Issued September 1971

SOIL SURVEY

Alcorn County, Mississippi

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

Major fieldwork for this soil survey was done in the period 1959–66. Soil names and descriptions were approved in 1967. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1966. This survey was made cooperatively by the Soil Conservation Service and the Mississippi Agricultural Experiment Station. It is part of the technical assistance furnished to the Northeast Mississippi and Tennessee River Soil Conservation Districts.

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

HOW TO USE THIS SOIL SURVEY

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

Locating Soils

All the soils of Alcorn 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 numbers shown on the Index to Map Sheets.

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

Finding and Using Information

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

Interpretations not included in the text can be developed by using the soil map and 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 capability units and woodland groups.

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

Game managers, sportsmen, and others will find information about soils and their suitability for wildlife and fish in the section "Use of the Soils for Wildlife and Fish."

Community planners and others can read about the soil properties that affect the choice of sites for recreation areas in the section "Use of the Soils for Recreation."

Engineers and builders can find, under "Engineering Use 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 were formed and how they are classified in the section "Formation and Classification of Soils."

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

Cover.—Cattle grazing fescue on Paden silt loam, 0 to 2 percent slopes, capability unit IIw-3; in the background is corn on Providence silt loam, 2 to 5 percent slopes, severely eroded, capability unit IIIe-1.

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SOIL SURVEY OF ALCORN COUNTY, MISSISSIPPI

BY KARL H. MILLER, SOIL CONSERVATION SERVICE

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

ALCORN COUNTY is in the northeastern part of Mississippi (fig. 1). It is part of the Coastal Plain. The county has a land area of about 405 square miles, or 259,200 acres.

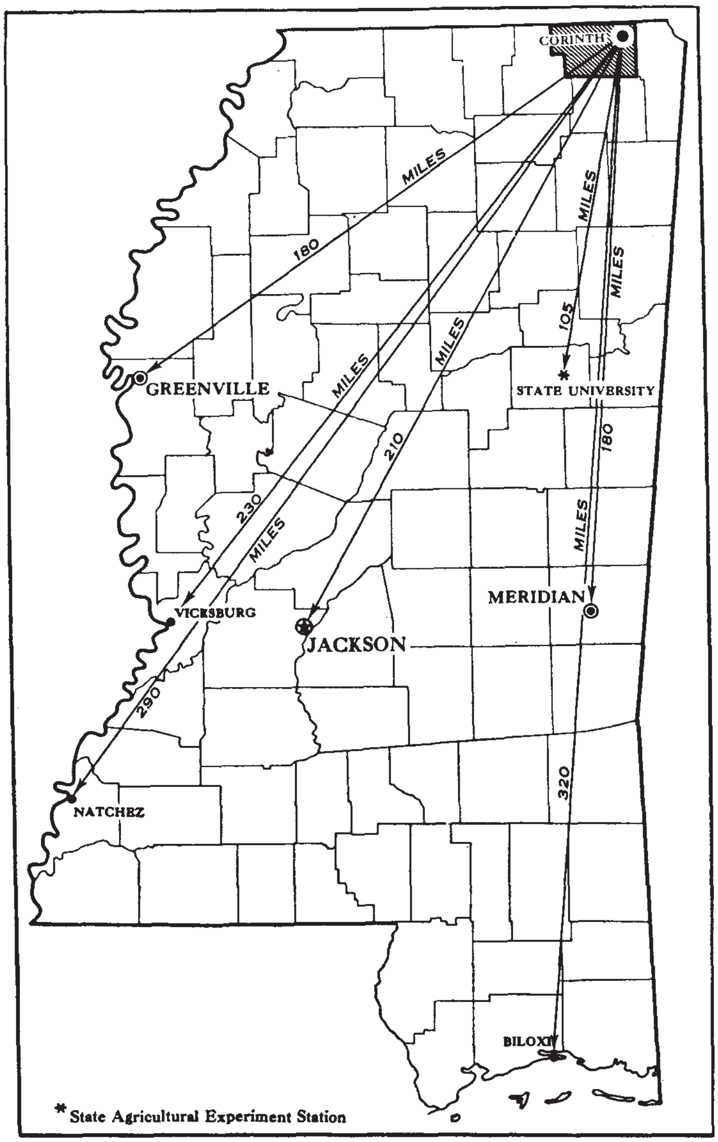

Figure 1.—**Location of Alcorn County in Mississippi.**

Slopes range from nearly level to very steep in Alcorn County. Maximum difference in elevation between valleys and crests of adjoining hills is about 300 feet. The Tuscumbia and Hatchie Rivers and Yellow Creek drain the county.

Cotton, soybeans, corn, and small grains are the main crops. Beef and dairy cattle and poultry are raised on the farms and the products marketed. In more than half the county, the soils are steep or are severely gullied and suitable only for trees. Much of the acreage therefore is wooded, and woodland products are an important source of income.

In 1960, the population of the county numbered 25,282. Many in the county who formerly depended on farming for a living now depend on industry for income. In addition many persons find employment in retail and wholesale trades, transportation and communication companies, and public utilities. Sixty percent of the people employed by industries live outside city limits, and 30 percent of them are part-time farmers.

How This Survey Was Made

Soil scientists made this survey to learn what kind of soils are in Alcorn County, where they are located, and how they can be used. They went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; 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 to the soil material or rock material that has not been changed much by leaching or by roots of plants.

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. To use this survey efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Shubuta and Ruston, 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 go with their behavior in the natural, untouched landscape. Soils of one series can differ somewhat in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soils series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series all the soils having a surface layer of the same texture belong to one soil type. Shubuta loam and Shubuta clay loam are two soil types in the Shubuta series. The difference in texture of their surface layers is apparent from their names.

Some types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates one or more feature that affects management (*12*)[1]. For example, Shubuta loam, 2 to 5 percent slopes, eroded, is one of two phases of Shubuta loam, a soil type that ranges from gently sloping to strongly sloping.

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 woodland, buildings, field borders, roads, trees, and other details that greatly help in drawing boundaries accurately. The soil map at the back of this survey 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 management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. 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 kinds that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientists have a problem of delineating areas where different kinds of soils are so intricately mixed, and so small in size that it is not practical to show them separately on the map. Therefore, they show this mixture of soils as one mapping unit and call it a soil complex. Ordinarily, a soil complex is named for the major kinds of soil in it; for example, Ora-Shubuta complex, 8 to 12 percent slopes.

Some mapping units contain more than one kind of soil in a pattern more open and less intricate than that of a soil complex. Such a mapping unit is called a soil association. A soil association differs from a soil complex in that its component soils can be mapped separately, at ordinary scales such as 4 inches per mile, if practical advantages make the effort worthwhile. A soil association, like a soil complex, is named for the major soils in it; for example, Ruston-Shubuta-Linker association, hilly.

[1] Italic numbers in parentheses refer to Literature Cited, page 52.

Also, on most soil maps, areas are shown that are so rocky, so shallow, or so frequently worked by wind and water that they scarcely can be called soils. In some surveys these areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Gullied land or Riverwash, and are called land types rather than soils. In this survey no land types are mapped separately, but one of them, Gullied land, is mapped as a component part of the Gullied land-Ruston complex, 8 to 40 percent slopes, and the Sumter-Gullied land complex, 8 to 25 percent slopes.

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 soils 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 soils. Yields under defined management are estimated for all the soils in the county.

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 a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in soil surveys. On the basis of the yield and practice tables and other data, the soil scientists set up trial groups, and then test them by further study and by consultation with farmers, agronomists, engineers, and others. The scientists adjust the groups according to the results of their studies and consultations. Thus, the groups that 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 Alcorn County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

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

The soil associations in Alcorn County are discussed in the pages that follow.

1. Ruston-Linker-Shubuta Association

Steep and very steep, well drained and moderately well drained soils that have a sandy loam to clay subsoil; mainly on ridgetops and side slopes

The major soils of this association are on narrow, rolling ridgetops and on long, steep and very steep side slopes. Many of the ridgetops are less than one-eighth mile wide. The side slopes are between the ridgetops and stream bottoms. They are long and wide and generally have slopes of more than 17 percent.

This association occupies about 23 percent of the county. About 40 percent is made up of Ruston soils, 30 percent of Linker soils, 20 percent of Shubuta soils, and the remaining 10 percent of minor soils.

Ruston soils occupy ridgetops and the upper part of steep side slopes and are well drained. Typically they have a surface layer of fine sandy loam and sandy loam. The subsoil is sandy loam and sandy clay loam.

Linker soils occupy middle and upper slopes and sharp breaks above the heads of drainageways. They are well drained. Typically they have a surface layer of fine sandy loam and a subsoil of sandy clay loam that is underlain by sandstone.

Shubuta soils occupy upper and lower slopes and are moderately well drained. Typically they have a surface layer of clay loam that is underlain by clay loam to clay.

Of the minor soils, the Mantachie occupy stream bottoms that are generally less than one-fourth mile wide, and the Cahaba and Ora soils occupy smaller upland areas.

Cotton and corn are the dominant crops on soils in this association. They grow mainly on ridgetops and stream bottoms. Pines and hardwoods are well suited to these soils. Most farms are less than 100 acres in size, and the farmers obtain a large part of their income from employment off the farm.

The soils on the ridgetops and stream bottoms are suited to cultivation, but erosion is a hazard on the ridges and overflow is a hazard on the bottoms. Many side slopes have never been cleared. Large areas of steep slopes that have been cleared and planted to row crops are severely eroded and gullied. Many of these have reverted to trees.

2. Mantachie-Wehadkee Association

Nearly level and level, somewhat poorly drained and poorly drained soils that have a sandy loam to loam subsoil; on flood plains

This soil association consists of areas along the Hatchie River and of areas along small creeks in the western part of the county.

This association occupies about 13 percent of the county. About 60 percent is made up of Mantachie soils, 15 percent of Wehadkee soils, and the remaining 25 percent of minor soils.

Mantachie soils are level and are on broad stream bottoms. They are somewhat poorly drained. Typically they have a surface layer of fine sandy loam and a subsoil of mottled fine sandy loam and loam.

Wehadkee soils are in broad depressions along stream bottoms and are poorly drained. Typically they have a surface layer of fine sandy loam. The subsoil is sandy loam and loam.

The minor soils in this association are those of the Paden series.

Much of this association has been cleared and is in row crops. Cotton, corn, and soybeans are the chief crops grown. The farms average about 100 acres in size, and many farmers obtain a large part of their income off the farm.

Cotton, corn, and soybeans grow moderately well on stream bottoms. Damage to crops by flooding is a potential hazard, and drainage ditches are needed in low areas. Many of the poorly drained areas are used for pasture.

3. Paden-Bude-Henry Association

Nearly level to moderately sloping, moderately well drained to poorly drained soils that have a fragipan; on short side slopes and flat ridgetops that border flood plains

The major soils of this association are on flat ridgetops and short side slopes. The ridges are generally several miles long and less than one-half mile wide. The side slopes occur between the ridgetops and stream bottoms and commonly have a slope of less than 12 percent.

This association occupies about 6 percent of the county. About 50 percent of it is made up of Paden soils, 20 percent of Bude soils, 10 percent of Henry soils, and the remaining 20 percent of minor soils.

Paden soils are gently sloping and are moderately well drained. They occupy side slopes. Typically they have a surface layer of silt loam and a fragipan at a depth of about 22 inches.

Bude soils occupy ridgetops and are somewhat poorly drained. Typically they have a surface layer of silt loam and a fragipan at a depth of about 22 inches.

Henry soils occupy ridgetops and are poorly drained. Typically they have a surface layer of silt loam and a fragipan at a depth of about 20 inches.

The minor soils are Arkabutla, Leeper, Trinity, and Wehadkee. They occupy stream bottoms that are generally less than one-fourth mile wide.

Most of this association is cleared and is in row crops. The farms average about 80 acres in size. Corn, cotton, and soybeans are the dominant cash crops, and they are well suited to the ridgetops and stream bottoms. Interest in dairy farming and the raising of beef cattle has increased in recent years, and a number of farms are now used for such purposes (fig. 2).

Figure 2.—**Cattle grazing fescue on a Paden silt loam.**

4. Mantachie-Arkabutla-Rosebloom Association

Nearly level, somewhat poorly drained and poorly drained soils that have a fine sandy loam to silt loam subsoil; on wide stream bottoms

Soils of this association are on stream bottoms along the Tuscumbia River and next to Sevenmile and Chambers Creeks.

This association occupies about 22 percent of the county. About 35 percent is made up of Mantachie soils, 35 percent of Arkabutla soils, 15 percent of Rosebloom soils, and the remaining 15 percent of minor soils.

Mantachie soils are along the Tuscumbia River generally south of U.S. Highway 45. They are somewhat poorly drained. Typically they have a surface layer of fine sandy loam and a subsoil of mottled fine sandy loam and loam.

Arkabutla soils are on broad areas of the Tuscumbia River bottom generally north of U.S. Highway 45 and along Sevenmile and Chambers Creeks. They are somewhat poorly drained. Typically they have a surface layer of silt loam and a subsoil of mottled silt loam and heavy silt loam.

Rosebloom soils occupy low areas along the larger streams generally north of U.S. Highway 45. They are poorly drained. Typically they have a surface layer of silt loam underlain by a subsoil of gray silt loam.

The minor soils are in the Wehadkee series.

A large part of this association has been cleared and is used for row crops. The farms average about 100 acres in size. Cotton, corn, and soybeans are the dominant crops, and they grow moderately well. Many poorly drained areas that were once cleared have reverted to trees.

The most serious hazard is flooding by the Tuscumbia River, which overflows its banks four to eight times a year. The completion of the work planned for the watershed of the Tuscumbia River should eliminate this hazard.

5. Providence-Ora-Paden Association

Nearly level to strongly sloping, moderately well drained soils that have a fragipan; on ridgetops and side slopes

This soil association occurs on broad, nearly level and gently sloping ridges that are dissected by V-shaped creeks, branches, and draws, and on side slopes between the ridgetops and stream bottoms. The gradient of the side slopes is generally less than 17 percent. All of the soils are moderately well drained.

This association occupies about 20 percent of the county. About 50 percent is made up of Providence soils, 25 percent of Ora soils, 15 percent of Paden soils, and 10 percent of minor soils.

Providence soils are gently sloping and occupy side slopes. Typically they have a surface layer of silt loam and a subsoil of silty clay loam to loam. A fragipan is at a depth of about 24 inches.

Ora soils are strongly sloping and occupy side slopes. Typically they have a surface layer of fine sandy loam and a subsoil of clay loam to sandy loam. A fragipan is at a depth of about 18 inches.

Paden soils in this association are nearly level and occupy ridgetops. Typically they have a surface layer of silt loam and a subsoil of heavy silt loam to silty clay loam. A fragipan is at a depth of about 22 inches.

The minor soils are in the Shubuta and Tippah series.

Most areas of this association are cleared and have been in row crops at some time. The farms average about 90 acres in size and produce mostly cash crops. Corn, cotton, and soybeans are the chief crops grown. The soils on the ridgetops are well suited to these crops. The strongly sloping soils on side slopes, where the erosion hazard is severe, are well suited to pine trees.

6. Cahaba-Ruston Association

Dominantly steep and very steep, well-drained soils that have a sandy clay loam to sandy loam subsoil; mainly on ridgetops and side slopes

Soils of this association are on narrow, rolling ridgetops, on steep and very steep side slopes, and on stream bottoms. Many of the ridgetops are less than one-eighth mile wide. The side slopes are long and wide, and they generally have a slope of more than 17 percent. They occur between the ridgetops and stream bottoms. The stream bottoms are normally less than one-fourth mile wide. All of the soils are well drained.

This association occupies about 16 percent of the county. About 35 percent is made up of Cahaba soils, 25 percent of Ruston soils, and 40 percent of minor soils.

Cahaba soils are gently sloping to very steep and occupy the narrow ridgetops and upper slopes. Typically they have a surface layer of fine sandy loam and sandy loam. The subsoil is sandy clay loam to sandy loam.

Ruston soils are steep and occupy side slopes. Typically they have a surface layer of fine sandy loam and a subsoil of sandy clay loam to heavy sandy loam.

The minor soils are the Linker, Shubuta, and Mantachie.

Most of this association is made up of tree farms that are about 150 acres in size. Some of the larger areas on the ridgetops and stream bottoms are in row crops, mainly cotton, corn, and soybeans. Many steep side slopes have never been cleared. Most farmers earn a large part of their income away from the farm.

This association is generally well suited to pines and hardwoods. The ridgetops and stream bottoms are suited to crops, but erosion is a hazard on the ridgetops and overflow is a hazard on the stream bottoms.

Descriptions of the Soils

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

The procedure in this section is first to describe the soil series and then the mapping units in that series. Thus, to get full information on any one mapping unit, it is necessary to read the description of the unit and also the description of the soil series to which it belongs. As mentioned in the section "How This Survey Was Made," not all mapped areas are classified in soil series. For example, Gullied land is a miscellaneous land type

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

Soil	Acres	Percent
Arkabutla silt loam	19, 390	7. 5
Bude silt loam	3, 792	1. 5
Cahaba-Ruston association, hilly	35, 633	13. 8
Gullied land-Ruston complex, 8 to 40 percent slopes	29, 311	11. 3
Henry silt loam	2, 184	. 8
Leeper silty clay	500	. 2
Mantachie fine sandy loam	26, 453	10. 2
Ora fine sandy loam, 2 to 5 percent slopes, eroded	580	. 2
Ora fine sandy loam, 5 to 12 percent slopes, severely eroded	19, 386	7. 5
Ora-Shubuta complex, 8 to 12 percent slopes	4, 390	1. 7
Paden silt loam, 0 to 2 percent slopes	600	. 2
Paden silt loam, 2 to 5 percent slopes	10, 490	4. 1
Providence silt loam, 2 to 5 percent slopes, severely eroded	9, 000	3. 5
Providence silt loam, 5 to 8 percent slopes	1, 136	. 4
Providence silt loam, 5 to 8 percent slopes, severely eroded	25, 138	9. 7
Providence silt loam, heavy substratum, 2 to 5 percent slopes, severely eroded	537	. 2
Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	1, 565	. 6
Rosebloom silt loam	2, 235	. 9
Rosebloom-Arkabutla association, frequently flooded	6, 370	2. 5
Ruston fine sandy loam, 5 to 8 percent slopes	325	. 1
Ruston-Linker association, hilly	32, 660	12. 6
Ruston-Shubuta-Linker association, hilly	15, 665	6. 0
Shubuta loam, 2 to 5 percent slopes, eroded	310	. 1
Shubuta clay loam, 8 to 12 percent slopes, severely eroded	700	. 3
Sumter-Gullied land complex, 8 to 25 percent slopes	630	. 2
Sumter-Oktibbeha complex, 12 to 17 percent slopes, eroded	1, 350	. 5
Tippah-Providence complex, 2 to 8 percent slopes, severely eroded	1, 090	. 4
Trinity silty clay	645	. 2
Wehadkee-Mantachie association, frequently flooded	3, 040	1. 2
Wehadkee-Mantachie complex	4, 095	1. 6
Total	259, 200	100. 0

and does not belong to a soil series; nevertheless, it is described in alphabetic order along with the soil series.

An essential part of each soil series is a description of the soil profile, the sequence of layers beginning at the surface and continuing downward beyond the depth to which most plants penetrate. This profile is considered typical, or representative, for all soils of the series. If the profile for a given mapping unit differs from the typical profile, the differences are apparent in its description or in both the description and name of the mapping unit.

