Susquehanna:				
SnB	Moderate: percs slowly; wetness.	Moderate: wetness	Moderate: percs slowly; wetness.	Moderate: wetness.
SnC2	Moderate: percs slowly; wetness.	Moderate: wetness	Severe: slope	Moderate: wetness.
*Sweatman:				
StD2, SwE2 For Smithdale part of SwE2, see Smithdale series, unit SdE.	Moderate: percs slowly; slope.	Moderate: slope	Severe: slope	Slight.
SXE, SYE For Smithdale part of SYE, see Smithdale series, unit SdE.	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.

TABLE 13.—*Soil ratings for recreational development*—Continued

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Troup: TrD	Moderate: slope; too sandy.	Moderate: slope; too sandy.	Severe: too sandy	Moderate: too sandy.
Troup part of HTF	Severe: slope	Severe: slope	Severe: too sandy	Moderate: slope; too sandy.
*Una: Un For Urbo part of Un, see Urbo series.	Severe: wetness; floods; percs slowly.	Severe: wetness; floods; too clayey.	Severe: wetness; floods; percs slowly.	Severe: wetness; floods; too clayey.
Urbo: UR	Severe: floods; wetness; percs slowly.	Moderate: wetness; floods; too clayey.	Severe: floods; percs slowly; wetness.	Moderate: wetness; floods; too clayey.
Vaiden: VaB	Severe: too clayey; percs slowly.	Severe: too clayey	Severe: too clayey; percs slowly.	Severe: too clayey.
VaC, VaD2	Severe: too clayey; percs slowly.	Severe: too clayey	Severe: too clayey; percs slowly; slope.	Severe: too clayey.

and early in fall, but these showers generally are widely scattered and local areas may be droughty because the showers bypass them. In any month, however, some local areas may have flash floods when 3 inches or more of rain falls in 24 hours.

Only an average of once in every 13 years are there tornadoes and hailstorms. Gales that are of hurricane force and have windspeeds of 39 to 74 miles per hour come an average of once in 21 years, but prolonged rains from hurricanes are much more frequent.

Soil temperature, within limits, controls the possibilities of plant growth and soil formation. Biological processes in the soil are controlled to a large degree by soil temperature and moisture. All the soils of Jasper County are in the thermic temperature class. This means that at a depth of 20 inches there is a difference of 9° between mean summer and mean winter temperatures and the mean annual temperature is between 59° and 72°.

Drainage and water supply

All of Jasper County is in the Pascagoula River Basin. The southwestern part of the county is drained by the Etehoma and Tallahoma Creeks. The northwestern part of the county is drained by the West

TABLE 14.—*Classification of soil series*

Soil series	Family of higher taxonomic class
Adaton	Fine-silty, mixed, thermic Typic Ochraqualfs.
Bassfield	Coarse-loamy, siliceous, thermic Typic Hapludults.
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents.
Boswell	Fine, mixed, thermic Vertic Paleudalfs.
Dorovan	Dysic, thermic Typic Medisaprists.
Freest	Fine-loamy, siliceous, thermic Aquic Paleudalfs.
Heidel	Coarse-loamy, siliceous, thermic Typic Paleudults.
Jena	Coarse-loamy, siliceous, thermic Fluventic Dystrochrepts.
Kirkville	Coarse-loamy, siliceous, thermic Fluvaquentic Dystrochrepts.
Lakeland	Thermic, coated Typic Quartzipsamments.
Leeper	Fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts.
Louin	Fine, montmorillonitic, thermic Aquentic Chromuderts.
Lucy	Loamy, siliceous, thermic Arenic Paleudults.
Mantachie	Fine-loamy, siliceous, acid, thermic Aeric Fluvaquents.
Marietta	Fine-loamy, siliceous, thermic, Fluvaquentic Eutrochrepts.
Mathiston	Fine-silty, siliceous, acid, thermic Aeric Fluvaquents.
McLaurin	Coarse-loamy, siliceous, thermic Typic Paleudults.
Okolona	Fine, montmorillonitic, thermic Typic Chromuderts.
Ora	Fine-loamy, siliceous, thermic Typic Fragiudults.
Prentiss	Coarse-loamy, siliceous, thermic Glossic Fragiudults.
Ruston	Fine-loamy, siliceous, thermic Typic Paleudults.
Savannah	Fine-loamy, siliceous, thermic Typic Fragiudults.
Shubuta	Clayey, mixed, thermic Typic Paleudults.
Smithdale	Fine-loamy, siliceous, thermic Typic Paleudults.
Stough	Coarse-loamy, siliceous, thermic Fragiaquic Paleudults.
Sumter	Fine, silty, carbonatic, thermic Rendollic Eutrochrepts.
Susquehanna	Fine, montmorillonitic, thermic Vertic Paleudalfs.
Sweatman	Clayey, mixed, thermic Typic Hapludults.
Troup	Loamy, siliceous, thermic Grossarenic Paleudults.
Una	Fine, mixed, acid, thermic Typic Haplaquepts.
Urbo	Fine, mixed, acid, thermic Aeric Haplaquepts.
Vaiden	Very-fine, montmorillonitic, thermic Vertic Hapludalfs.