Each soil series contains a brief nontechnical and detailed technical description of the soil profile. The nontechnical description will be useful to most readers. The detailed technical description is included for soil scientists, engineers, and others who need to make thorough and precise studies of soils.

Listed at the end of each description of a mapping unit are the capability unit and woodland group in which the mapping unit has been placed. The page on which each capability unit and each woodland group is described can be found by referring to the "Guide to Mapping Units" at the back of this soil survey. Also, at the back of the survey, is a glossary that defines terms used in soil descriptions and in other descriptive material in the survey.

Arkabutla Series

The Arkabutla series consists of nearly level, somewhat poorly drained, strongly acid soils. These soils formed in loamy sediment washed from uplands.

Arkabutla soils are near Leeper, Mantachie, and Rosebloom soils. They are more acid and less clayey than Leeper soils. Their drainage is similar to that of Mantachie soils, but they contain less sand. Arkabutla soils are similar to Rosebloom soils in texture but have less distinct mottles at a depth between 10 and 30 inches.

Typical profile of Arkabutla silt loam in a hayfield, about 1 mile east of Oak Grove Church and 200 feet north of gravel road (SW¼SE¼ sec. 7, T. 3 S., R. 7 E.):

Ap—0 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; common fine roots; weak plowpan; a few organic stains; strongly acid; clear, smooth boundary.

A1—7 to 12 inches, dark yellowish-brown (10YR 4/4) silt loam; common, fine and medium, faint, pale-brown mottles; weak, fine, granular and subangular blocky structure; very friable; a few fine roots and a few fine pores; a few organic stains; very strongly acid; abrupt, smooth boundary.

B21—12 to 23 inches, grayish-brown (10YR 5/2) silt loam; many, medium, distinct, dark yellowish-brown (10YR 4/4) and pale-brown (10YR 6/3) mottles; weak, fine, granular and subangular blocky structure; friable; a few fine roots and a few fine pores; common, fine and medium, black and brown, soft concretions; very strongly acid; gradual, smooth boundary.

B22g—23 to 36 inches, gray (10YR 6/1) heavy silt loam; many, medium, distinct, dark yellowish-brown (10YR 4/4), brown (10YR 5/3), and strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; a few fine roots and a few fine pores; few, fine and medium, brown and black concretions; very strongly acid; gradual, smooth boundary.

B3g—36 to 58 inches, mottled gray (10YR 6/1) and yellowish-brown (10YR 5/8) heavy silt loam; weak, medium, subangular blocky structure; friable; a few fine pores and a few, fine, brown and black concretions; very strongly acid.

In the Ap horizon the color is 10YR in hue and ranges from 4 to 6 in value and from 2 to 4 in chroma. The A1 horizon is dominantly dark yellowish brown or yellowish brown and has a hue of 10YR. The B22g horizon is dominantly gray but in places is mottled with gray, grayish brown, brown, and yellowish brown. The B horizon is 45 to 55 percent silt and 18 to 35 percent clay. Less than 15 percent of this horizon is sand coarser than very fine sand. The B2 horizon ranges from silty clay loam to heavy silt loam in texture. A few to common, brown and black concretions occur throughout the profile. Reaction of these soils ranges from strongly acid to very strongly acid.

Arkabutla silt loam (Ar).—This somewhat poorly drained soil is on bottom lands throughout the county. Slopes are 0 to 2 percent.

The surface layer is brown to dark yellowish-brown silt loam about 12 inches thick. The subsoil is grayish-brown silt loam in the upper part and gray heavy silt loam in the lower part.

This soil is strongly acid to very strongly acid. The content of organic matter is small, and natural fertility is moderate. Water moves through the soil at a moderate rate. Runoff is medium, and the erosion hazard is slight in cultivated areas. The soil is easy to cultivate throughout a moderate range of moisture content. Flooding commonly occurs in winter and early in spring and occasionally during the growing season.

Included with this soil in mapping are small areas of Mantachie and Rosebloom soils. Also included are small areas of soils that are slightly acid to neutral.

Arkabutla silt loam is well suited to cotton, corn, soybeans (fig. 3), and pasture plants. Most areas are cultivated or are used for pasture, but a few areas are wooded. Capability unit IIw-1; woodland group 1.

Bude Series

The Bude series consists of nearly level, somewhat poorly drained soils that have a fragipan. These strongly acid soils formed in loamy material.

Bude soils are near Henry, Ora, and Paden soils. They are better drained than Henry soils and are siltier than Ora soils. They have mottles of chroma 2 or less in the upper 10 inches of the subsoil that are lacking in the Ora and Paden soils.

Typical profile of Bude silt loam in a wooded area about 1½ miles northeast of Kossuth on north side of State Highway No. 2 (NW¼SW¼ sec. 19, T. 2 S., R. 7 E.):

O1—½ inch to 0, leaf mold and litter.

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

A2—2 to 8 inches, mottled grayish-brown (10YR 5/2), dark yellowish-brown (10YR 3/4), and dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular and medium subangular blocky structure; friable; a few, fine, brown and black concretions; a few fine and coarse roots; strongly acid; clear, smooth boundary.

B21—8 to 16 inches, yellowish-brown (10YR 5/6) heavy silt loam; many, fine and medium, distinct, gray mottles; weak and moderate, medium, subangular blocky structure; friable; a few, fine, brown and black concretions and black coatings; strongly acid; gradual, wavy boundary.

B'22&A'2—16 to 22 inches, mottled light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/6) silt loam; weak, medium, subangular blocky structure; friable; strongly acid; gradual, wavy boundary.

B'x1—22 to 31 inches, mottled gray (10YR 6/1), yellowish-brown (10YR 5/6), gray (10YR 5/1), and strong-brown (7.5YR 5/6) silty clay loam; moderate, fine and medium, angular blocky and subangular blocky structure; firm, brittle, compact; common fine voids; common, fine, black coats; gray polygonal cracks filled with gray (10YR 6/1) silt; a few roots growing in cracks; strongly acid; gradual, wavy boundary.

B'x2—31 to 42 inches, mottled gray (10YR 5/1), yellowish-brown (10YR 5/6), strong-brown (7.5YR 5/6), and dark grayish-brown (10YR 4/2) silty clay loam; moderate, medium and coarse, subangular and angular blocky structure; firm, compact, brittle; common fine voids; clay films on peds; polygonal cracks filled with gray silty clay loam; strongly acid; diffuse boundary.

B'x3—42 to 55 inches +, yellowish-brown (10YR 5/6) silty clay loam; many, coarse, distinct, gray (10YR 5/1) and strong-brown (7.5YR 5/6) mottled; moderate, medium and coarse, subangular blocky and angular blocky structure; compact, brittle, firm; patchy clay films on peds; clay flow in voids and channels; polygonal cracks filled with gray (10YR 5/1) silty clay loam; a few fine roots in polygonal cracks; strongly acid.

In cultivated areas the Ap horizon is 10YR in hue and ranges from 4 to 5 in value and from 2 to 4 in chroma. The B21 horizon is dominantly yellowish brown but ranges to yellow. In the Bx horizon mottles are yellowish brown, brown, yellow, and shades of gray in hues of 7.5YR to 10YR. The B2 and Bx horizons range from loam to silty clay loam in texture. The upper part of the B and Bx horizons is 20 to 25 percent clay and 45 to 55 percent silt. Less than 15 percent of the sand is coarser than very fine sand. Generally the Bx horizon is several feet thick, the fragipan expression is moderate, and polygonal cracks and thick clay films are present. In places a few to many pebbles of small quartz are on the surface of these soils.

Bude silt loam (Bu).—This is the only Bude soil mapped in the county. It is somewhat poorly drained and has a fragipan and occurs throughout the county. Slopes are 0 to 2 percent.

The surface layer is dark grayish-brown and grayish-brown silt loam about 8 inches thick. The subsoil is mottled light brownish-gray and yellowish-brown silt loam, about 14 inches thick, in the upper part. It has a mottled gray, yellowish-brown, and dark grayish-brown silt loam to silty clay loam fragipan in the lower part.

This soil is strongly acid. The content of organic matter is low, and natural fertility is moderate. Water moves at a moderate rate through the upper part of the subsoil, but it moves slowly through the fragipan. The available water capacity is moderate. Runoff is slow, and erosion is a slight hazard in unprotected areas. Tilth is easily maintained by proper use of crop residues.

Included with this soil in mapping are small areas of Henry, Ora, and Paden soils.

Most areas of this soil are cultivated or pastured, but a small part is wooded. Cotton, corn, soybeans, and pasture plants are well suited. Capability unit IIIw-2; woodland group 5.

Figure 3.—Harvesting soybeans on Arkabutla silt loam. (Corn is growing on the same kind of soil in right background.)

Cahaba Series

The Cahaba series consists of sloping to steep, well-drained soils. These strongly acid soils formed in loamy material on uplands.

These soils are near Ruston soils in the eastern part of the county. Their surface and subsoil layers, combined, are thinner than those in Ruston soils.

Typical profile of Cahaba fine sandy loam, 5½ miles southeast of Corinth on the east side of a local gravel road (NW¼SW¼ sec. 9, T. 3 S., R. 8 E.):

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

A2—2 to 6 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; friable; many fine roots; strongly acid; clear, wavy boundary.

A3—6 to 10 inches, reddish-brown (5YR 4/4) sandy loam; weak, fine, subangular blocky structure; friable; patchy coating and bridging of sand grains; very strongly acid; clear, wavy boundary.

B2t—10 to 20 inches, red (2.5YR 4/6) sandy clay loam; weak, fine and medium, subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; clear, wavy boundary.

B3—20 to 36 inches, red (2.5YR 4/8) light sandy clay loam; weak, fine and medium, subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; clear, wavy boundary.

C—36 to 56 inches +, red (2.5YR 4/8) sandy loam to loamy sand; structureless; friable; very strongly acid.

In cultivated areas the Ap horizon is 10YR in hue and ranges from 4 to 5 in value and from 2 to 4 in chroma. The B2 and B3 horizons are dominantly yellowish red to red. Hues in these horizons are dominantly 2.5YR to 5YR but range to 10YR. The B2t horizon is less than 24 inches thick. It is dominantly sandy clay loam, but in places it ranges to loam or clay loam and becomes sandier as depth increases. This horizon is 18 to 35 percent clay. The B3 horizon is sandy clay loam to loamy sand. Reaction in these soils ranges from strongly acid to very strongly acid.

Cahaba-Ruston association, hilly (CrE).—This mapping unit is on rough, hilly uplands in the eastern part of the county. It is on long, winding ridges that have very steep side slopes broken by numerous drainageways. Most of the areas are forested. Slopes range from 12 to 40 percent. The composition of this unit is more variable than that of most others in the county but has been controlled well enough to interpret for the expected use of the soils concerned.

Cahaba soils make up about 34 percent of the acreage in this association, Ruston soils about 22 percent, and the minor Linker, Shubuta, and Mantachie soils about 44 percent. Proportions vary from place to place, however, and the percentage of Cahaba ranges from 18 to 50 percent and the percentage of Ruston from 10 to 34 percent. The pattern and extent of Cahaba and Ruston soils are fairly uniform throughout each mapped area. Each mapping unit contains these two major soils and generally one or more minor soils.

Included with this unit in mapping are a few eroded areas that were once cultivated. Also included are soils that have a less clayey subsoil than that in the Cahaba soils.

The well-drained Cahaba soils are on narrow ridgetops and upper slopes. They have a surface layer of very dark grayish-brown to dark-brown, friable fine sandy loam. It is less than 24 inches thick. The subsoil is red sandy clay loam. It is underlain by red to yellowish-red sandy loam to loamy sand. Reaction is very strongly acid in these soils. Natural fertility is low. Infiltration, permeability, and available water capacity are moderate.

The very steep, well-drained Ruston soils are on side slopes. They have a surface layer of very dark grayish-brown to yellowish-brown fine sandy loam. The subsoil is yellowish-red, thick sandy clay loam. Reaction is very strongly acid. Natural fertility is low. Infiltration, permeability, and available water capacity are moderate.

The well-drained Linker soils generally are on the middle and upper slopes and on sharp breaks above the heads of drainageways. They have a surface layer of dark grayish-brown to yellowish-brown sandy loam about 8 inches thick. The subsoil is yellowish-red to red sandy clay loam. It is underlain by sandstone at a depth of about 26 inches. Reaction is very strongly acid. Natural fertility is low. Available water capacity, infiltration, and permeability are moderate.

The moderately well drained and well drained Shubuta soils are on side slopes. These steep soils have a surface layer of strong-brown to dark-brown fine sandy loam. The subsoil is reddish-yellow to yellowish-red clay to clay loam. Below is mottled gray, red, and brown sandy clay to clay loam. Reaction is very strongly acid. Natural fertility is low. Available water capacity, infiltration, and permeability are moderate.

Most areas in this association have a cover of pines and hardwoods. The soils are not suited to cultivated crops or to pasture because of their very steep slopes but they are suited to trees. Runoff is very rapid, and the hazard of erosion is very severe. Capability unit VIIe-1; woodland group 9.

Gullied Land

Gullied land consists of sloping to steep soils so eroded that it is not economically feasible to reclaim them for row crops and pasture. The areas occur in the uplands throughout the county.

Texture ranges from sand to clay. A large part of the surface layer and much of the subsoil have eroded away. Many gullies cannot be crossed by farm equipment.

Natural fertility is low. Infiltration and permeability are variable, and available water capacity is low to moderate. Runoff is rapid.

Gullied land-Ruston complex, 8 to 40 percent slopes (GrE).—This mapping unit is on side slopes of ridges and on steep hillsides throughout the county. It ranges from 10 to 75 acres in size. Gullied land makes up about 40 percent of the acreage, Ruston soils about 40 percent, and Ora soils about 20 percent.

Gullied land consists of gullies that are 4 to 10 feet wide, 3 to 6 feet deep, and at least 50 feet apart. In most gullied areas the surface layer and subsoil have been removed by erosion, and only the parent material remains.

Ruston soils occur between the gullies. They have a yellowish-red sandy clay loam surface layer about 6 inches thick. The subsoil is yellowish-red clay loam that extends to a depth of about 26 inches. Below is yellowish-red sandy loam or sandy clay loam. These soils are strongly acid to very strongly acid.

Ora soils also occur between the gullies. They have a yellowish-brown loam surface layer about 6 inches thick. The subsoil is yellowish-red loam to sandy clay loam that extends to a depth of about 26 inches. Below is a fragipan of mottled yellowish-brown, strong-brown, and gray loam. These soils are strongly acid.

Most areas of this mapping unit have been cultivated in the past but are now idle. Pine trees have been planted in some areas, but because of poor tilth, rapid runoff, and

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low moisture supply, they are difficult to establish. Trees and medium to tall grasses grow moderately well on Ruston and Ora soils. The Gullied land areas have a sparse cover of grasses and trees. This complex is not suited to row crops or pasture. Capability unit VIIe-2; woodland group 10.

Henry Series

The Henry series consists of nearly level, strongly acid soils that have a fragipan. These poorly drained soils formed in loamy material.

Henry soils are near Bude soils. They are more poorly drained than Bude soils and have a thicker and grayer subsurface layer.

Typical profile of Henry silt loam in a wooded area, 1 mile north of Suitors Crossing, one-fifth mile east of Gift School, and north of gravel road (NW¼SW¼ sec. 35, T. 1 S., R. 6 E.):

Apg—0 to 3 inches, gray (10YR 6/1) silt loam; common, fine, distinct, yellowish-brown mottles; weak, fine and medium, granular structure; friable; common, fine and medium roots and a few coarse roots; strongly acid; clear, smooth boundary.

A21g—3 to 7 inches, gray (10YR 6/1) silt loam; many, medium and coarse, distinct, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/6) mottles; weak, fine, granular and subangular blocky structure; friable; a few, medium, brown and black concretions; common, fine and medium roots and a few coarse roots; strongly acid; clear, smooth boundary.

A22g—7 to 15 inches, gray (10YR 6/1) silt loam that has high content of fine sand; many, fine and medium, distinct, yellowish-brown and brown mottles; weak, medium, subangular blocky structure; friable, slightly compact, brittle; common, fine and medium, brown and black concretions; strongly acid; common fine vesicles; clear, wavy boundary.

A23g—15 to 20 inches, light brownish-gray (10YR 6/2) silt loam that has high content of fine sand; common, fine, distinct, dark yellowish-brown and yellowish-brown mottles; weak, fine and medium, subangular blocky structure; slightly firm, brittle, compact; many fine vesicles; common, fine and medium, brown and black concretions; light-gray (10YR 7/1) coats of silt around peds and in cracks; a few fine and medium roots; very strongly acid; clear, wavy boundary.

Bx1—20 to 33 inches, mottled light brownish-gray (10YR 6/2) and gray (10YR 5/1) silty clay loam; yellowish-brown (10YR 5/6) mottles in about 15 percent of this horizon; moderate, medium and coarse, subangular and angular blocky structure; firm, compact, brittle; polygonal cracks about 4 inches apart that are filled with gray (10YR 5/1) heavy silty clay loam and have a few fine roots; thick clay films on the faces of many peds; pockets of gray (10YR 6/1) silt loam inside peds; a few, fine, brown and black concretions; very strongly acid; gradual, wavy boundary.

Bx2—33 to 48 inches, mottled gray (10YR 6/1), yellowish-brown (10YR 5/6), and dark yellowish-brown (10YR 4/4) heavy silt loam; moderate, medium, subangular and blocky structure; firm, compact, brittle; polygonal cracks filled with gray (10YR 5/1) silty clay loam; patchy clay films on faces of peds; a few fine voids that have been filled with clay; common, fine and medium, brown and black concretions; very strongly acid; gradual, wavy boundary.

Bx3—48 to 55 inches +, yellowish-brown (10YR 5/6) heavy loam; many, medium, distinct, gray mottles and many, medium, faint, strong-brown mottles; moderate, medium and coarse, angular blocky structure; firm, compact, brittle; polygonal cracks that are filled with gray (10YR 5/1) silty clay loam; patchy clay films on faces of peds; a few voids that have been filled with clay; a few, fine, brown and black concretions; coats of gray silt in cracks and on faces of some peds; very strongly acid.

The Ap horizon is 10YR in hue and ranges from 4 to 6 in value and from 1 to 3 in chroma. In the upper 20 inches of the B horizon, the clay content is more than 18 percent and the silt content ranges from 55 to 65 percent. Less than 15 percent of this part of the B horizon is sand coarser than very fine sand. The Bx horizon ranges from loam to silty clay loam but is dominantly heavy silt loam. It is dominantly gray and 10YR in hue and has brown mottles. The degree of fragipan expression is moderate to strong. Fine brown and black concretions are present in the profile, and in places a few small quartz pebbles are present.

Henry silt loam (He).—This is the only Henry soil mapped in the county. It is poorly drained and is in the central part of the county. Slopes are 0 to 2 percent.

The surface layer is gray silt loam about 3 inches thick. It is underlain by gray silt loam that is mottled with strong brown, brown, yellowish brown, and dark yellowish brown. The subsoil, a fragipan, is at a depth of about 20 inches. It is mottled gray to light brownish-gray loam to silty clay loam.

This soil is strongly acid. The content of organic matter is small, and natural fertility is low. Water moves slowly through the fragipan. Runoff is very slow, and available water capacity is moderate.

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

Henry silt loam is suited to pasture plants and trees. Most areas are wooded, but some small areas are cultivated or are used for pasture. Capability unit IVw-1; woodland group 5.