TABLE 15.—*Physical and chemical*

[Dashes indicate that value was not determined.

Soil	Horizon	Depth	Total clay (<0.002 mm)	Total silt (0.05–0.002 mm)	Total sand (2–0.05 mm)
		In	*Pct*	*Pct*	*Pct*
Adaton silt loam.	A1	0–4	9.1	51.6	40.3
	B21tg	9–26	19.9	51.9	28.2
	B22tg	26–34	21.7	51.1	27.2
	B25tg	65–85			
Boswell fine sandy loam.	B21t	5–12			
	B23t	18–23			
	B3tg	52–70			
Jena sandy loam.	A1	0–9	4.3	24.0	71.7
	B21	9–22	9.3	30.0	60.6
	B22	22–32	6.8	30.0	63.2
	B23	32–47	6.0	26.1	67.9
	B24	47–70	6.0	29.3	64.7
Lakeland sand.	Ap	0–4	.2	8.4	91.4
	C1	4–12	2.5	6.5	91.0
	C2	12–23	.2	9.0	90.8
	C3	23–42	.1	8.2	91.7
Louin silty clay loam.	A1	0–2	39.1	46.0	14.9
	AC1	2–7	53.6	40.5	5.9
	AC2	7–19	55.2	39.7	5.1
	AC3	19–29	55.5	38.9	5.6
	AC4	29–43	55.4	39.2	5.4
	AC5	43–60	54.7	39.8	5.5
	C	60–90	55.3	38.9	5.8
McLaurin loamy sand.	A1	0–3	.1	19.5	80.4
	A2	3–10	.1	25.6	74.3
	B21t	10–19	19.4	26.1	54.5
	B22t	19–38	10.6	26.8	62.6
	B23t & A'2	38–47	8.6	17.3	74.1
	B'24t	47–65	14.4	14.3	71.3
	B'25t	65–80	10.6	11.0	78.4
Okolona clay.	Ap	0–6	55.1	29.3	15.6
	A1	6–16	59.4	27.3	13.3
	AC1	16–23	45.7	43.5	10.8
	C1	55–65	70.1	28.8	1.1
Ora fine sandy loam.	B22t	19–28	22.0	48.9	29.1
	Bx1	28–40	19.5	47.7	32.8
	Bx2	40–55	20.3	45.9	33.8
	Bx3	55–70	18.7	34.2	47.1
Ruston fine sandy loam.	A1	0–5	5.0	28.4	66.5
	A2	5–12	5.5	41.8	52.7
	B21t	12–26	21.0	35.5	43.5
	B22t	26–32	15.5	27.2	57.3
	B23t & A'2	32–43	12.6	18.4	69.0
	B'21t	43–70	20.1	13.7	66.2
Stough fine sandy loam.	B21t	7–13	8.0	38.0	54.0
	B23t	16–39	12.6	39.1	48.3
Vaiden silty clay loam.	A1	0–2	32.4	61.4	6.2
	B21t	2–11	67.2	29.5	3.3
	B22t	11–24	67.8	29.2	3.0
	C1	24–30	63.9	33.1	3.0
	C2	30–40	74.8	23.2	2.0
	C3	40–58	72.3	25.1	2.6
	C4	58–68	78.9	19.5	1.6

analyses of selected soils

The symbol < means less than]