Leeper Series

The Leeper series consists of nearly level, neutral to alkaline, somewhat poorly drained soils. These clayey soils formed on alluvium.

Leeper soils are near Arkabutla, Trinity, and Wehadkee soils. They are similar to Arkabutla soils, but they are neutral to alkaline and contain more clay at a depth between 10 and 40 inches. Leeper soils lack the thick surface layer of Trinity soils. They have slightly better drainage than Wehadkee soils and contain more clay at a depth between 10 and 40 inches.

Typical profile of Leeper silty clay in a 15-acre cultivated area, approximately 3 miles west of Corinth on north side of Smith Bridge Road (NW¼SE¼ sec. 31, T. 1. S., R. 7 E.):

Ap1—0 to 2 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, fine and medium, granular structure; friable; common fine roots; mildly alkaline; calcareous; clear, smooth boundary.

Ap2—2 to 8 inches, dark grayish-brown (2.5Y 4/2) silty clay; moderate, fine and medium, subangular blocky and angular blocky structure; firm; apparent plowpan; common fine roots; mildly alkaline; calcareous; clear, wavy boundary.

B21—8 to 15 inches, dark grayish-brown (10YR 4/2) silty clay; common, medium, faint, gray mottles; moderate, fine and medium, subangular and angular blocky structure; common fine roots; pressure faces on some ped surfaces; firm, plastic, and sticky; some mixing of Ap and B21 materials in root channels and cracks; mildly alkaline; calcareous; clear, smooth boundary.

B22g—15 to 36 inches, mottled gray (N 6/0) and strong-brown (7.5YR 5/6) silty clay; massive in place, but breaks to weak and moderate, medium, subangular blocky and angular blocky peds; firm, plastic, and sticky; a few fine roots; pressure faces on some ped faces; some mixing of Ap and B22g materials in root channels and cracks; a few, fine, black concretions; mildly alkaline; noncalcareous; clear, smooth boundary.

Cg—36 to 50 inches +, mottled gray (N 6/0) and strong-brown (7.5YR 5/6) silty clay; massive; firm, plastic, and sticky; a few slickensides that do not intersect; mildly alkaline; noncalcareous.

The A horizon is mainly silty clay in texture. In the Ap horizon color is 10YR and 2.5Y in hue and ranges from 3 to 5 in value and from 1 to 3 in chroma. Where the value is 3, the thickness of the Ap horizon is less than 10 inches. The Bg horizon is mottled with shades of gray and brown. Depth to the mottled layer ranges from 12 to 18 inches. A few to many brown and black concretions occur in the profile. Clay content ranges from 35 to 45 percent and silt content from 55 to 60 percent. Reaction of these soils ranges from neutral to moderately alkaline.

Leeper silty clay (Le).—This is the only Leeper soil mapped in the county. It is somewhat poorly drained and is in the north-central part of the county on flood plains. Slopes are 0 to 2 percent.

The surface layer is dark grayish-brown silty clay about 8 inches thick. The subsoil is dark grayish-brown silty clay, about 7 inches thick, in the upper part, and mottled gray and strong-brown silty clay in the lower part. It is underlain by mottled strong-brown and gray silty clay.

This soil is neutral to mildly alkaline. The content of organic matter and natural fertility are moderate. Water moves slowly through this soil, and available water capacity is high. Tilth is fairly good. Runoff is slow, and the erosion hazard is slight in cultivated areas. Flooding occurs in winter, but it seldom occurs during the growing season.

Included with this soil in mapping are small areas of Trinity silty clay.

Leeper silty clay is well suited to cotton, corn, soybeans, and pasture plants. Most areas are cultivated or are used for pasture. Capability unit IIIw-3; woodland group 2.

Linker Series

In the Linker series are steep, strongly acid and very strongly acid soils. These well-drained soils formed in loamy material on uplands.

Linker soils are near Ruston and Shubuta soils. They are similar to the Ruston soils but have sandstone at a depth of 26 to 34 inches. Their subsoil contains less clay than that of Shubuta soils.

In this county Linker soils are mapped only with Ruston and Shubuta soils. A description of Ruston and of Shubuta soils is provided under the Ruston and Shubuta series, respectively.

Typical profile of Linker fine sandy loam in a wooded area, 10 miles west of Corinth on the south side of a local road (SE¼NW¼ sec. 13, T. 2 S., R. 5 E.):

A1—0 to 1 inch, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; friable; many fine roots; very strongly acid; clear, wavy boundary.

A2—1 to 8 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; friable; a few iron crusts as much as 2 inches in diameter; very strongly acid; clear, wavy boundary.

B21t—8 to 14 inches, yellowish-red (5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; patchy clay films; sand grains coated and bridged with clay; iron crusts 2 inches in diameter; very strongly acid; clear, wavy boundary.

B22t—14 to 26 inches, yellowish-red (5YR 4/6) sandy clay loam; moderate and medium subangular blocky structure; friable; clay films on ped faces; abrupt, smooth boundary.

R—26 inches +, iron-bearing platy layers of sandstone that range from 1 to several feet in thickness.

In the A horizon color is 10YR in hue and ranges from 4 to 6 in value and from 1 to 4 in chroma. The Bt horizon color is dominantly yellowish red in hue of 5YR, but it ranges to strong brown in hue of 7.5YR. The B horizon is 20 to 30 percent clay in the upper 20 inches, 15 to 25 percent silt, and 50 to 60 percent sand. The R horizon is at a depth of 26 to 34 inches. It consists of layers of sandstone that range from 1 to 3 feet in thickness. In places layers of soil 2 to 4 inches thick are between the layers of sandstone.

Mantachie Series

The Mantachie series consists of strongly acid, somewhat poorly drained soils. These soils formed in loamy material washed from sandy to loamy soils of the uplands.

Mantachie soils are near Arkabutla, Trinity, and Wehadkee soils. They are similar to Arkabutla but contain more than 15 percent sand coarser than very fine sand. They are sandier at a depth between 10 and 40 inches than Trinity soils and have slightly better drainage than Wehadkee soils.

Typical profile of Mantachie fine sandy loam in a large soybean field, 1 mile east of Rienzi, north of State Highway 356, and 15 feet north of a light pole (SW¼SW¼ sec. 36, T. 4 S., R. 7 E.):

Ap—0 to 8 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; fine, granular structure; friable; a few fine roots; strongly acid; abrupt, smooth boundary.

B1—8 to 16 inches, brown (10YR 4/3 fine sandy loam; common, medium, distinct, grayish-brown mottles; weak, fine, granular structure; friable; a few fine roots; strongly acid; a few, fine, black coatings; clear, wavy boundary.

B2g—16 to 28 inches, mottled gray (10YR 6/1), grayish-brown (10YR 5/2), and yellowish-brown (10YR 5/4) loam; weak to moderate, fine and medium, subangular blocky structure; friable; a few, fine, brown and black concretions; strongly acid; clear, wavy boundary.

Cg—28 to 52 inches, gray (10YR 6/1) loam; common, fine, distinct, brown mottles; structureless; friable; common dark-brown and black splotches; a few pockets of sandy clay loam; strongly acid.

The Ap horizon is 10YR in hue and ranges from 4 to 5 in value and from 1 to 6 in chroma. The B horizon is more than 18 percent clay and more than 15 percent sand coarser than very fine sand at a depth between 10 and 40 inches. Depth to the mottled layer ranges from 10 to 18 inches. The B and Cg horizons range from sandy clay loam to fine sandy loam in texture. A few to common, small, brown and black concretions occur in these horizons. Reaction ranges from strongly acid to very strongly acid in these soils.

Mantachie fine sandy loam (Mh).—This soil is somewhat poorly drained. It occurs on bottom lands throughout the county. Slopes are 0 to 2 percent.

The surface layer is dark yellowish-brown fine sandy loam about 8 inches thick. The upper part of the subsoil is brown fine sandy loam, and it is mottled with grayish brown. The lower part is mottled gray, yellowish-brown, and grayish-brown loam. The subsoil is underlain by mottled gray, yellowish-brown, and grayish-brown loam.

This soil is strongly acid. The content of organic matter is small, and the natural fertility is moderate. Water moves through the soil at a moderate rate. Runoff is medium, and the hazard of erosion is slight. The soil is easy to cultivate throughout a moderate range of moisture content. Flooding occurs in winter, but it generally does not occur during the growing season.

Included with this soil in mapping are small areas of soils that are better drained than Mantachie fine sandy loam and lack mottles that have a chroma of 2 at a depth between 0 and 20 inches. Also included are areas of soils that have a sandy subsoil.

Mantachie fine sandy loam is well suited to cotton, corn, soybeans, and pasture plants. About 75 percent of this soil is cultivated or used for pasture. The rest is wooded. Capability unit IIw–1; woodland group 3.

Oktibbeha Series

The Oktibbeha series consists of sloping and strongly sloping, moderately well drained to well drained soils. These clayey soils formed in fine-textured material on uplands.

Oktibbeha soils are near Sumter soils. They are redder and more acid than Sumter soils.

In this county Oktibbeha soils are mapped only in a complex with Sumter soils. A description of Sumter soils is provided under the Sumter series.

Typical profile of Oktibbeha silty clay on 12 to 17 percent slopes about 2 miles west of Corinth and north of the junction of U.S. Highway 72 and State Highway 2 (SE¼SW¼ sec. 4, T. 2 S., R. 7 E.):

Ap—0 to 2 inches, very dark grayish-brown (10YR 3/2) silty clay; weak, fine and medium, granular structure; friable, plastic; common fine roots; medium acid; clear, wavy boundary.

B21t—2 to 12 inches, dark-red (2.5YR 3/6) clay; strong, fine, subangular and angular blocky structure; firm, plastic; a few fine roots; medium acid; clear, smooth boundary.

B22t—12 to 30 inches, mottled yellowish-red (5YR 4/6), grayish-brown (2.5Y 5/2), and light yellowish-brown (2.5Y 6/4) clay; moderate, fine, subangular and angular blocky structure; firm, plastic; a few fine roots; clay film on pressure faces of peds; medium acid; gradual, smooth boundary.

B3—30 to 40 inches, mottled light yellowish-brown (2.5Y 6/4) and light-gray (10YR 7/1) clay; moderate to strong, medium, subangular and angular blocky structure; firm, plastic; neutral; a few calcium carbonate concretions; gradual, wavy boundary.

IIC—40 to 55 inches +, mottled olive (5Y 5/6) and light-gray (5Y 7/1) marly clay; massive; very firm, plastic; many fine lime concretions; calcareous.

The Ap horizon is 10YR in hue and ranges from 3 to 5 in value and from 2 to 4 in chroma. The B horizon is dominantly clay in texture. The upper part ranges in color from dark red in hue of 2.5YR to yellowish red in hue of 5YR. Mottles that have a chroma of 2 or less occur in places at a depth below the upper 10 inches in the B horizon. The C horizon is marly clay and is at a depth of 36 inches or more. In the solum, reaction ranges from slightly acid to strongly acid in the upper part to neutral in the lower part.

Ora Series

The Ora series consists of nearly level to strongly sloping, very strongly acid to extremely acid soils that have a fragipan. These moderately well drained soils formed in loamy material.

Ora soils are near the Bude, Paden, Providence, and Ruston soils. They contain less silt than Bude soils and have less distinct mottles in the upper 10 inches of the subsoil. They lack the silty upper solum typical of Paden soils. Ora soils lack the silty upper solum and layer of contrasting material typical of Providence soils, and unlike them have a base saturation of less than 35 percent. They differ from Ruston soils in having a fragipan.

Typical profile of Ora fine sandy loam, 2 to 5 percent slopes, eroded, in a cottonfield about 3½ miles south of Glen on east side of local road (NW¼NW¼ sec. 19, T. 3 S., R. 9 E.):

Ap—0 to 5 inches, yellowish-brown (10YR 5/6) fine sandy loam; weak, fine, granular structure; friable; many fine roots and a few medium roots; very strongly acid; clear, wavy boundary.

B21t—5 to 10 inches, strong-brown (7.5YR 5/6) clay loam; moderate, fine and medium, subangular blocky structure; friable; common fine roots; roots and wormholes in upper part of this horizon contain some material from Ap horizon; sand grains coated and bridged with clay; very strongly acid; abrupt, wavy boundary.

B22t—10 to 18 inches, yellowish-red (5YR 4/8) clay loam; moderate, fine and medium, subangular blocky structure; friable; many fine roots; a few fine pores; patchy clay films; sand grains bridged with clay; very strongly acid; clear, wavy boundary.

Bx1—18 to 26 inches, yellowish-red (5YR 4/8) loam; common, medium, distinct, yellowish-brown, strong-brown, and light brownish-gray mottles; weak, fine and medium, subangular blocky structure; friable, compact, brittle; a few fine voids; patchy clay films; sand grains bridged with clay; extremely acid; abrupt, wavy boundary.

Bx2—26 to 38 inches, mottled yellowish-red (5YR 4/8), strong-brown (7.5YR 5/6), yellowish-brown (10YR 5/8), and light brownish-gray (10YR 6/2) light sandy clay loam; moderate, fine and medium, subangular blocky structure; firm, compact, brittle; common fine voids; patchy clay films; polygonal seams filled with gray sandy loam in places; extremely acid; gradual, wavy boundary.

Bx3—38 to 45 inches, mottled red (2.5YR 4/8), yellowish-brown (10YR 5/8), and light brownish-gray (10YR 6/2) sandy loam; weak, fine and medium, subangular blocky structure; friable, slightly compact, slightly brittle; a few patchy clay films; a few vertical cracks filled with light brownish-gray sandy loam; extremely acid; clear, wavy boundary.

B31t—45 to 58 inches, red (2.5YR 4/8) sandy loam; a few, fine, distinct, yellowish-brown mottles; weak, fine and medium, subangular blocky structure; friable; a few patchy clay films; very strongly acid; gradual, wavy boundary.

B32t—58 to 65 inches, red (2.5YR 4/8) sandy loam; common, medium, distinct, yellowish-brown and light-gray mottles; weak, fine and medium, subangular blocky structure; friable; sand grains coated and bridged with clay; extremely acid.

The Ap horizon is 10YR in hue and ranges from 4 to 6 in value and from 2 to 6 in chroma. In the upper 20 inches of the B horizon, the clay content ranges from 18 to 35 percent and the silt content from 30 to 45 percent. More than 15 percent of the total sand in this part of the B horizon is coarser than very fine sand. The B2t horizon ranges from loam to clay loam but is dominantly clay loam. It is dominantly yellowish red in color, but it ranges from yellowish red to strong brown in hues of 7.5YR to 5YR. The Bx horizon is a sandy clay loam to sandy loam. The degree of fragipan expression is weak to moderate. In many places fine, soft, black and brown concretions are in the Bx horizon. In places a few round quartz pebbles and platy ironstone fragments occur on the surface and throughout the profile.

Ora fine sandy loam, 2 to 5 percent slopes, eroded (OaB2).—This soil has the profile described as typical for the series. It is moderately well drained and occurs on ridgetops throughout the county. Most areas are marked by shallow gullies and rills.

The surface layer is yellowish-brown fine sandy loam about 5 inches thick. The upper part of the subsoil is strong-brown and yellowish-red clay loam. The middle part of the subsoil, at a depth of about 18 inches, is a mottled red, brown, and gray fragipan. This fragipan ranges from sandy loam to light sandy clay loam in texture. The lower part of the subsoil, at a depth of about 45 inches, is red sandy loam.

This soil is strongly acid. Natural fertility and available water capacity are moderate. Water moves through the upper part of the subsoil at a moderate rate but slowly through the fragipan. Runoff is medium, and the erosion hazard is moderate in cultivated areas. Tilth is easy to maintain, and the soil can be worked throughout a wide range of moisture content without clodding and crusting.

Included with this soil in mapping are small areas of Paden, Providence, and Ruston soils. Also included are a few small areas of Shubuta soils.

Most areas of this Ora soil are used for row crops or pasture. Cotton, corn, soybeans, and pasture plants grow moderately well if moderate amounts of fertilizer are applied. Capability unit IIe–1; woodland group 6.

Ora fine sandy loam, 5 to 12 percent slopes, severely eroded (OaD3).—This moderately well drained soil is on side slopes and sharp breaks near ridgetops. It occurs throughout the county. The areas are marked by gullies and rills.

The present surface layer is light yellowish-brown fine sandy loam and consists mainly of material formerly in the subsoil. It is underlain by strong-brown clay loam to clay. A fragipan of mottled red, brown, and gray loam to sandy loam is at a depth of 14 to 24 inches.

This soil is strongly acid. Natural fertility and available water capacity are moderate. Water moves through the upper part of the subsoil at a moderate rate, but it moves slowly through the fragipan. The hazard of further erosion is severe.

Included with this soil in mapping are small areas of Paden, Providence, Ruston, and Shubuta soils.

Most areas of this Ora soil were cleared and cultivated at some time but are now in pasture and woodland. Pasture plants grow well if moderate amounts of fertilizer are applied. Capability unit VIe–2; woodland group 8.

Ora-Shubuta complex, 8 to 12 percent slopes (OsD).—This mapping unit is on short, choppy hills. Ora soils make up about 55 percent of the acreage, and Shubuta soils about 35 percent. The rest consists of Ruston and other minor soils.

The Ora soils in this complex have a loam to silt loam surface layer about 8 inches thick. The subsoil is yellowish-red clay loam in the upper part and has a mottled fragipan about 7 inches thick in the lower part. These soils generally are on ridgetops and upper side slopes.

The Shubuta soils have a fine sandy loam surface layer about 7 inches thick and a red, clayey subsoil. They occupy middle and lower slopes.

All of these soils are strongly acid. Natural fertility is low to moderate, infiltration is slow, and permeability is moderate to slow. Available water capacity is moderate. Runoff is rapid, and erosion is a hazard.

About three-fourths of the acreage of this mapping unit is cutover forest. Most of the cleared acreage is in pasture.

These soils are well suited to pine trees and pasture plants. The strong slopes and erosion hazard make these soils poorly suited to row crops. Capability unit VIe–2; woodland group 9.

Paden Series

The Paden series consists of nearly level to gently sloping, very strongly acid soils that have a fragipan. These moderately well drained soils formed in loamy material.

Paden soils are near Bude, Ora, and Providence soils. They have less mottles in the upper 10 inches of the subsoil than Bude soils. Their fragipan is more strongly expressed than that in Ora soils, and unlike the Ora soils, more than 15 percent of the sand in the fragipan is coarser than very fine sand. Paden soils differ from Providence soils in having less clay in the upper part of the subsoil.

Typical profile of Paden silt loam, 2 to 5 percent slopes, in a 10-acre cottonfield, 3 miles southwest of Corinth and 50 feet north of a local gravel road (SE¼NW¼ sec. 19, T. 2 S., R. 7 E.):

Ap—0 to 6 inches, dark-brown (10YR 4/3) silt loam that has a high sand content; weak, thick, platy structure that breaks to weak, fine, subangular blocky and granular; friable; common fine roots; a few, dark-brown, organic stains; strongly acid; abrupt, smooth boundary.

B21—6 to 12 inches, yellowish-brown (10YR 5/6) heavy silt loam to silty clay loam; weak to moderate, fine and medium, subangular blocky structure; friable; a few, fine, brown concretions; very strongly acid; gradual, wavy boundary.

B22—12 to 19 inches, yellowish-brown (10YR 5/6) heavy silt loam; common, fine, distinct, pale-brown mottles; weak to moderate, fine and medium, subangular blocky structure; friable; a few to common, fine and medium, brown concretions; very strongly acid; clear, wavy boundary.

A'2&B—19 to 22 inches, light-gray (10YR 7/1 to 10YR 6/1) silt loam, 30 percent of which is yellowish-brown (10YR 5/6) and pale-brown (10YR 6/3) remnants of material from the B horizon that are gray coated; weak, thin, platy structure; friable, slightly compact, brittle; a few to common, fine, brown concretions; very strongly acid; clear, wavy boundary.

B'x1—22 to 31 inches, mottled yellowish-brown (10YR 5/6), strong-brown (7.5YR 5/6), and gray (7.5YR 5/6) silty clay loam; moderate, medium and coarse, subangular and angular blocky structure; firm, compact, brittle; thick, continuous, clay films; polygonal cracks 4 inches apart filled with gray silty clay loam extending down through lower horizons; gray silt around peds; a few, fine, brown concretions; very strongly acid; gradual, wavy boundary.

IIB'x2—31 to 48 inches, mottled yellowish-brown (10YR 5/6), pale-brown (10YR 6/3), light brownish-gray (10YR 6/2), and strong-brown (7.5YR 5/6) silt loam to loam; moderate, medium and coarse, subangular and angular blocky structure; firm, compact, brittle; thick, continuous clay films; a few fine voids; a few, fine, brown concretions; very strongly acid; gradual, wavy boundary.

IIB'x3—48 to 65 inches, mottled yellowish-brown (10YR 5/6), gray (10YR 6/1), and pale-brown (10YR 6/3) loam to silt loam; weak, coarse, subangular and angular blocky structure; firm, compact, brittle; a few, fine, brown concretions; patchy clay films; sand grains coated and bridged with clay; polygonal gray seams extend downward.

In the Ap horizon the color is 10YR in hue, or yellower, and ranges from 4 to 6 in value and from 3 to 5 in chroma. The B2 horizon is dominantly yellowish brown in hue of 10YR and ranges from silty clay loam to heavy silt loam. It is 18 to 35 percent clay and less than 20 percent sand in the upper 12 inches. The A'2&B horizon ranges from gray to yellowish brown in color and from loam to silt loam in texture. The B'x horizon is distinctly to prominently mottled with shades of gray, brown, yellow, and red. The texture is dominantly silt loam or loam, but it ranges from silt loam to silty clay loam. The content of clay and sand is similar to that in the B2 horizon, but more than 15 percent of the sand is coarser than very fine sand. Depth to the fragipan ranges from 15 to 25 inches. Concretions in the profile range from black to brown and from a few to many. In places a few small quartz pebbles are present on the surface and throughout the profile.

Paden silt loam, 0 to 2 percent slopes (PaA).—This moderately well drained soil occurs throughout the county.

The surface layer is brown silt loam about 6 inches thick. The subsoil is yellowish-brown heavy silt loam in the upper part. It has a fragipan of mottled brown, gray, and yellowish-brown silty clay loam to silt loam at a depth of about 22 inches.

This soil is strongly acid. The content of organic matter is small, and natural fertility is moderate. Water moves through the upper part of the subsoil at a moderate rate, but it moves slowly through the fragipan. The available water capacity is moderate. Runoff is medium. Tilth is easily maintained by proper use of crop residues.

Included with this soil in mapping are small areas of Bude silt loam.

Most of this Paden soil is cultivated or is in pasture. Cotton, corn, soybeans, and pasture plants are suited. Capability unit IIw-3; woodland group 7.

Paden silt loam, 2 to 5 percent slopes (PaB).—This soil has the profile described as typical for the series. It is moderately well drained and occurs on ridgetops in the central part of the county.

The surface layer is dark-brown silt loam about 6 inches thick. The subsoil is yellowish-brown silty clay loam in the upper part. It has a thick fragipan of mottled brown, yellowish-brown, and gray silty clay loam to loam at a depth of about 22 inches.

This soil is very strongly acid. The content of organic matter is small, and natural fertility is moderate. Water moves through the upper part of the subsoil at a moderate rate, but it moves slowly through the fragipan. Available water capacity is moderate. Runoff is medium, and the erosion hazard is moderate in cultivated areas.

Included with this soil in mapping are small areas of Bude silt loam and small areas of Ora and Providence soils. Also included are small areas of eroded soils that have a few rills and shallow gullies.

This Paden soil is moderately well suited to cotton, corn, and soybeans but is well suited to pasture. Most areas are cultivated. Capability unit IIe-2; woodland group 7.

Providence Series

The Providence series consists of gently sloping to moderately sloping, moderately well drained soils that have a fragipan. These very strongly acid to strongly acid soils formed in loamy material.

The Providence soils occur with the Ora, Paden, Shubuta, and Tippah soils. Unlike Ora soils, Providence soils contain a layer of contrasting material and are less than 15 percent sand coarser than very fine sand. Providence soils have more clay in the upper part of the subsoil than Paden soils. They are similar to the Shubuta soils, but they have a fragipan. Also, the upper part of the subsoil contains more silt.

Typical profile of Providence silt loam, 5 to 8 percent slopes, in a wooded area east of U.S. Highway 45 on local paved road, 5 miles south of Corinth (NW¼SW¼ sec. 10, T. 3 S., R. 7 E.):

Ap—0 to 6 inches, pale-brown (10YR 6/3) silt loam; weak, fine, granular structure; very friable; common fine roots; very strongly acid; abrupt, smooth boundary.

B21t—6 to 9 inches, yellowish-red (5YR 5/8) silty clay loam; weak, fine, subangular blocky structure; friable; common fine roots; clay films on ped faces; root channels and worm channels filled with material from Ap horizon; very strongly acid; abrupt, smooth boundary.

B22t—9 to 17 inches, yellowish-red (5YR 5/8) silty clay loam; moderate, fine and medium, subangular blocky structure; friable to firm; a few fine roots; clay films on ped faces; a few old root holes and worm channels filled with material from Ap and B21t horizons; very strongly acid; clear, smooth boundary.

B23t—17 to 24 inches, yellowish-red (5YR 5/8) silt loam; many, coarse, distinct, yellow (10YR 7/8) mottles; moderate, medium and coarse, angular blocky structure; friable; a few fine roots; clay films on ped faces; very strongly acid; gradual, wavy boundary.

IIBx1—24 to 42 inches, mottled, yellowish-red (5YR 5/8), yellow (10YR 7/8), and light-gray (10YR 7/2) loam; moderate, medium and coarse, subangular blocky structure; firm, compact, brittle; a few fine roots; polygonal seams filled with gray silt loam; very strongly acid; gradual, wavy boundary.

IIBx2—42 to 50 inches, mottled, yellowish-red (5YR 5/8), yellow (10YR 7/8), and light-gray (10YR 7/2) light clay loam; moderate, medium, subangular blocky structure; firm, compact, brittle; clay films on peds; strongly acid.

Typical profile of Providence silt loam, heavy substratum, 2 to 5 percent slopes, severely eroded, in a wooded area on west side of local road, 1 mile west of Corinth and 1/5 mile south of Calvary Baptist Church (SE¼NW¼ sec. 9, T. 2 S., R. 7 E.):

Ap—0 to 3 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, granular structure; friable; many fine roots and a few medium roots; very strongly acid; clear, smooth boundary.

B1—3 to 7 inches, yellowish-brown (10YR 5/6) silt loam; weak, fine and medium, subangular blocky structure; friable; common, fine roots and a few medium and coarse roots; a few fine pores; very strongly acid; clear, smooth boundary.

B21t—7 to 14 inches, reddish-brown (5YR 4/4) light silty clay loam; a few, fine, faint, yellowish-brown mottles; moderate, medium, subangular blocky structure; friable to firm; clay films on ped faces; root holes and worm holes filled with material from the Ap horizon; a few fine to coarse roots; fine organic veins and stains; very strongly acid; clear, smooth boundary.

B22t—14 to 23 inches, reddish-brown (5YR 4/4) silty clay loam; moderate, fine and medium, subangular blocky and angular blocky structure; friable to firm; a few fine and coarse roots; clay films on aggregate faces; very strongly acid; gradual, smooth boundary.

B23t—23 to 26 inches, reddish-brown (5YR 4/4) silty clay loam; a few, fine, distinct, yellowish-brown and light-gray mottles; moderate, fine and medium, subangular blocky and angular blocky structure; friable to firm; a few fine and coarse roots; clay films on peds; a few black splotches; very strongly acid; clear, wavy boundary.

Bx1—26 to 34 inches, mottled reddish-brown (5YR 4/4), yellowish-brown (10YR 5/4), light-gray (10YR 7/2), and brownish-yellow (10YR 6/8) silt loam; moderate, fine and medium, subangular blocky structure; firm, compact, brittle; a few black splotches; a few fine voids; reddish-brown clay films on peds; a few polygonal seams filled with light-gray (10YR 7/2) silty clay loam; very strongly acid; gradual, wavy boundary.

IIBx2—34 to 46 inches, mottled reddish-brown (5YR 4/4), light-gray (10YR 7/2), yellowish-brown (10YR 5/4), and brownish-yellow (10YR 6/8) loam; moderate, coarse, platy structure; firm, compact, brittle; many fine voids; reddish-brown clay films on peds; a few polygonal cracks filled with gray silty clay loam; light-gray silt coats; very strongly acid; gradual, wavy boundary.

IIB3t—46 to 60 inches, mottled red (2.5YR 4/6) and strong-brown (7.5YR 5/6) silty clay; strong, fine and medium, angular blocky structure; firm, plastic; a few fine and coarse roots; light brownish-gray silt coats around peds; continuous clay films on peds; strongly acid; diffuse, wavy boundary.

IIIC—60 to 66 inches +, mottled red (2.5YR 4/6), strong-brown (7.5YR 5/8), brownish-yellow (10YR 6/8), and light brownish-gray (2.5Y 6/2) clay; massive; firm, plastic; strongly acid.

The Ap horizon ranges from 7.5YR to 10YR in hue, from 4 to 7 in value, and from 3 to 6 in chroma. The Bt horizon is dominantly yellowish red and reddish brown in hue of 5YR, but it ranges to strong brown in hue of 7.5YR. The Bt horizon ranges from silt loam to silty clay loam in texture, and the Bx horizon ranges from clay loam to sandy loam. The matrix of the Bx horizon is yellowish red or reddish brown, has a hue of 5YR, and has distinct yellow, brown, gray, and red mottles. The upper 20 inches of the B horizon is 18 to 35 percent clay, 50 to 60 percent silt, and less than 15 percent sand coarser than very fine sand. In a few places medium-sized quartz pebbles are on the surface.

In the heavy substratum phase, the IIIB horizon, where present, and the IIIC horizon range from silty clay to clay in texture.

Providence silt loam, 2 to 5 percent slopes, severely eroded (PdB3).—This soil is moderately well drained and has a fragipan. It is on ridgetops throughout the county. Rills and shallow gullies are common in most areas.

The present surface layer is dark-brown heavy silt loam about 4 inches thick. It consists mainly of material that was formerly in the subsoil. The subsoil is yellowish-red silty clay loam in the upper part. It has a mottled yellowish-red, yellowish-brown, and light-gray fragipan at a depth of about 20 to 24 inches.

This soil is strongly acid. Natural fertility is moderate. Water moves through the upper part of the subsoil at a moderate rate, but it moves slowly through the fragipan. Available water capacity is moderate. Runoff is medium, and the hazard of further erosion is severe in cultivated areas. Tilth is easily maintained by the proper use of crop residues. The soil can be cultivated throughout a moderate range of moisture content without clodding.

Included with this soil in mapping are small areas of Ora and Paden soils.

Most areas of this Providence soil are cleared and cultivated. Cotton, corn, soybeans, pasture plants, and pine trees are well suited. Capability unit IIIe–1; woodland group 8.

Providence silt loam, 5 to 8 percent slopes (PdC).—This soil has the profile described as typical for the series. It is moderately well drained and has a fragipan. It occurs on ridges and side slopes throughout the county.

The surface layer is pale-brown silt loam about 6 inches thick. The subsoil is yellowish-red silty clay loam in the upper 18 inches. Below is a thick fragipan of mottled red, yellow, and light-gray loam to clay loam.

This soil is strongly acid. Natural fertility is moderate. Water moves through the upper part of the subsoil at a moderate rate, but slowly through the fragipan. Available water capacity is moderate. Runoff is medium, and the hazard of erosion is severe in cultivated areas. Tilth is easily maintained by the proper use of crop residues.

Included with this soil in mapping are small areas of Ora and Paden soils.

Many areas of this Providence soil are wooded, but some small areas are pastured. Cotton, corn, soybeans, pasture plants, and pine trees are well suited. Capability unit IIIe–2; woodland group 7.

Providence silt loam, 5 to 8 percent slopes, severely eroded (PdC3).—This soil is moderately well drained and has a fragipan. It occurs on ridgetops throughout the county. The areas are marked by shallow gullies and rills.

The present surface layer is strong-brown heavy silt loam about 3 inches thick. The subsoil is yellowish-red silty clay in the upper part. It is underlain by a thick fragipan of mottled red, gray, and yellowish-brown silt loam to heavy silt loam at a depth of about 14 to 20 inches. In cultivated areas the plow layer consists mainly of material formerly in the subsoil.

This soil is strongly acid. Natural fertility is moderate. Water moves through the upper part of the subsoil at a moderate rate, but it moves slowly through the fragipan. Available water capacity is moderate. Runoff is medium, and the hazard of erosion is severe in cultivated areas.

Included with this soil in mapping are small areas of Ora and Paden soils.

Most areas of this Providence soil have been cleared and cultivated. Cotton, corn, soybeans, pasture plants, and pine trees are suited. Capability unit IVe–1; woodland group 8.

Providence silt loam, heavy substratum, 2 to 5 percent slopes, severely eroded (PhB3).—This soil is moderately well drained and has a fragipan. It is on ridgetops in the north-central part of the county. Many shallow gullies and rills are present in most areas.

The surface layer is yellowish-brown silt loam about 3 inches thick. The subsoil is reddish-brown to strong-brown silty clay loam to a depth of about 23 inches. Below is a thick, mottled reddish-brown, light-gray, and yellowish-brown fragipan underlain by silty clay.

This soil is strongly acid. Natural fertility is moderate. Water moves through the upper part of the subsoil at a moderate rate, but it moves slowly through the fragipan. Available water capacity is moderate. The hazard of further erosion is severe in cultivated areas. Tilth is easy to maintain by proper use of crop residues. This soil can be cultivated throughout a moderate range of moisture content.

Included with this soil in mapping are small areas of Paden and Tippah soils.

Most areas of this Providence soil have been cleared and cultivated. Cotton, corn, soybeans, pasture plants, and pine trees are well suited. Capability unit IIIe–1; woodland group 8.

Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded (PhC3).—This soil is moderately well drained and has a fragipan. It is on ridges and side slopes in the north-central part of the county. Shallow gullies and rills are present in most fields.

The surface layer is yellowish-brown silt loam about 3 inches thick. The subsoil is reddish-brown silty clay loam to a depth of about 21 inches. Below is a thick, mottled reddish-brown, yellowish-brown, and light-gray fragipan underlain by silty clay.

This soil is strongly acid. Natural fertility is moderate. Water moves through the upper part of the subsoil at a moderate rate, but it moves slowly through the fragipan. The hazard of further erosion is severe in cultivated areas.

Included with this soil in mapping are small areas of Tippah and Paden soils.

Most areas of this Providence soil have been cleared and cultivated at some time, but much of the acreage formerly cultivated is now in pasture or is in trees. Cotton, corn, soybeans, pasture plants, and pine trees are suited to this soil. Capability unit IVe–1; woodland group 8.

Rosebloom Series

The Rosebloom series consists of strongly acid soils on flood plains. These poorly drained soils formed in silty material.

Rosebloom soils are near Arkabutla and Wehadkee soils. They are similar to Arkabutla soils, but at a depth between 20 and 40 inches, 60 percent of the mass has mottles that have chromas of 2 or less. They have less sand throughout their profile than Wehadkee soils.

Typical profile of Rosebloom silt loam in a hayfield, 2 miles northeast of Biggersville, 100 feet south of a local gravel road, and 225 feet east of the bridge (NE¼ SE¼ sec. 11, T. 3 S., R. 7 E.):

Ap—0 to 7 inches, dark-gray (10YR 4/1) silt loam; weak, fine and medium, granular structure; friable; common fine roots; weak plowpan; strongly acid; abrupt, wavy boundary.

B1g—7 to 14 inches, gray (10YR 6/1) silt loam; common, medium, distinct, brown mottles; weak, fine and medium, subangular blocky structure; friable; a few fine roots; many, medium, black splotches and a few fine concretions; strongly acid; gradual, smooth boundary.

B21g—14 to 21 inches, gray (10YR 6/1) heavy silt loam; common, medium, distinct, strong-brown mottles; weak, medium, subangular blocky structure; friable; a few fine roots; common, fine, black concretions and splotches; strongly acid; gradual, smooth boundary.

B22g—21 to 32 inches, gray (10YR 6/1) heavy silt loam; common, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak to moderate, fine and medium, subangular blocky structure; friable; a few fine roots; a few, fine, red and black concretions; very strongly acid; gradual, smooth boundary.

B3g—32 to 45 inches, gray (10YR 6/1) silt loam; many, coarse, distinct, strong-brown (7.5YR 5/6) mottles; weak, coarse, subangular blocky structure; friable; a few fine roots; a few, fine, black concretions; thin coatings of white silt on ped faces; very strongly acid; gradual, smooth boundary.

Cg—45 to 63 inches +, gray (10YR 6/1) light silty clay loam; a few, medium, prominent, yellowish-red mottles; massive; friable; a few, soft, black and red concretions; strongly acid.

The Ap horizon is 10YR in hue and ranges from 4 to 5 in value and from 1 to 3 in chroma. At a depth between 10 and 40 inches, texture is silt loam to silty clay loam. The clay content at this depth ranges from 18 to 35 percent, and less than 15 percent of the sand is coarser than very fine sand. The B2 horizon has a matrix color of gray that is 10YR in hue and ranges from 6 to 7 in value and from 1 to 2 in chroma; where values are 5 or less, chromas are 1 or less. This horizon is mottled brown, yellowish brown, and grayish brown. Soft, black and brown concretions are common throughout the profile. Reaction in these soils ranges from strongly acid to very strongly acid.

Rosebloom silt loam (Rb).—This soil has the profile described as typical for the series. It is a poorly drained soil on flood plains. It occurs mainly in the central part of the county, but small areas are scattered throughout the county.

The surface layer is dark-gray silt loam about 7 inches thick. The subsoil is gray silt loam that extends to a depth of about 45 inches. It is underlain by gray silty clay loam.

This soil is strongly acid. The content of organic matter is small, and natural fertility is moderate. Water moves through the soil at a slow to moderate rate. Available water capacity is high. Runoff is slow to very slow. Flooding frequently occurs during winter and spring, and crops are damaged occasionally.

Included with this soil in mapping are small areas of Arkabutla, Mantachie, and Wehadkee soils.

This Rosebloom soil is well suited to corn, cotton, soybeans, and pasture plants. About half of the acreage is in row crops or pasture. The other half is wooded. Capability unit IIIw–1; woodland group 1.