USDA texture class	Reaction (1:1 H_2O)	Exchangeable cations (milliequivalents per 100 grams of soils)					Sum of cations	Base saturation (sum)
		Calcium	Magnesium	Potassium	Sodium	Extractable acidity		
	pH						*Meq/100 g of soil*	*Pct*
Silt loam								
Silt loam								
Silt loam								
	4.7	5.6	4.0	0.1	0.5	6.9	17.1	60
		1.5	2.6	.3	.4	18.0	22.8	21
		.9	2.1	.3	.1	17.6	21.0	16
		5.2	4.1	.4	.5	15.1	25.3	40
Sandy loam	4.6	.4	.6	.1		6.2	7.3	15
Sandy loam	5.1	1.2	1.0	.1		7.4	9.7	23
Sandy loam	5.3	1.7	.4	.1	.1	5.0	7.3	31
Sandy loam	5.1	1.5	.1	.1		4.8	6.5	26
Sandy loam	4.8	.3	.1			8.0	8.4	5
Sand								
Sand								
Sand								
Sand								
Silty clay loam	4.9	4.3	.7	.4	.1	21.7	27.2	20
Silty clay	5.0	6.9	1.0	.3	.1	12.5	20.8	39
Clay	5.1	7.9	1.0	.2	.2	12.7	22.0	42
Clay	5.2	8.7	1.0	.2	.4	12.7	23.0	44
Clay	5.4	9.5	1.1	.2	.5	9.1	20.5	55
Clay	5.2	9.6	1.1	.3	.7	12.7	24.4	47
Clay	5.7	11.0	1.1	.1	.9	8.1	21.2	61
Loamy sand	5.3	.5	1.1	.1		3.7	5.4	31
Loamy sand	5.5	.3	.1			3.8	4.2	10
Sandy loam	5.1	1.5	.4	.2		7.7	9.8	21
Sandy loam	5.2	1.2	.5	.1		5.5	7.3	24
Sandy loam	5.1	.8	.4	.1		5.1	6.3	19
Sandy loam	5.1	1.0	.8	.1		6.6	8.6	23
Sandy loam	5.3	.4	.2	.1	.1	5.4	6.2	11
Clay								
Clay								
Silty clay								
Clay								
Loam								
Loam								
Loam								
Loam								
Fine sandy loam								
Fine sandy loam								
Loam								
Fine sandy loam								
Fine sandy loam								
Sandy clay loam								
Fine sandy loam								
Loam								
Silty clay loam	5.0	9.6	7.6	.3	.1	17.4	35.1	50
Clay	5.0	18.2	3.5	.5	.2	15.7	38.1	59
Clay	4.8	15.8	7.1	.5	.3	16.2	39.9	59
Clay	4.9	15.6	7.2	.4	.4	13.0	36.5	65
Clay	7.2	16.0	9.4	.6	.8	5.3	32.1	84
Clay	7.7	14.3	5.6	.4	1.2	5.3	26.8	80
Clay	7.7	15.7	10.4	.9	1.2	2.4	30.7	92

TABLE 16.—*Temperature*

[All data from the Bay Spring Station, Jasper

Month	Temperature				
	Average daily maximum	Average daily minimum	Average	Average highest	Average lowest
	°F	°F	°F	°F	°F
January	59	37	48	76	17
February	63	40	52	77	21
March	68	45	57	84	27
April	78	54	66	88	37
May	85	61	73	93	42
June	91	67	79	97	57
July	92	70	81	98	64
August	92	69	80	98	61
September	87	64	76	96	51
October	79	52	66	89	36
November	68	43	56	83	26
December	61	38	49	76	20
Annual	77	53	65	[3] 101	[4] 14

[1] Less than one-half day.
[3] T=trace.