Rosebloom-Arkabutla association, frequently flooded (Rk).—This mapping unit is on wooded areas of the Tuscumbia River alluvial plain in the north-central part of the county. A few shallow sloughs, formed by water trapped in old streambeds, meander through the areas. Slopes range from 0 to 2 percent. The composition of this unit is more variable than that of most others in the county but has been controlled well enough to interpret for the expected use of the soils concerned.

Rosebloom soils make up about 47 percent of the acreage in this association and Arkabutla about 26 percent. Wehadkee and Mantachie soils make up the rest. The pattern and extent of Rosebloom and Arkabutla soils are uniform throughout each mapped area.

The poorly drained Rosebloom soils are on broad flats. They have a surface layer of light brownish-gray, friable silt loam to silty clay loam that has gray mottles. It is underlain by dominantly gray silty clay loam. Reaction is strongly acid. Natural fertility is moderate. Infiltration is slow, permeability is slow to moderate, and available water capacity is high.

The somewhat poorly drained Arkabutla soils are on high areas near streams and sloughs. They have a surface layer of dark grayish-brown to yellowish-brown, friable silt loam that extends to a depth of about 16 inches. Below is mottled light-gray, yellowish-brown, and strong-brown silty clay loam. Reaction is strongly acid. Natural fertility is moderate. Infiltration is slow, permeability is moderate, and available water capacity is high.

The poorly drained Wehadkee soils are between the sloughs and the broad flats. They have a surface layer of dark grayish-brown silt loam that extends to a depth of 8 inches. It is underlain by mottled gray, yellowish-brown sandy clay loam. Reaction is strongly acid. Natural fertility is moderate to low. Infiltration is slow, permeability is moderately slow, and available water capacity is moderate.

Most areas of this association have a cover of hardwoods and an undergrowth of brush, vines, briers, and canes. The hazard of flooding is severe, and flooding occurs mainly in winter and spring. Low areas remain ponded for long periods. Where suitable drainage is provided, the soils are suited to cotton, corn, and soybeans. Capability unit IVw–2; woodland group 1.

Ruston Series

The Ruston series consists of moderately sloping to very steep, well-drained soils that are strongly acid and very strongly acid. These soils formed on uplands in loamy material.

Ruston soils are near the Cahaba and Ora soils. They have a thicker B horizon than the Cahaba soils and lack the fragipan typical of the Ora soils.

Typical profile of Ruston fine sandy loam, 5 to 8 percent slopes, in a wooded area 5 miles northeast of Rienzi on local gravel road (SW¼SW¼ sec. 22, T. 3 S., R. 8 E.):

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

A2—2 to 7 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; friable; many fine roots; very strongly acid; clear, smooth boundary.

B1—7 to 11 inches, yellowish-red (5YR 5/6) heavy sandy loam; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; weak, fine and medium, subangular blocky structure; friable; some mixing of material from the A2 horizon in this layer; common fine and medium roots; very strongly acid; clear, smooth boundary.

B21t—11 to 20 inches, yellowish-red (5YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; common fine and medium roots; bridging and coating of sand grains; patchy clay films; very strongly acid; clear, smooth boundary.

B22t—20 to 25 inches, yellowish-red (5YR 4/6) heavy sandy loam; weak, fine and medium, subangular blocky structure; friable; a few fine and medium roots; bridging and coating of sand grains; patchy clay films; very strongly acid; gradual, smooth boundary.

B23t&A'2—25 to 38 inches, yellowish-red (5YR 5/8) sandy loam; weak, fine and medium, subangular blocky structure; friable; contains pockets of gray material; a few fine roots; coating and bridging of sand grains; very strongly acid; clear, smooth boundary.

B24t—38 to 58 inches, red (2.5YR 4/8) sandy clay loam; a few, fine, faint, strong-brown mottles; moderate, fine and medium, subangular and angular blocky structure; friable; patchy clay films; coating and bridging of sand grains; very strongly acid; clear, wavy boundary.

B3t—58 to 66 inches, red (2.5YR 4/8) heavy sandy loam and sandy clay loam; weak, fine and medium, subangular blocky structure; friable; a few patchy clay films; coating and bridging of sand grains; very strongly acid.

In the A horizon the color is 10YR in hue and ranges from 3 to 6 in value and from 2 to 4 in chroma. The B horizon is yellowish red and red in hues of 5YR to 2.5YR. Faint yellowish-brown mottles are present in some places. In some places the B horizon extends to a depth of more than 60 inches. Where slopes are smooth, evidence of eluviation is present in the lower part of the B horizon. The Bt horizon ranges from sandy loam to clay loam in texture, but it generally is sandy clay loam. It is 18 to 35 percent clay and 15 to 25 percent silt. More than 15 percent of the Bt horizon is sand coarser than very fine sand. Reaction of these soils ranges from strongly acid to very strongly acid.

Ruston fine sandy loam, 5 to 8 percent slopes (RsC).—This soil has the profile described as typical for the series. It is well drained and is on ridgetops, mainly in the eastern part of the county.

The surface layer is very dark grayish-brown fine sandy loam about 2 inches thick. Just below is about 5 inches of yellowish-brown sandy loam. The subsoil is yellowish-red and red sandy loam to sandy clay loam.

This soil is strongly acid. Natural fertility and content of organic matter are low. Runoff is medium to rapid, and water enters and moves through the soil at a moderate rate. Available water capacity is moderate.

Included with this soil in mapping are small areas of Ora and Shubuta soils.

Most areas of this Ruston soil have been cleared and cultivated or used for pasture. Because the cleared areas were small, many of them have been allowed to return to trees again. Cotton, corn, pasture plants, and pine trees are suited. If moderate amounts of fertilizer are applied, pasture plants grow well and row crops grow fairly well. Capability unit IIIe–3; woodland group 6.

Ruston-Linker association, hilly (RtE).—This mapping unit is on rough, hilly uplands in the western part of the county. Most areas are wooded and consist of long, winding ridges and side slopes that are cut by many natural drainageways. Slopes range from 8 to 40 percent. The composition of this unit is more variable than that of most others in the county but has been controlled well enough to interpret for the expected use of the soils concerned.

Ruston soils make up about 35 percent of the acreage in this association and Linker soils about 25 percent. Cahaba and Ora soils and soils on alluvium make up the rest. The proportion varies from place to place, however, and the percentage of Ruston ranges from 17 to 53 and the percentage of Linker from 5 to 40. Each mapped area consists of Ruston and Linker soils and of one or more of the minor soils.

The well-drained Ruston soils generally are on the middle and upper slopes, though some are on narrow ridgetops. They have a surface layer of dark grayish-brown to dark-brown, friable fine sandy loam about 8 to 15 inches thick. The subsoil is yellowish-red sandy clay loam and is less than 24 inches thick. It is underlain by yellowish-red sandy loam to loamy sand. Reaction is very strongly acid. Natural fertility is low. Infiltration, permeability, and available water capacity are moderate.

The well-drained Linker soils generally are on middle and upper slopes, but in places they are on sharp breaks above heads of drainageways. Their surface layer is dark grayish-brown to dark-brown fine sandy loam about 6 to 12 inches thick. The subsoil is strong-brown to yellowish-red sandy clay loam. It is underlain by sandstone and iron crusts at a depth of about 30 inches. Reaction of the Linker soils is very strongly acid. Natural fertility is moderate. Infiltration and permeability are moderate, and available water capacity is moderate.

The Cahaba soils are also well drained. They are on side slopes. Their surface layer is dark grayish-brown to dark-brown, friable fine sandy loam about 8 to 15 inches thick. The subsoil is yellowish-red sandy clay loam and is less than 24 inches thick. It is underlain by yellowish-red sandy loam to loamy sand. Reaction is very strongly acid. Natural fertility is low. Infiltration, permeability, and available water capacity are moderate.

The moderately well drained Ora soils are on narrow ridgetops. Their surface layer is dark grayish-brown to brown fine sandy loam. The subsoil is strong-brown to yellowish-red sandy clay loam. It has a fragipan about 12 to 36 inches thick at a depth of about 24 inches. This fragipan is underlain by sandy material.

Included with this unit in mapping are a few eroded areas that once were cultivated.

Most areas of this association have a cover of pines and hardwoods. Because of the steep slopes, runoff is very rapid and the hazard of erosion is very severe. The soils therefore are poorly suited to crops or pasture but are suited to trees. Capability unit VIIe–1; woodland group 9.

Ruston-Shubuta-Linker association, hilly (RuE).—This mapping unit is on rough, hilly uplands in the central western and southwestern parts of the county. Most areas are wooded and consist of long, winding ridges and side slopes that are cut by natural drainageways. Slopes range from 8 to 40 percent. The composition of this unit is more variable than that of most others in the county but has been controlled well enough to interpret for the expected use of the soils concerned.

Ruston soils make up about 24 percent of the acreage in this association, Shubuta soils about 19 percent, and Linker soils about 17 percent. Cahaba and Ora soils and soils on alluvium make up the rest. These proportions vary from place to place, however, and the percentage of Ruston ranges from 13 to 35, the percentage of Shubuta from 9 to 29, and the percentage of Linker from 7 to 27. Each mapped area consists of Ruston, Shubuta, and Linker soils and generally one or more of the minor soils.

The well-drained Ruston soils generally are on the middle and upper slopes, though some are on narrow ridgetops. They have a surface layer of dark grayish-brown, friable fine sandy loam about 8 to 15 inches thick. The subsoil is yellowish-red sandy clay loam. Reaction is very strongly acid. Natural fertility is low. Infiltration, permeability, and available water capacity are moderate.

The well-drained Shubuta soils generally are on the upper, middle, and lower slopes. They have a surface layer of dark grayish-brown to dark-brown fine sandy loam about 2 to 8 inches thick. The subsoil is reddish-yellow to yellowish-red sandy clay to clay. It is underlain by mottled gray, red, yellow, and brown sandy clay or sandy clay loam. Reaction is very strongly acid. Natural fertility is low. Infiltration, permeability, and available water capacity are moderate.

The well-drained Linker soils generally are on the middle and upper slopes, but in places they are on sharp breaks above the heads of drainageways. They have a surface layer of dark grayish-brown to dark-brown fine sandy loam about 6 to 12 inches thick. The subsoil is yellowish-red sandy clay loam that is underlain by iron crusts at a depth of about 30 inches. Reaction is very strongly acid. Natural fertility is low. Infiltration and permeability are moderate, and available water capacity is low.

The minor Cahaba and Ora soils are also well drained. Cahaba soils are on narrow ridgetops and upper slopes. They have a surface layer of dark grayish-brown to dark-brown, friable fine sandy loam. The subsoil is yellowish-red sandy clay loam that is less than 24 inches thick. It is underlain by yellowish-red sandy loam to loamy sand. Reaction is very strongly acid. Natural fertility is low. Infiltration, permeability, and available water capacity are moderate.

Ora soils are on narrow ridgetops. They have a surface layer of dark grayish-brown to brown fine sandy loam. The subsoil is strong-brown to yellowish-red sandy clay loam. It has a fragipan about 12 to 36 inches thick at a depth of about 24 inches. The fragipan is underlain by sandy material. Reaction is strongly acid. Natural fertility is moderate to low. Infiltration is slow, permeability is moderate to slow, and available water capacity is moderate.

Most areas of this association have a cover of pine and hardwoods. Because of the steep slopes, runoff is very rapid and the hazard of erosion is very severe. The soils therefore are poorly suited to crops and pasture but are suited to trees. Capability unit VIIe–1; woodland group 9.

Shubuta Series

The Shubuta series consists of gently sloping to very steep, moderately well drained to well drained soils. These strongly acid soils formed on uplands in fine-textured material.

Shubuta soils are near Providence and Tippah soils. They have more silt in the upper part of the subsoil than Providence soils and lack the fragipan typical of those soils. Shubuta soils contain more clay than Tippah soils.

Typical profile of Shubuta clay loam, 8 to 12 percent slopes, severely eroded, in an idle field, 2 miles northwest of Wenasoga, north of blacktop road, and on west side of local gravel road (NW¼SE¼ sec. 18, T. 1 S., R. 7 E.):

Ap—0 to 2 inches, strong-brown (7.5YR 5/6) clay loam; weak, fine and medium, granular and subangular blocky structure; friable; many fine roots; common, coarse, iron rocks and crusts; very strongly acid; abrupt, wavy boundary.

B21t—2 to 14 inches, yellowish-red (5YR 4/6) clay; strong, medium and fine, angular and subangular blocky structure; friable to firm, plastic; common fine roots; clay films on ped faces; very strongly acid; clear, smooth boundary.

B22t—14 to 23 inches, mottled red (2.5YR 4/8) and yellowish-brown (10YR 5/4) clay; strong, medium and fine, angular blocky structure; friable to firm, plastic; a few fine roots; clay films on ped faces; very strongly acid; gradual, smooth boundary.

B23t—23 to 38 inches, mottled red (2.5YR 4/8), strong-brown (7.5YR 5/8), and light brownish-gray (2.5YR 6/2) clay; moderate, coarse, angular blocky and subangular blocky structure that tends toward strong platy; firm, plastic; parts of this layer appear to be stratified; very strongly acid; gradual, smooth boundary.

B24t—38 to 58 inches, light brownish-gray (2.5YR 6/2) clay loam; common, medium, distinct, yellowish-brown mottles; massive, but breaks to moderate, medium and coarse, subangular and angular blocky structure;

firm, plastic; clay films on ped faces; large pressure faces; very strongly acid; gradual, smooth boundary.

B3t—58 to 65 inches +, light brownish-gray (2.5YR 6/2) clay loam; common, medium, distinct, yellowish-brown and yellowish-red mottles; weak, coarse, angular blocky structure; firm, plastic; a few clay films; a few mica flakes; very strongly acid.

In the Ap horizon, and in the A2 horizon, where present, the color ranges from 7.5YR to 10YR in hue, from 4 to 6 in value, and from 3 to 6 in chroma. In uncultivated areas the A1 horizon is 1 to 4 inches thick, has a hue of 10YR, values of 2 to 4, and chromas of 1 and 2. The Bt horizon is dominantly yellowish red. It generally is 5YR in hue, but hues range from 2.5YR to 7.5YR, values from 4 to 6, and chromas from 6 to 8. The upper 20 inches of the Bt horizon is 35 to 50 percent clay, 25 to 30 percent silt, and 25 to 30 percent sand. Gray, brown, and yellow mottles, not caused by wetness, are present below a depth of 20 inches. A few to many iron crusts are on the surface of these soils. They range from 15 to 25 millimeters in diameter. Reaction of these soils is strongly acid to very strongly acid.

Shubuta loam, 2 to 5 percent slopes, eroded (SbB2).—This well-drained soil is on ridgetops throughout the county. The surface layer is yellowish-brown loam about 6 inches thick. The subsoil is yellowish-brown heavy clay loam in the upper part and yellowish-red heavy clay loam in the lower part. The lower part has mottles of yellowish brown and light brownish gray below a depth of 15 inches. In places plowing has mixed material from the subsoil with the remaining surface layer, and rills and shallow gullies are present.

This soil is strongly acid. Natural fertility and content of organic matter are low. Water moves through the soil at a moderate rate, and available water capacity is moderate. The hazard of further erosion is severe in cultivated areas.

Included with this soil in mapping are small areas of Ora, Providence, and Tippah soils.

Most areas of this Shubuta soil are cleared and cultivated. Pasture plants grow well and row crops grow fairly well if moderate amounts of fertilizer are used. Capability unit IIe-3; woodland group 6.

Shubuta clay loam, 8 to 12 percent slopes, severely eroded (ScD3).—This well-drained soil has the profile described as typical for the series. It is in the uplands on side slopes and breaks near ridgetops. The areas are marked by many gullies and rills.

The surface layer is strong-brown clay about 2 inches thick. The subsoil is yellowish-red to red heavy clay loam or clay. It has yellowish-brown and light brownish-gray mottles below a depth of 14 inches.

This soil is strongly acid. Natural fertility and content of organic matter are low. Infiltration is slow, and permeability and available water capacity are moderate. Because of strong slopes and rapid runoff, the hazard of further erosion is severe if this soil is left unprotected.

Included with this soil in mapping are small areas of Ora, Providence, and Tippah soils.

Most areas of this Shubuta soil are either pastured or wooded. Capability unit VIe-1; woodland group 8.

Sumter Series

The Sumter series consists of moderately steep, mildly alkaline to alkaline soils. These well-drained soils formed in fine-textured material.

Sumter soils are near Oktibbeha soils. They are not so red as Oktibbeha soils but are more alkaline.

Typical profile of Sumter silty clay, about 2 miles west of Corinth and north of the junction of U.S. Highway 72 and State Highway 2 (SE¼SW¼ sec. 4, T. 2 S., R. 7 E.):

Ap—0 to 6 inches, grayish-brown (2.5Y 5/2) silty clay; moderate, fine, angular blocky structure; plastic; many fine roots; moderately alkaline; calcareous; clear, wavy boundary.

B2—6 to 14 inches, light yellowish-brown (2.5Y 6/4) clay; moderate, fine and medium, subangular blocky structure; plastic; a few fine roots; moderately alkaline; calcareous; gradual, wavy boundary.

B3—14 to 26 inches, mottled dark grayish-brown (2.5Y 4/2) and pale-yellow (2.5Y 7/4) clay; moderate, fine and medium, subangular and angular blocky structure; plastic; a few spots of soft, white calcium carbonate; moderately alkaline; calcareous; gradual, wavy boundary.

C—26 to 50 inches, mottled pale-yellow (5Y 7/4), light-gray (2.5Y 7/2), and dark grayish-brown (2.5Y 4/2) silty clay loam or soft marl; massive; rocks in places; calcareous.

The Ap horizon is 2.5Y in hue and ranges from 4 to 6 in value and from 2 to 5 in chroma. The B horizon ranges from olive brown to light yellowish brown and dark grayish brown in hue of 2.5Y. The upper 20 inches of the B horizon is 35 to 45 percent clay and 30 to 45 percent silt. The solum contains many lime nodules and pockets and is more than 40 percent calcium carbonate. The C horizon is dominantly a soft marl and occurs at a depth of about 30 inches.

Sumter-Gullied land complex, 8 to 25 percent slopes (SgE).—This mapping unit is in concave areas along the side slopes of ridges and low hills in the north-central part of the county. The areas range from 10 to 30 acres in size. Sumter soils make up about 55 percent of the acreage and Gullied land about 45 percent.

Sumter soils have a surface layer of grayish-brown to yellowish-brown silty clay about 6 inches thick. The subsoil is olive-brown to light yellowish-brown silty clay loam to clay that extends to a depth of about 30 inches. It is underlain by mottled pale-yellow to light-gray silty clay loam or marly clay. Sumter soils occupy areas between areas of Gullied land. In most areas of Gullied land, the gullies may have cut into marly clay or soft chalk. The gullies are 4 to 10 feet wide and 2 to 4 feet deep and are about 50 feet apart.

The Sumter soils in this complex are mildly alkaline to moderately alkaline. Their natural fertility is low. Infiltration and permeability are slow, and available water capacity is moderate. Runoff is rapid on both Sumter soils and Gullied land.

Most areas of this mapping unit are idle, but a few areas once were cultivated. Areas of Sumter soils produce moderate amounts of medium and tall grasses, and Gullied land has a sparse cover of grasses and shrubs. A few scattered redcedars grow on the Sumter soils. Other redcedars have been planted in a few places, but they are difficult to establish because tilth is poor, runoff is rapid, and the supply of moisture is low. Capability unit VIIe-3; woodland group 4.

Sumter-Oktibbeha complex, 12 to 17 percent slopes, eroded (SoE2).—This mapping unit is on the south side of hills that border large streams in the north-central part of the county. These areas generally are wooded or idle and have sharp breaks between the upland and the bottom land. Most of the mapping units are small, and none are larger than adjacent mapping units that contain only one soil. The acreage is about equally divided between Sumter and Oktibbeha soils.

The well-drained Sumter soils are near the ridgetops and upper slopes. They have a surface layer of yellowish-brown to grayish-brown silty clay to silty clay loam about 6 inches thick. Their subsoil is pale-yellow to light yellowish-brown. It is underlain by chalk. The Sumter soils are mildly alkaline. Natural fertility is low. Infiltration and permeability are slow, and available water capacity is moderate.

The moderately well drained to well drained Oktibbeha soils are on middle and upper slopes. They have a surface layer of very dark grayish-brown to dark yellowish-brown silty clay about 2 inches thick. The subsoil is yellowish-red to dark-red clay that is underlain by mottled gray, yellowish-red, and pale-yellow clay. Oktibbeha soils are medium acid to a depth of about 30 inches. Below this, in the layer of marly clay, they are neutral to mildly alkaline. Infiltration is slow, permeability is very slow, and available water capacity is moderate. These soils crack when they are dry, and they have a high shrink-swell potential.

This mapping unit is not suited to crops and pasture. Most areas are wooded or are left idle. Capability unit VIe-3; woodland group 4.

Tippah Series

The Tippah series consists of gently sloping, strongly acid soils. These moderately well drained soils formed in loamy material underlain by clayey material.

Tippah soils are near Providence and Shubuta soils. They have more clay in the lower part of the subsoil than Providence soils and lack the fragipan characteristic of those soils. They are not so red as Shubuta soils, but they have more silt and less clay in the upper part of the subsoil.

In this county Tippah soils are mapped only in a complex with Providence soils. A description of Providence soils is given under the Providence series.

Typical profile of Tippah silt loam, 3 miles northwest of Corinth on Wenasoga Road, south of the Southern Railroad, and 65 feet southwest of a telephone pole (NE¼SE¼ sec. 28, T. 1 S., R. 7 E.):

Ap—0 to 3 inches, dark-brown (7.5YR 4/4) with some yellowish-red (5YR 5/6) heavy silt loam; weak, fine to coarse, subangular blocky structure; slightly hard, friable, slightly plastic; common fine roots; very strongly acid; clear, smooth boundary.

B1—3 to 8 inches, dark-brown (7.5YR 4/4) light silty clay loam; moderate, fine and medium, subangular blocky structure; friable; common fine roots; patchy clay films on peds; very strongly acid; abrupt, smooth boundary.

B21t—8 to 15 inches, mottled red (2.5YR 4/6), yellowish-red (5YR 4/6), and yellowish-brown (10YR 5/6) silty clay loam; moderate, fine and medium, subangular blocky and angular blocky structure; common fine roots; firm, plastic; continuous clay films around peds; very strongly acid; clear, smooth boundary.

IIB22t—15 to 25 inches, mottled yellowish-red (5YR 5/6) and yellowish-brown (10YR 5/6) silty clay; a few, fine, distinct, red mottles; strong, fine and medium, angular blocky structure; firm, plastic; a few fine roots; clay films on peds; very strongly acid; clear, smooth boundary.

IIB23t—25 to 30 inches, mottled strong-brown (7.5YR 5/6), red (2.5YR 4/6), light-gray (10YR 7/2), and yellowish-brown (10YR 5/6) silty clay; strong, fine and medium, angular blocky structure; a few fine roots; firm, plastic; clay films on peds; very strongly acid; clear, smooth boundary.

IIB24t—30 to 48 inches, mottled light-gray (10YR 7/1), brownish-yellow (10YR 6/6), yellowish-brown (10YR 5/8), and red (2.5YR 4/6) silty clay; moderate to strong, fine to medium, angular blocky structure; firm, plastic; clay films on peds; diffuse boundary.

IIB3t—48 to 60 inches, mottled light-gray (10YR 7/1), yellowish-brown (10YR 5/8), and brownish-yellow (10YR 6/6) silty clay; massive; firm, plastic, sticky; very strongly acid.

In the Ap horizon the color is 7.5YR to 10YR in hue and ranges from 4 to 5 in value and from 4 to 6 in chroma. The Bt horizon is strong brown to red and yellowish red in hues of 2.5YR to 10YR and is mottled in places. The IIB horizon is red to gray and ranges from silty clay to clay. In this horizon the number of gray mottles increases with depth. In the B horizon the clay content ranges from 18 to 30 in the silty upper part to 45 to 55 percent in the clayey lower part. Less than 15 percent of the sand in the B horizon is very fine sand. Reaction in these soils ranges from strongly acid to very strongly acid.

Tippah-Providence complex, 2 to 8 percent slopes, severely eroded (TpC3).—This mapping unit is on ridges and side slopes in the north-central part of the county. Tippah soils make up about half the acreage and Providence soils the other half.

The Tippah soils have a surface layer of dark-brown silt loam about 2 inches thick. The subsoil is reddish-brown or mottled silty clay loam to a depth of about 17 inches and thick mottled silty clay to clay below.

The Providence soils have a surface layer of brown silt loam about 2 inches thick. The subsoil is reddish-brown to strong-brown silty clay loam about 12 inches thick. At a depth of about 14 inches is a thick, mottled fragipan that is reddish brown, light gray, and yellowish brown. The substratum is clayey and begins at a depth of about 40 inches.

These soils are strongly acid. Natural fertility is moderate. Many rills and a few shallow gullies mark the surface. Most of the surface layer has been washed away, and the present plow layer consists mostly of material that was formerly in the subsoil. Tippah soils are droughty in dry summer months because of their clayey layer. In Providence soils water moves through the upper part of the subsoil at a moderate rate, but it moves slowly through the fragipan.

Most areas of this mapping unit are cultivated or pastured. If moderate amounts of fertilizer are applied, pasture plants grow well and cotton and corn grow fairly well. The hazard of further erosion is severe if these soils are cultivated. Pasture plants and pine trees are suited. Capability unit IVe-1; woodland group 8.

Trinity Series

The Trinity series consists of mostly level, neutral to mildly alkaline soils. These moderately well drained soils formed in fine-textured material washed from such upland soils as Oktibbeha and Sumter.

Trinity soils are near Arkabutla, Leeper, and Mantachie soils. They have a darker colored surface layer than Arkabutla soils but are more alkaline and have less distinct mottles at a depth between 20 and 30 inches. They lack the mottles that are directly below the plow layer or directly below a depth of 10 inches in the Leeper soils. They are not so sandy at a depth between 10 and 40 inches as Mantachie soils.

Typical profile of Trinity silty clay along a pipeline in a 15-acre hayfield about 5 miles south of Corinth and 200 feet on the east side of U.S. Highway 45 (NW¼SW¼ sec. 3, T. 3 S., R. 7 E.):

Ap1—0 to 4 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, fine and medium, granular structure; slightly hard, friable; many fine roots; mildly alkaline; calcareous; abrupt, smooth boundary.

Ap2—4 to 11 inches, very dark grayish-brown (2.5YR 3/2) silty clay; strong, coarse, angular blocky structure; very hard, firm; a few fine and medium roots; plowpan layer; common, fine root holes; a few, medium, shell particles; mildly alkaline; calcareous; abrupt, smooth boundary.

A11—11 to 24 inches, very dark-gray (10YR 3/1) silty clay; strong, medium and coarse, prismatic and subangular and angular blocky structure; hard, firm, plastic; a few fine roots; a few fine pressure faces; mildly alkaline; calcareous; gradual, smooth boundary.

A12—24 to 39 inches, very dark-gray (10YR 3/1) silty clay; a few, medium, faint, light olive-brown mottles; moderate to strong, fine and medium, angular and subangular blocky structure; firm, plastic; a few fine roots; a few fine pressure faces; a few, fine, red concretions; a few slickensides that do not intersect; moderately alkaline; calcareous; gradual, smooth boundary.

Clg—39 to 56 inches, mottled dark grayish-brown (2.5YR 4/2) and light olive-brown (2.5YR 5/4) silty clay; moderate, coarse, angular blocky and subangular blocky structure; firm, plastic; a few fine roots; common, large, pressure faces; slickensides; mildly alkaline; calcareous; diffuse, smooth boundary.

C2g—56 to 70 inches, mottled dark grayish-brown (2.5YR 4/2) and light olive-brown (2.5YR 5/4) silty clay; massive, but breaks to moderate, fine, angular blocky structure; friable, plastic; a few pressure faces; a few, fine, black concretions; mildly alkaline; calcareous.

In the Ap horizon color is 2.5YR to 10YR in hue and ranges from 2 to 3 in value and from 1 to 2 in chroma. The C horizon is mottled with shades of olive brown, dark gray, and grayish brown. At a depth between 10 and 40 inches, the clay content is 40 to 50 percent and the silt content is 50 to 55 percent. A few shell particles are present in some places below a depth of about 6 inches. These particles range from 5 to 15 millimeters in diameter. Red and black concretions occur in places. These soils are mainly calcareous throughout the profile. Reaction ranges from neutral to mildly alkaline.

Trinity silty clay (Tr).—This is the only Trinity soil mapped in the county. It is moderately well drained and occurs in the north-central part of the county on narrow bottom lands at the heads of small drainageways.

The surface layer is very dark grayish-brown to very gray silty clay. Below is dark grayish-brown silty clay or clay about 30 inches thick. The underlying material is alluvium washed from areas of Blackland Prairie.

This soil is neutral to alkaline. Natural fertility is high. Water moves through the soil at a slow rate, and available water capacity is high. Crops on this soil are subject to slight to moderate damage by flooding.

Included with this soil in mapping are small areas of Leeper clay loam and small areas of soils that have a dark-colored surface layer less than 24 inches thick.

Most areas of this soil are in row crops. Capability unit IIw-2; woodland group 2.

Wehadkee Series

The Wehadkee series consists of nearly level, strongly acid to very strongly acid soils on flood plains. These poorly drained soils formed in loamy material washed from uplands.

Wehadkee soils are near Mantachie, Rosebloom, and Leeper soils. They have less distinct mottles at a depth between 10 and 30 inches than Mantachie soils. They have more sand throughout their profile than Rosebloom soils. Unlike Leeper soils, Wehadkee soils are acid and contain more clay at a depth between 10 and 40 inches.

Typical profile of Wehadkee fine sandy loam in large pasture south of State Highway 2, about 4 miles west of Kossuth, 400 feet west of the Hatchie Canal, and 40 feet south of gravel road (SW¼SW¼ sec. 13, T. 3 S., R. 5 E.):

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

A1—3 to 6 inches, mottled brown (10YR 4/3) and gray (10YR 6/1) fine sandy loam; weak, medium, granular structure; friable; common fine roots; very strongly acid; common, wavy boundary.

B1g—6 to 12 inches, gray (10YR 6/1) sandy loam; common, medium, distinct, brown and brownish-yellowish mottles; weak, fine and medium, granular and subangular blocky structure; friable; common fine roots; very strongly acid; clear, wavy boundary.

B2g—12 to 42 inches, gray (10YR 6/1) and yellowish-brown (10YR 5/4) loam; a few, fine, black mottles; weak, fine and medium, subangular blocky structure; friable; a few fine roots; very strongly acid; gradual, smooth boundary.

Cg—42 to 55 inches +, gray (10YR 6/1) silty clay loam; many, medium, distinct, yellowish-brown mottles; structureless (massive); friable, plastic; a few, soft, red concretions; very strongly acid.

The A horizon ranges from 2 to 7 inches in thickness. The Ap horizon is 10YR in hue and ranges from 3 to 5 in value and from 1 to 3 in chroma. The B horizon ranges from sandy loam to sandy clay loam. It is gray and has brown and yellow mottles. At a depth between 10 and 40 inches, the soil is 18 to 35 percent clay and more than 15 percent sand coarser than very fine sand. The concretions in the C horizon range from few to many in quantity and generally are brown or black in color. Reaction in these soils ranges from strongly acid to very strongly acid.

Wehadkee-Mantachie association, frequently flooded (Wm).—This mapping unit is on wooded areas of the Tuscumbia River alluvial plain. A few shallow streams and sloughs that developed from water trapped in old stream beds meander through the areas. Slopes range from 0 to 2 percent. The composition of this unit is more variable than most others in the county but has been controlled well enough to interpret for the expected use of the soils concerned.

Wehadkee soils make up about 47 percent of this association and Mantachie soils about 35 percent. Arkabutla and Rosebloom soils make up the remaining 18 percent. The pattern and extent of the soils are fairly uniform throughout the mapped areas.

The poorly drained Wehadkee soils occupy low areas. They have a surface layer of dark grayish-brown fine sandy loam about 4 inches thick. The subsoil is gray loam that is mottled with brown and yellow. Reaction is strongly acid. Natural fertility is low to moderate. Infiltration is slow, permeability is moderate to slow, and available water capacity is moderate.

The somewhat poorly drained Mantachie soils are on broad flats. They have a surface layer of dark-brown to grayish-brown, friable fine sandy loam about 14 inches thick. The subsoil is yellowish-brown, friable loam that has gray mottles. It is underlain by dominantly light-gray, friable loam. Reaction is strongly acid. Natural fertility is moderate. Infiltration is slow, and permeability and available water capacity are moderate.

The somewhat poorly drained Arkabutla soils occur throughout the mapped areas. They have a surface layer of dark grayish-brown to yellowish-brown, friable silt loam about 16 inches thick. Below is mottled light-gray, yellowish-brown, and strong-brown silty clay loam. Reaction is strongly acid. Natural fertility is moderate. Infiltration is slow, permeability is moderate, and available water capacity is high.

The poorly drained Rosebloom soils are on broad flats. They have a surface layer of dark-gray, friable silt loam to silty clay loam that has gray mottles. Below is silty clay loam that is dominantly gray. Reaction is strongly acid. Natural fertility is moderate. Infiltration is slow, permeability is slow to moderate, and available water capacity is high.

Hardwoods and a dense undergrowth of brush, vines, briers, and canes cover the areas of this mapping unit. Flooding is a severe hazard, especially in winter and spring, and low areas remain ponded for long periods. Capability unit IVw-2; woodland group 3.

Wehadkee-Mantachie complex (Wn).—This mapping unit occurs along streams throughout the county. Wehadkee soils make up about 60 percent of each mapped area, and Mantachie soils, about 35 percent. The remaining 5 percent consists of soils that have a sandy loam subsoil.

The poorly drained Wehadkee soils have a brown loam surface layer, about 3 inches thick, underlain by gray sandy clay loam. These soils are strongly acid. Natural fertility is moderate to low. Available water capacity is moderate.

The somewhat poorly drained Mantachie soils have a surface layer of dark-brown to grayish-brown, friable fine sandy loam about 14 inches thick. The subsoil is yellowish-brown, friable loam that has gray mottles. It is underlain by friable loam that is dominantly light gray. These soils are strongly acid. Natural fertility is moderate. Infiltration is slow, and permeability and available water capacity are moderate.

About half of this complex is pastured, and the other half is wooded. Pasture plants and trees are suited. Flooding generally occurs in winter or early in spring. Capability unit IIIw-1; woodland group 3.

Use and Management of the Soils

This section briefly describes the system of capability classification used by the Soil Conservation Service; discusses the use and management of the soils for crops and pasture; and gives a table showing the estimated acre yields of the principal crops for the arable soils of the county. In addition it discusses woodland and wildlife, and use of the soils for recreation and for engineering purposes.

General Management for Crops and Pasture

The chief problems in managing the soils of Alcorn County are maintaining the content of organic matter, increasing fertility, and controlling erosion. Cultivation lowers the content of organic matter, causes losses of plant nutrients by leaching, and increases the hazard of erosion. Cropping systems are needed therefore that help to maintain the content of organic matter, decrease the hazard of erosion, and increase fertility. On sloping soils contour stripcropping or terraces are needed for control of erosion and to conserve moisture.

Close-growing crops or sod crops and annual cover crops grown in sequence with row crops also help to maintain the content of organic matter, control erosion, and improve fertility. The ratio between the length of time that such cover is needed and the length of time that a row crop should be grown depends on the type of soil, the slope, and the hazard of erosion. In addition crop residues should be shredded and left on the surface after crops are harvested. In areas where flooding occurs, these residues should be disked into the surface layer.

Commercial fertilizer is needed for all cultivated crops, as well as all pastures, in the county. The need varies, depending on the crop and the type of soil. The amount to apply and the frequency of application are determined by the results of soil tests. Advice on the amount and kind of fertilizer to apply can be obtained from the local offices of the Extension Service and from the Mississippi Agricultural Experiment Station.

Adequate drainage is needed on some soils in the county to grow crops successfully. Drainage mains and laterals that have field ditches draining into them can be used to provide surface and internal drainage. Diversions can be used to prevent water from hillsides from flowing over soils on bottom lands.

In pastures, well-managed stands of good grasses and legumes protect the soil from erosion, provide forage and feed for livestock, and increase the content of organic matter. The soils of Alcorn County are suited to a wide variety of pasture grasses and legumes, but some soils are better suited than others. The individual needs of the farmer and the kind of livestock enterprise influence the selection of pasture plants. Local offices of the Soil Conservation Service can help the farmer in determining which plants and plant combinations are best suited to a particular soil.

Common bermudagrass, Coastal bermudagrass, bahiagrass, dallisgrass, and tall fescue are perennial grasses that are widely adapted to soils in this county. White clover, wild winter peas, common lespedeza, and sericea lespedeza are legumes that are well adapted.

Grasses and legumes grow better and produce more forage in pastures that are not overgrazed. Overgrazing can be avoided if pastures are properly stocked, and if grazing is rotated. Also, control of brush and weeds is essential.

Capability grouping

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

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

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

Class I soils have few limitations that restrict their use. (None in Alcorn County.)

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

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

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife. (None in Alcorn County.)

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (None in Alcorn County.)

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

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

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-3 or IIIe-1. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitations; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

In the following pages the capability units in Alcorn County are described and suggestions for the use and management of the soils are given. Crops on most soils in this county respond if fertilizer and lime are applied. The kinds and amounts to use can be determined by soil tests. Soil series names are mentioned in each capability unit, but this does not mean that all mapping units of these series are in that particular unit. The "Guide to Mapping Units" at the back of the survey lists the soils in each unit.

CAPABILITY UNIT IIe-1

Ora fine sandy loam, 2 to 5 percent slopes, eroded, is the only soil in this unit. It consists of moderately well drained, strongly acid soil that has a fragipan. This soil is in upland areas. The subsoil is sandy loam to clay loam.

The content of organic matter is low in this soil, and natural fertility is moderate. Infiltration is slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan. Available water capacity is moderate.

Cotton, corn, soybeans, sorghum, and similar row crops are well suited to this soil. Coastal bermudagrass, bahiagrass, tall fescue, wild winter peas, vetch, common lespedeza, sericea lespedeza, crimson clover, and white clover are suitable pasture plants. Pine trees are suitable for woodland.

If this soil is cultivated and not protected, further erosion is likely. Row crops can be grown continuously, however, under management that includes using a suitable cropping system, cultivating on the contour, stripcropping, terracing, and the use of grass waterways. These practices reduce the speed of runoff and thus help to control erosion. Shredding crop residues and leaving them on the surface as a mulch increases infiltration and also helps to control erosion. In addition lime and fertilizer are needed.