Tallahala Creek. The East Tallahala Creek runs through the central part of the county from north to south, and tributaries of the Tallahattah, McVay, Ealiah, and Nuakfuppa Creeks flowing into it. The southeastern part of the county is drained by the Bogue Homo Creek, and the northeast part by the Souinlovey and Twistwood Creeks.

Only the larger creeks have running water all year, and some of them go dry in the drier years. There are several springs and very few artesian wells in the county. Most water for livestock is obtained from numerous manmade ponds and small lakes. In recent years many communities have installed water systems that obtain water from deep wells. Those farms and homes not on community systems obtain water from individual shallow and deep wells.

Mineral resources

Mineral resources of Jasper County include petroleum, sand and gravel, clay, and agricultural limestone. Bentonites are found in several stratigraphic levels, but none at the surface is of sufficient thickness for commercial use (*5*).

Jasper County is one of the most important oil and gas producing counties in Mississippi. The county has five major oilfields. They are the Bay Springs, Heidelberg, Soso, Sharon, and Bryan fields. In 1961, Jasper county ranked fourth among the counties in Mississippi in oil production (*7*).

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and precipitation

County, Miss. for a period through 1970]

Temperature—Continued		Precipitation					
Average number of days with temperature of—		Average total	Greatest total	Smallest total	Greatest daily	Average number of days with—	
90° or above	32° or below					0.10 inch or more	0.50 inch or more
		In	*In*	*In*	*In*		
0	11	5.0	15.2	1.6	3.6	8	4
0	8	5.2	15.7	1.6	6.6	8	4
0	4	6.2	13.2	2.0	5.5	7	3
(1)	(1)	5.4	14.5	.9	6.8	6	3
8	0	4.2	10.1	.7	5.1	6	3
21	0	4.1	11.0	.7	3.9	6	3
23	0	5.5	10.6	1.3	3.4	9	4
23	0	4.1	10.7	1.7	4.4	6	3
12	0	3.9	12.0	.2	3.3	5	2
2	1	2.9	8.2	[2]T	3.7	4	2
0	5	4.1	15.3	.3	5.4	5	2
0	11	5.8	13.0	1.8	4.2	7	4
89	40	56.6	85.6	36.7	6.8	77	36

[3] Mean annual highest temperature.
[4] Mean annual lowest temperature.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.
Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.
Aspect (forestry). The direction toward which a slope faces. Synonym: exposure.
Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single mapping unit.
Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	More than 9

Base saturation. The degree to which material having base exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the exchange capacity
Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
Board foot. The amount of wood in a board 1 foot wide, 1 foot long, and 1 inch thick; 144 cubic inches; 1/12 cubic foot.
Buried soil. A developed soil that once was exposed but now is overlain by more recently formed soil or soil material.
Calcareous soil. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.
Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.
Complex, soil. A mapping unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.
Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.
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, deformed by moderate pressure but can

be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cutbanks cave. Unstable walls of cuts made by earthmoving equipment. The soil sloughs easily.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

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 a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. Inadequate strength for supporting loads.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—few, common, and many; size—fine, medium, and coarse; and contrast—faint, distinct, and prominent. The size measurements are of the diameter along the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are very slow (less than 0.06 inch), slow (0.06 to 0.20 inch), moderately slow (0.2 to 0.6 inch), moderate (0.6 to 2.0 inches), moderately rapid (2.0 to 6.0 inches), rapid (6.0 to 20 inches), and very rapid (more than 20 inches).

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the basis of differences in slope, stoniness, thickness, or some other characteristic that affects management. These differences are too small to justify separate series.

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water forms subsurface tunnels or pipelike cavities in the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH		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.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Surface layer. A term used in nontechnical soil descriptions for the uppermost layer in the profile; usually the A, A1, or Ap horizon.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer. Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

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