CAPABILITY UNIT IIe-2

Paden silt loam, 2 to 5 percent slopes, is the only soil in this unit. It consists of moderately well drained, very strongly acid soil that has a fragipan at a depth of about 24 inches. The surface layer is a very friable silt loam. The subsoil is loam to silty clay loam.

The content of organic matter is low, and natural fertility is moderate in this soil. Available water capacity is moderate, and infiltration is slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan. The fragipan retards the growth of roots. The hazard of erosion is moderate.

If this soil is well managed, it is suited to all crops and pasture plants that are grown in the area. Cotton, corn, soybeans, sorghum, and small grains are suitable row crops. Legumes that are well suited are wild winter peas, common lespedeza, sericea lespedeza, white clover, crimson clover, and vetch. Sudangrass, common bermudagrass, Coastal bermudagrass, bahiagrass, and tall fescue are suitable grasses. Pine trees are well suited for woodland.

Row crops can be grown continuously by using a suitable cropping system, cultivating on the contour, stripcropping, terracing, and use of grassed waterways. These practices reduce the amount and speed of runoff and thus help to control erosion. Returning all crop residues to the soil and arranging rows so they reduce the speed of runoff also help to control erosion.

CAPABILITY UNIT IIe-3

Shubuta loam, 2 to 5 percent slopes, eroded, is the only soil in this unit. It is a well-drained, strongly acid soil. The subsoil is heavy clay loam.

The content of organic matter and natural fertility are low in this soil. Infiltration is slow. Permeability is moderate in the surface layer and subsoil. Available water capacity is moderate.

Cotton, corn, soybeans, sorghum, and small grains are suitable row crops. Suitable pasture plants are bermudagrass, bahiagrass, vetch, wild winter peas, common lespedeza, sericea lespedeza, and white clover. Pine trees are suited to this soil.

If this soil is cultivated, it should be kept in close-growing crops about half of the time. Row crops can be grown continuously, however, under management that includes cultivating on the contour, stripcropping, terracing, and the use of grassed waterways. These practices reduce the speed of runoff and thus help to control erosion. Effective use of crop residues and arrangement of rows also help to control erosion.

CAPABILITY UNIT IIw-1

This unit consists of somewhat poorly drained, strongly acid, alluvial soils in the Arkabutla and Mantachie series. Slopes are less than 2 percent except for a few areas of local alluvium where slopes are 3 or 4 percent. The surface layer of soils in this unit is very friable silt loam or fine sandy loam, and the subsoil is heavy silt loam or loam.

The content of organic matter is low in these soils, and natural fertility is moderate. Available water capacity is moderate to high, and infiltration is slow. Permeability is moderate.

If these soils are well managed, they are well suited to bahiagrass, bermudagrass, common lespedeza, corn, cotton (fig. 4), dallisgrass, Ladino clover, red clover, white clover, sorghum, tall fescue, and wild winter peas. They are also suited to pine trees and some hardwoods.

The hazard of flooding and consequent damage to crops on these soils generally is moderate, but it ranges from slight to moderate. Removal of surface water is a problem in some places. Where row crops are planted, the rows should be designed so that each will carry excess water to a properly constructed outlet. Field ditches and drainage laterals generally are needed. Diversion terraces help to keep runoff from the hillsides from flowing across these bottom-land soils. Row crops can be grown continuously if fertilizer is applied and if crop residues are used effectively.

Figure 4.—Cotton on Arkabutla silt loam, capability unit IIw-1.

CAPABILITY UNIT IIw-2

Trinity silty clay is the only soil in this unit. It is a moderately well drained, neutral to alkaline soil that is underlain by silty clay or clay. Slopes are 0 to 2 percent.

Natural fertility is high in this soil. Infiltration and permeability are slow, and available water capacity is high. This soil cracks when dry and packs if left unprotected.

This soil is suited to small grains and to row crops. If it is well managed, it is well suited to such legumes as sericea lespedeza, common lespedeza, wild winter peas, white clover, and sweetclover and to such grasses as Coastal bermudagrass, common bermudagrass, dallisgrass, bahiagrass, johnsongrass, and tall fescue.

Row crops can be grown continuously on this soil if the surface is protected after harvesting is complete. Seedbeds should be prepared in the fall to give the soil time to settle before planting. In some years planting is delayed in spring because of wetness. Diversion terraces are needed in places to divert water from nearby hillsides away from this soil. Field ditches can be used to remove excess surface water.

CAPABILITY UNIT IIw-3

Paden silt loam, 0 to 2 percent slopes, is the only soil in this unit. It is a moderately well drained, strongly acid soil that has a fragipan. This soil is in the uplands. The subsoil is heavy silt loam and silty clay loam.

The content of organic matter is low in this soil, and natural fertility is moderate. Infiltration is slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan. Available water capacity is moderate.

This soil is suited to small grains, row crops, and pine trees. Under good management it is well suited to oats, cotton, corn, soybeans, and sorghum. Suitable grasses are bermudagrass, dallisgrass, bahiagrass, and tall fescue, and suitable legumes are common lespedeza, sericea lespedeza, wild winter peas, vetch, and white clover.

Because this soil is nearly level, excess surface water is a slight hazard in wet periods. Field ditches can be used to remove excess water.

CAPABILITY UNIT IIIe-1

This unit consists of moderately well drained, strongly acid soils of the Providence series. These soils are on uplands and are severely eroded. They have a fragipan at a depth of about 20 to 26 inches. The surface layer is silt loam, and the subsoil is silty clay loam.

The content of organic matter is low in these soils, and natural fertility is moderate. Available water capacity is moderate, and infiltration is slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan. The fragipan retards the growth of roots.

Under good management these soils are well suited to row crops, pasture plants, and pine trees. Suitable crops are cotton, corn, soybeans, sorghum, small grains, common bermudagrass, Coastal bermudagrass, bahiagrass, fescue, wild winter peas, common lespedeza, sericea lespedeza, white clover, crimson clover, sudangrass, and vetch.

Row crops can be grown half of the time under management that includes contour tillage, terracing, stripcropping, and use of grassed waterways for control of erosion. If no practices are used to reduce runoff and prevent further erosion, the cropping system should consist predominantly of close-growing crops.

CAPABILITY UNIT IIIe-2

Providence silt loam, 5 to 8 percent slopes, is the only soil in this unit. It is a moderately well drained, strongly acid soil that has a fragipan. This soil is in the uplands. The surface layer is a friable silt loam. The subsoil is silty clay loam.

The content of organic matter is low in this soil, and natural fertility is moderate. Water is absorbed slowly. Permeability is moderate in the surface layer and upper part of the subsoil but slow in the fragipan. Available water capacity is moderate. The erosion hazard is severe.

If this soil is well managed, it is suited to corn, small grains, Coastal bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, vetch, common lespedeza, and white clover. It is well suited to pines, and hardwoods grow well in some places.

Row crops can be grown about half of the time under management that includes contour tillage, terracing, stripcropping, and use of grassed waterways. These practices reduce the speed and amount of runoff and thus help to prevent erosion. Where terraces are not used, the cropping system should consist chiefly of close-growing crops or sod crops.

CAPABILITY UNIT IIIe-3

Ruston fine sandy loam, 5 to 8 percent slopes, is the only soil in this unit. This well-drained, strongly acid to very strongly acid soil is in the uplands. It has a subsoil of heavy sandy loam or sandy clay loam.

The content of organic matter and natural fertility are low in this soil. Infiltration, permeability, and available water capacity are moderate. Plant roots penetrate this soil easily, and the root zone is deep. The hazard of erosion is severe.

If this soil is well managed, it is suited to cotton, corn, soybeans, sorghum, and small grains. The soil is also suited to such grasses as Coastal bermudagrass, common bermudagrass, bahiagrass, dallisgrass, johnsongrass, tall fecue, and sudangrass. Legumes that are suited are wild winter peas, vetch, common lespedeza, sericea lespedeza, crimson clover, white clover, and red clover. Pine trees are suited for woodland.

Row crops can be grown about half the time if a suitable cropping system is used and management is provided that includes stripcropping, terracing, and use of grassed waterways. Where no practices are provided to reduce runoff and control erosion, the areas should be kept predominantly in close-growing crops.

CAPABILITY UNIT IIIw-1

This unit consists of poorly drained, acid soils in the Mantachie, Rosebloom, and Wehadkee series. These soils are on bottom lands. The surface layer is silt loam to fine sandy loam, and the subsoil is sandy loam to silty clay loam. Slopes are 0 to 2 percent.

The content of organic matter is low in these soils, and natural fertility is low to moderate. Infiltration is slow, and permeability is moderate to slow. Water stands on these soils in winter and early in spring.

If these soils are well managed, they are well suited to cotton, corn, soybeans, and sorghum. Suitable legumes and grasses are wild winter peas, vetch, lespedeza, white clover, and tall fescue.

Excess surface water and flooding are the main concerns of management. Row crops can be grown continuously, however, under management that includes use of field ditches constructed at right angles to the crop rows. Diversion terraces can be used where runoff from hillsides is a problem. In addition, crop residues should be shredded and left on the surface as a mulch between crops.

CAPABILITY UNIT IIIw-2

Bude silt loam is the only soil in this unit. It is a somewhat poorly drained, strongly acid soil that has a fragipan. The subsoil is heavy silt loam or silty clay loam. Slopes are 0 to 2 percent.

The content of organic matter is low in this soil, and natural fertility is moderate. Infiltration is slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan.

If this soil is well managed, it is suited to corn, small grains, soybeans, common bermudagrass, Coastal bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, vetch, common lespedeza, and white clover. It is also suited to pine trees, sweetgum, yellow-poplar, and cherrybark oak.

Removing excess water is the chief concern of management. Row crops can be grown continuously, however, if crop rows are designed to carry excess surface water to properly constructed outlets and other measures are used to provide adequate drainage. Field ditches are needed in places, and diversion ditches can be used to prevent water from nearby hillsides from flowing across these soils. All crop residues should be returned to the soils.

CAPABILITY UNIT IIIw-3

Leeper silty clay is the only soil in this unit. It is a somewhat poorly drained, neutral to moderately alkaline soil that formed in alluvium. The surface layer and subsoil are silty clay.

The content of organic matter and natural fertility are moderate in this soil. Infiltration and permeability are slow, and available water capacity is high. When this soil dries it shrinks and cracks.

If this soil is well managed, it is well suited to oats, corn, soybeans, and sorghum. It is suited to such legumes as wild winter peas, vetch, lespedeza, and white clover, and it is well suited to such grasses as bermudagrass, johnsongrass, dallisgrass, bahiagrass, and tall fescue. It is well suited to hardwoods.

Row crops can be grown continuously on this soil, or they can be grown in a cropping system that alternates grasses and legumes or a mixture of grasses and legumes. Surface water and flooding are the main hazards. Except where flooding and scouring are severe, seedbeds should be prepared in fall to allow time before planting for the beds to settle. Wetness sometimes delays spring planting. Graded rows, field ditches, and field laterals can be used to drain off the excess surface water. In some places diversion terraces are needed to divert water from hillsides away from this soil.

CAPABILITY UNIT IVe-1

This unit consists of moderately well drained, strongly acid to very strongly acid soils in the Providence and Tippah series. These soils are on uplands and are severely eroded. The Providence soils have a fragipan at a depth of about 14 to 26 inches. The surface layer of these soils is silt loam to heavy silt loam, and the subsoil is silty clay loam or clay loam to clay. Slopes are 2 to 8 percent.

The content of organic matter is low in these soils, and natural fertility is moderate. Available water capacity is moderate, and infiltration is slow. Permeability is moderate in the upper part of the subsoil but slow in the fragipan. The fragipan retards the growth of roots.

If these soils are well managed, they are suited to most pasture plants, sorghum, small grains, common bermudagrass, Coastal bermudagrass, johnsongrass, bahiagrass, fescue, common lespedeza, sericea lespedeza, crimson clover, white clover, and sudangrass. Pine trees are well suited.

Terracing, stripcropping, and contour tillage reduce the speed of runoff and thus help to control erosion. These soils should be kept in perennial vegetation most of the time, and such vegetation should be grown continuously on areas cultivated and left unprotected.

CAPABILITY UNIT IVw-1

Henry silt loam is the only soil in this capability unit. It is a poorly drained, strongly acid soil that has a fragipan at a depth of about 20 inches. The subsoil is silty clay loam in the upper part. Slopes are 0 to 2 percent.

The content of organic matter and natural fertility are low in this soil. Available water capacity is moderate.

This soil is wet in winter and droughty in summer and is not well suited to row crops. It can be used, however, for pasture plants and trees. It is well suited to such grasses as bermudagrass, tall fescue, dallisgrass, and bahiagrass, and it is suited to such legumes as wild winter peas and white clover. This soil is well suited to pines and to some hardwoods.

Removing water from the surface of this soil is a problem. Constructing field ditches and arranging crops in rows that speed the flow of water to these ditches helps to alleviate the problem.

CAPABILITY UNIT IVw-2

This unit consists of somewhat poorly drained to poorly drained, strongly acid to very strongly acid soils of the Arkabutla, Mantachie, Rosebloom, and Wehadkee series. These soils formed in alluvium. The surface layer ranges from fine sandy loam to silty clay loam, and the subsoil ranges from sandy loam to silty clay loam. Slopes are 0 to 2 percent.

The content of organic matter is low in these soils, and natural fertility is moderate to low. Available water capacity is moderate to high, and infiltration and permeability are moderate to slow. Without vegetation for cover, the surface of these soils packs down and forms a crust.

If these soils are well managed, they are well suited to Coastal bermudagrass, common bermudagrass, tall fescue, dallisgrass, bahiagrass, common lespedeza, white clover, and some hardwoods.

Crops on soils of this unit are subject to severe damage by flooding, and removing surface water is the chief concern of management. Crop rows should be designed so that they drain to a properly constructed outlet. Drainage laterals and field ditches are needed. Diversion terraces can be used to divert water from the hillsides and keep it from flowing across these soils.

CAPABILITY UNIT VIe-1

Shubuta clay loam, 8 to 12 percent slopes, severely eroded, is the only soil in this unit. It is a well-drained, strongly acid soil and is in upland areas. The subsoil is heavy clay loam to clay.

The content of organic matter and natural fertility are low in this soil. Infiltration is slow, and permeability and available water capacity are moderate.

This soil generally is not suited to row crops. It is suited to pasture plants, however, and is well suited to pine trees. Bermudagrass and bahiagrass are suitable grasses, and lespedeza and crimson clover are suitable legumes. Close-growing plants should be kept on this soil since they help to reduce erosion. Pastures should not be overgrazed, and wooded areas should be protected from overgrazing and fire.

CAPABILITY UNIT VIe-2

This unit consists of moderately well drained, strongly acid soils in the Ora and Shubuta series. These soils are on uplands. Slopes range from 5 to 12 percent. In some areas erosion is severe, but the extent of erosion varies from place to place. The surface layer is silt loam to fine sandy loam, and the subsoil is loam to clay.

The content of organic matter and natural fertility are low to moderate in these soils. Available water capacity is moderate, and infiltration and permeability are variable.

These soils are suited to bermudagrass, bahiagrass, common lespedeza, sericea lespedeza, and crimson clover. They are also suited to pine trees.

Pastures on these soils should be protected from overgrazing. The wooded areas should be protected from fire.

CAPABILITY UNIT VIe-3

Sumter-Oktibbeha complex, 12 to 17 percent slopes, eroded, makes up this unit. These soils are acid to alkaline and are in upland areas. The surface layer is silty clay to silty clay loam, and the subsoil is clay.

The content of organic matter and natural fertility are low in these soils. Infiltration is slow, permeability is slow to very slow, and available water capacity is moderate.

The individual soils in this complex differ somewhat in characteristics but are suited to about the same uses. They are susceptible to further erosion and require similar management. Keeping a cover of perennial plants on the areas increases infiltration. In this way runoff is reduced and the hazard of further erosion is decreased. Pastured areas on these soils should not be overgrazed.

CAPABILITY UNIT VIIe-1

This unit consists of strongly acid to very strongly acid soils in the Cahaba, Linker, Ruston, and Shubuta series. These soils vary in extent and distribution and do not occur in a consistent pattern. The surface layer ranges from fine sandy loam to loam, and the subsoil ranges from sandy loam to clay loam.

The content of organic matter and natural fertility are moderate to low in these soils. Available water capacity is low to moderate, and infiltration and permeability are variable.

Soils in this unit are suited to pine trees. They are highly susceptible to erosion and need a permanent cover of vegetation. Pastures should not be overgrazed, and wooded areas need to be protected from fire.

CAPABILITY UNIT VIIe-2

Only Gullied land-Ruston complex, 8 to 40 percent slopes, is in this unit. It is made up of an intricate pattern of gullies that have areas of Ruston and Ora soils between the gullies. The soil materials range from silt loam to sandy clay in texture and are acid. Content of organic matter and natural fertility vary in soils of this unit. Infiltration and permeability also vary. Runoff is high, and available water capacity is moderate.

Most of the acreage in this unit is wooded. The soils are well suited to pine trees, and a well-managed stand of pine trees generally is needed to stabilize the soil material and reduce the erosion hazard. All areas should be protected from fire and from overgrazing.

CAPABILITY UNIT VIIe-3

Only Sumter-Gullied land complex, 8 to 25 percent slopes, is in this unit. It is made up of gullies that generally are separated by Sumter soils. All of the soil layers have been washed away in the gullies but are still present in the Sumter soils. The soil material is alkaline. Infiltration and permeability are slow in this unit, and available water capacity is moderate.

This unit is well suited to pasture plants and cedar trees. Keeping a cover of trees or pasture plants on the areas helps to prevent further erosion. Wooded areas require protection from fire and from grazing.

Estimated yields

The soils in Alcorn County vary widely in productivity. Some soils consistently produce high yields of cultivated crops; others are better suited to less intensive use.

Table 2 shows, for the arable soils in the county, estimated average yields of the crops commonly grown. The estimates are those obtained under a high level of management that does not include irrigation. They are based on estimates by agronomists, soil scientists, and others who have had much experience with the crops and soils of the county. Data of yields obtained by experiments were adjusted to reflect the combined influence of slope and management. If data from experiments were not available, estimates were made by using available data for similar soils.

The following practices of high-level management were assumed in estimating the yields given in table 2:

1. Fertilizer and lime applied according to the needs indicated by the results of soil tests.
2. Proper tillage and use of crop residues to the best advantage.
3. Planting or seeding by suitable methods at suitable rates.
4. Use of soil-conserving cropping sequences.
5. Other conservation practices as suggested in the section on capability units.

Estimates were not made for those soils that are not suited to the specified crops. They also were not made for crops that generally are not grown in the county or for crops grown only on a small acreage.

Use of the Soils as Woodland [2]

In this section the principal kinds of trees in the county and where they grow are briefly discussed. The soils are placed in woodland suitability groups, and the factors that determined the grouping are explained. Each woodland group is then discussed.

When settlement first began in the county, most uplands had a dense cover of shortleaf pine and of oak, chestnut, hickory, and other hardwoods. Along the creek bottoms were wide, swampy areas covered by dense stands of gum, oak, and beech that had a dense undergrowth of vines and canes. Native grasses covered small areas of calcareous soil and afforded good grazing (*5*).

Much of the land first cleared and farmed reverted to forest when labor became scarce in the 1860's. Soon industrialized lumbering began. In 1879 a firm was established that manufactured sawmills, boilers, steam engines, and other items related to lumbering. The first large concern for manufacturing lumber was built in 1899.

As late as 1920 about half of the county was uncleared bottom land or land recently cut over by lumbermen. In the western part of the county the area known as Hatchie

[2] By JOSEPH V. ZARY, woodland conservationist, Soil Conservation Service.

TABLE 2.—*Estimated average yields per acre of principal crops under a high level of management*

[Absence of yield indicates crop is not commonly grown on the particular soil]

Soil [1]	Cotton lint	Corn	Oats	Soybeans	Hay: Coastal bermudagrass and legumes	Hay: Lespedeza	Pasture: Bahiagrass and legumes	Pasture: Common bermudagrass and legumes	Pasture: Fescue and legumes
	Lbs.	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Cow-acre-days* [2]	*Cow-acre-days* [2]	*Cow-acre-days* [2]
Arkabutla silt loam	650	85	65	32	-	2.0	315	213	267
Bude silt loam	430	45	55	22	3.5	1.5	165	138	200
Henry silt loam	425	42	50	22	-	1.3	-	117	-
Leeper silty clay	650	75	-	30	-	-	-	135	162
Mantachie fine sandy loam	600	75	60	32	5.0	1.7	315	213	267
Ora fine sandy loam, 2 to 5 percent slopes, eroded	600	55	60	22	3.5	1.3	201	141	180
Ora fine sandy loam, 5 to 12 percent slopes, severely eroded	425	-	-	-	2.5	1.7	141	108	-
Ora-Shubuta complex, 8 to 12 percent slopes	-	-	-	-	-	-	[3] 141	[3] 108	-
Paden silt loam, 0 to 2 percent slopes	650	80	65	33	-	1.7	201	141	190
Paden silt loam, 2 to 5 percent slopes	600	75	70	30	-	1.7	201	141	207
Providence silt loam, 2 to 5 percent slops, severely eroded	500	50	48	25	-	1.5	141	108	-
Providence silt loam, 5 to 8 percent slopes	450	45	70	20	-	1.5	201	141	-
Providence silt loam, 5 to 8 percent slopes, severely eroded	450	45	50	20	-	1.3	141	108	-
Providence silt loam, heavy substratum, 2 to 5 percent slopes, severely eroded	550	60	65	25	-	1.5	141	108	-
Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	500	50	50	20	-	1.5	141	108	-
Rosebloom silt loam	525	60	55	30	-	1.5	-	155	-
Rosebloom-Arkabutla association, frequently flooded	525	60	55	30	-	1.5	-	[3] 155	-
Ruston fine sandy loam, 5 to 8 percent slopes	650	60	60	-	9.0	1.6	207	144	-
Shubuta loam, 2 to 5 percent slopes, eroded	475	45	50	20	4.3	1.3	213	171	144
Shubuta clay loam, 8 to 12 percent slopes, severely eroded	-	-	-	-	-	-	141	108	-
Sumter-Gullied land complex, 8 to 25 percent slopes	-	-	-	-	-	-	[3] 90	[3] 108	-
Sumter-Oktibbeha complex, 12 to 17 percent slopes, eroded	-	-	-	-	-	-	-	[3] 105	-
Tippah-Providence complex, 2 to 8 percent slopes, severely eroded	500	50	60	20	-	1.5	-	[3] 150	-
Trinity silty clay	750	90	80	30	-	1.3	-	135	162
Wehadkee-Mantachie association, frequently flooded	-	-	-	-	-	-	-	[3] 155	[3] 174
Wehadkee-Mantachie complex	-	-	-	-	-	-	174	155	[3] 174

[1] Only soils that are generally used for crops or pasture are included in this table.

[2] Cow-acre-days is the number of days in a year that one animal unit (one cow, steer, or horse; five hogs; seven sheep; or seven goats) can graze 1 acre without injury to the pasture.

[3] Yields vary widely because the soils have variable characteristics.

Hills had a cover of shortleaf pine mixed with oak and hickory. In 1939 the county had nearly 119,000 acres of potential woodland (*15*). Hardwoods were dominant in the central part of the county on the fertile bottom-land soils, and pines were dominant in the eastern and western parts on upland soils.

In 1957 more than half of the acreage in the county was commercial woodland (*13*). The total volume of sawtimber at that time was more than 100 million board feet. About four-fifths of this was hardwood, and the remainder was softwood. Presently there are seven sawmills in the county. Each has an annual output of nearly 3 million board feet (*10*).

Red oak is the most important commercial hardwood in the county, and white oak is the next. Sweetgum is the most widely distributed hardwood and ranks next to the oaks in commercial value. Other important hardwoods are American elm, willow, hickory, cottonwood, yellow-poplar, sycamore, ash, tupelo, and blackgum.

Shortleaf pine is the typical woodland tree in the county and the most widely distributed softwood. It has a higher commercial value than any of the other softwoods. Others that have commercial value are loblolly pine, cypress, and redcedar (*4*).

Several fruit- and nut-bearing trees in the county have economic value and also produce food for birds and animals. These are red mulberry, black cherry, persimmon, pecan, crabapple, and wild plum.

Forest types

Forest type is a term used for stands of trees that are similar in composition and development but differ from other stands because of their ecology (*8*). A forest type generally is given the name of the tree or trees that are dominant in the stand. The following lists the forest types on woodland in the county and the number of acres occupied by each.

Forest type:	*Acres*
Oak-hickory	48, 500
Oak-pine	44, 800
Oak-gum-cypress and elm-ash-cottonwood	22, 400
Loblolly-shortleaf pine	18, 600
Total	134, 300

In the oak-hickory forest type, 50 percent or more of the stand is upland oaks or hickory, alone or mixed. Common associates are yellow-poplar, elm, maple, and black walnut. This forest type is in a belt that extends from the south-central part of the county to the north-central and northeastern parts. It generally is on soils of the Providence and Paden series and on the Tippah-Providence complex. Small areas are on the Bude and Henry soils.

In the oak-pine forest type, 50 percent of the stand or more is hardwoods, generally upland oaks, and 25 to 49 percent is southern pines. Common associates are gum, hickory, and yellow-poplar. This forest type is in the uplands. Some areas are on Cahaba-Ruston association, hilly, in the southeastern and east-central parts of the county. Others are on Ruston-Shubuta-Linker association, hilly, in the western third of the county in the area known as Hatchie Hills.

The oak-gum-cypress forest type is on bottom lands. At least 40 percent of the stand is tupelo, blackgum, sweetgum, oak, or southern cypress, alone or mixed. Common associates are cottonwood, willow, ash, elm, hackberry, and maple. The oak-gum-cypress forest type generally is on soils of the Rosebloom and Arkabutla series; on Wehadkee-Mantachie association, frequently flooded; and on Rosebloom-Arkabutla association, frequently flooded. The areas are along the Tuscumbia River and its main tributaries and along Sevenmile and Chambers Creeks.

The elm-ash-cottonwood forest type also is on bottom lands. In this forest type 50 percent or more of the stand is elm, ash, or cottonwood, alone or mixed. Common associates are willow, sycamore, beech, and maple. The elm-ash-cottonwood forest type is on essentially the same soils as the oak-gum-cypress type, but it occupies considerably less area.

The loblolly-shortleaf pine forest type is on uplands. In this forest type, 50 percent or more of the stand is loblolly pine, shortleaf pine, and other southern yellow pines except longleaf and slash pine. The stand may be pure mixed. Common associates are oak, hickory, and gum. Areas of this forest type and of the oak-pine forest type commonly are intermingled. The loblolly-shortleaf pine forest type is in the southeastern and central-eastern parts of the county on soils of the Cahaba-Ruston association and in the northwestern part on Ruston-Shubuta-Linker association, hilly.

Woodland suitability grouping

The soils in Alcorn County have been placed in woodland groups to help the farmer plan use and management of his woodland. Each group is made up of soils that have about the same suitability for wood crops, require about the same management, and have about the same potential productivity. These groupings were based on factors given in the following paragraphs.

The potential productivity of a soil for a kind of tree is expressed as the *site index*. For each woodland suitability group, the site index that is given for all trees except cottonwood is the average height, in feet, of the dominant and codominant trees at 50 years of age. For cottonwood, the site index is the average height at 30 years.

The site index was estimated after studying the growth of trees on woodland in this county and in other counties where the soils are similar. The growth of special kinds of trees was observed on a specified kind of soil. As nearly as possible, the studies were confined to well-stocked, naturally occurring, even-aged, unmanaged stands that have not been damaged by fire, insects, disease, or grazing livestock. For some species of trees, sites suitable for measurement were not available on all kinds of soils in the county. The site indexes were estimated for those trees by using data on the site index for similar soils.

Hazards and limitations to tree production that are significant to management are rated slight, moderate, and severe. These are explained in the paragraphs that follow. The ratings are for woodland on which normal management and harvesting are practiced.

Seedling mortality.—This term refers to the expected loss of planted seedlings as the result of unfavorable soil or topographic conditions when plant competition is not a limiting factor. Normal rainfall, good planting stock, and proper planting are assumed. Depth to water table, flooding, drainage, soil depth and texture, and degree of erosion were considered in the ratings. Seedling mortality is *slight* if losses of less than 25 percent are expected; *moderate*, if expected losses are between 25 and 50 percent; and *severe*, if losses of more than 50 percent of the planted stock can be expected.

Plant competition.—This term refers to the degree that unwanted trees, shrubs, vines, and grasses are likely to invade when openings are made in the canopy. Plant competition is *slight* if undesirable plants do not prevent adequate natural regeneration and early growth, or do not interfere with the growth of planted seedlings. It is *moderate* if competing plants delay but do not prevent establishment of a normal, fully stocked stand by natural regeneration or from planted seedlings. Competition is *severe* where natural or artificial regeneration is not adequate unless special practices, including weeding, are used in preparing and maintaining the site.

Equipment limitations.—Steep slopes, stones, and excess water limit the use of ordinary equipment in planting and harvesting wood crops and in other woodland management. The rating is *slight* if there is little or no restriction on the type of equipment that can be used or the time of year it can be used. The rating is *moderate* if the use of equipment is restricted by slope, stones or other obstructions, by seasonal wetness, or if the equipment injures the trees or their roots. The rating is *severe* if special equipment is needed or the use of such equipment is severely restricted by one or more unfavorable soil characteristic.

Erosion hazard.—The hazard of erosion is the degree of potential soil erosion if normal woodland management and harvesting practices are used. Considered in making the ratings were slope and erodibility of the soil. A rating of *slight* means no special problems; of *moderate*, that some care is needed; and of *severe*, that special practices or methods of operation are needed to reduce loss of soil.

Windthrow hazard.—This term refers to characteristics of the soil that affect growth of tree roots and the firmness with which the roots hold the tree and resist the force of the wind. Root growth is impeded in places by a high water table or an impermeable layer. The protection from surrounding trees also affects windthrow hazard. Knowing the degree of windthrow hazard is important in determining the best trees to plant and in planning release cuttings and harvest cuttings.

The windthrow hazard is *slight* if roots hold the tree firmly against a normal wind and individual trees are likely to remain standing even if protective trees on all sides are removed. The hazard is *moderate* if the roots hold the tree firmly except when the soil is excessively wet and the wind is high. It is *severe* if roots do not provide adequate stability and individual trees are likely to be blown over if they are released on all sides.

In the following pages the woodland groups in this county are described. Given for each group are potential productivity of the soils, the trees preferred for planting and to favor in existing stands, site indexes for specified trees, and limitations of the soils that affect woodland management. The names of soil series represented are mentioned in the description of each group, but this does not mean that all soils of a given series are in that group. The names of all soils in any given woodland group can be found by referring to the "Guide to Mapping Units" at the back of this survey.

WOODLAND GROUP 1

This group consists of somewhat poorly drained to poorly drained soils of the Arkabutla and Rosebloom series. These soils formed on alluvium. They are on first bottoms, just above stream channels that are subject to overflow. The surface layer is silt loam to silty clay loam, and the subsoil is silty clay loam to sandy clay loam. Slopes range from 0 to 2 percent.

Soils of this group are suited to many kinds of desirable and valuable hardwoods. Species that should be favored in existing stands are green ash, white ash, cherrybark oak, Nuttall oak, overcup oak, swamp chestnut oak, water oak, willow oak, magnolia, sweetgum, and sycamore (*3*). Preferred species for planting are green ash, cherrybark oak, Nuttall oak, willow oak, and sweetgum.

Potential productivity is excellent for soils in this group. Site indexes are slightly under 100 for cherrybark oak and sweetgum and 100 for loblolly pine. The estimated yearly growth rate per acre (Doyle rule) for loblolly pine is 460 board feet or 1.68 standard cords of pulpwood.

Plant competition is moderate and does not hinder growth of desirable trees. In places, however, flooding delays regeneration and slows initial growth.

Equipment limitations are moderate to severe. Logging and other woodland operations are likely to be restricted for short periods of flooding.

The erosion hazard is slight on these soils.

WOODLAND GROUP 2

This group consists of somewhat poorly drained to moderately well drained, neutral to alkaline soils of the Leeper and Trinity series. These soils formed on alluvium. The surface layer is silty clay to silty clay loam, and the subsoil is silty clay to clay. Slopes are 0 to 2 percent.

Permeability and internal drainage are slow in these soils. Available water capacity is high.

The soils in this group are suited to green ash, white ash, cottonwood, hackberry, sugarberry, sweetgum, and sycamore, and these trees should be favored in existing stands. Preferred species for planting are green ash, white ash, cottonwood, and sweetgum.

Potential productivity is good for soils in this group. Site indexes are slightly more than 100 for cottonwood and about 90 for sweetgum.

Plant competition is moderate to severe. Growth of unwanted trees, shrubs, and vines must be controlled so that desirable species will survive and grow.

Seedling mortality is moderate to severe. In low areas water stands on the areas in wet years and kills seedlings.

Equipment limitation also is moderate to severe. Frequent flooding makes logging and other woodland operations difficult on these clayey soils. As a result, work can be done in the woodlands only during dry periods.

The erosion hazard is slight on these soils.

WOODLAND GROUP 3

This group consists of somewhat poorly drained to poorly drained soils of the Mantachie and Wehadkee series. These soils formed on alluvium. They are on first bottoms, just above stream channels that are subject to overflow. The surface layer is fine sandy loam to silt loam, and the subsurface layer is silty clay loam. Slopes range from 0 to 2 percent.

Permeability and internal drainage are moderate to slow in soils of this group. Available water capacity is moderate.

These soils are well suited to cottonwood, laurel oak, swamp chestnut oak, cherrybark oak, Nuttall oak, water oak, white oak, willow oak, sweetgum, sycamore, black tupelo, and yellow-poplar. These trees should be favored in existing stands. Preferred species for planting are cherrybark oak, sweetgum, sycamore, and yellow-poplar.

Potential productivity is excellent for soils in this group. Site indexes are 95 to 105 for sweetgum, 94 to 104 for cherrybark oak, 100 for loblolly pine, and 95 to 105 for cottonwood. The estimated yearly growth rate per acre (Doyle rule) for loblolly pine is 460 board feet or 1.68 standard cords of pulpwood.

Plant competition is moderate to severe. Seedling mortality is moderate, and in places frequent flooding impedes regeneration.

Equipment limitations are moderate. Logging and other woodland operations are likely to be restricted for short periods because of flooding or wetness.

The erosion hazard is slight on these soils.

WOODLAND GROUP 4

This group consists of acid and alkaline soils that formed on chalk. It consists of Gullied land and of Oktibbeha and Sumter soils. The surface layer and subsoil are silty clay loam to clay. Depth to chalk or marly clay is

2 to 5 feet. Slopes range from 8 to 25 percent. Permeability and internal drainage are slow.

Acid soils in this group are well suited to cherrybark oak, sweetgum, loblolly pine, and shortleaf pine. These trees should be favored in the existing stands. Loblolly pine is preferred for planting.

Alkaline soils in this group are suited to eastern redcedar. This tree should be favored in existing stands. It also is preferred for planting. It generally is used for Christmas trees and for fence posts.

Potential productivity is fair for soils in this group. Site indexes are 80 for loblolly pine, 70 for shortleaf pine, and 50 for redcedar. The estimated yearly growth rate for loblolly pine is 230 board feet per acre (Doyle rule) or 1.2 standard cords of pulpwood. The estimated yearly growth rate per acre (Doyle rule) for shortleaf pine is 173 board feet.

Seedling mortality generally is slight for the acid soils and moderate to severe for the alkaline soils. Plant competition is moderate for the acid soils and severe for the alkaline soils. Competing plants delay natural regeneration and impede initial growth in acid soils.

Equipment limitations are moderate on the acid soils and moderate to severe on the alkaline soils. Conventional logging equipment can be used only in dry periods on both the alkaline and acid soils.

The hazard of erosion is severe on soils of this group.

WOODLAND GROUP 5

This group consists of somewhat poorly drained to poorly drained soils of the Bude and Henry series. These soils have a fragipan at a shallow depth. The surface layer is silt loam, and the subsoil is silty clay loam to silt loam. Slopes range from 0 to 2 percent.

Permeability and internal drainage are moderate to slow in soils of this group. Available water capacity is moderate to low.

Soils of this group are well suited to cherrybark oak, Shumard oak, water oak, white oak, sweetgum, and loblolly pine. These trees should be favored in existing stands. Green ash, cherrybark oak, sweetgum, loblolly pine, and shortleaf pine are preferred trees for planting.

Potential productivity is good in soils of this group. Site indexes are 80 to 90 for cherrybark oak, 70 to 80 for sweetgum, and 85 to 95 for loblolly pine. The estimated yearly growth rate per acre (Doyle rule) for loblolly pine is 330 board feet or 1.42 standard cords of pulpwood.

Seedling mortality is moderate on these soils. Plant competition is moderate on the somewhat poorly drained soils and severe on the poorly drained ones.

Equipment limitations are moderate on the somewhat poorly drained soils, and operation of conventional equipment therefore is limited to dry periods. On the poorly drained soils equipment limitations are severe. Water stands in ponds on the poorly drained soils for a considerable time after a rain.

WOODLAND GROUP 6

This group consists of well drained to moderately well drained soils of the Ora, Ruston, and Shubuta series. These soils are on uplands. The surface layer is loam or fine sandy loam, but the subsoil is finer textured. The Ora soils have a fragipan at a depth of 18 to 24 inches. Slopes range from 2 to 8 percent.

Permeability is moderate to slow in soils of this group. Available water capacity is moderate.

The soils in this group are well suited to cherrybark oak, Shumard oak, southern red oak, white oak, sweetgum, black tupelo, yellow-poplar, and loblolly pine. Cherrybark oak, sweetgum, and loblolly pine are preferred for planting.

Potential productivity is good in soils of this group. Site indexes are 80 to 90 for loblolly pine, 65 to 75 for sweetgum, and 55 to 65 for red oak. The yearly growth rate per acre (Doyle rule) for loblolly pine is 280 board feet or 1.31 standard cords of pulpwood. Seedling mortality is slight to moderate on these soils. Commercial hardwoods grow well only on the less sloping areas. Plant competition is moderate.

Equipment limitations generally are slight. During long periods of heavy rain, however, limitations to use of equipment are moderate.

The erosion hazard is slight on slopes of 2 to 5 percent and moderate on slopes of 5 to 8 percent. The windthrow hazard generally is slight.

WOODLAND GROUP 7

This group consists of moderately well drained upland soils that have a fragipan. These soils are in the Paden and Providence series. The surface layer is silt loam, and the subsoil is clay loam to heavy silt loam. Slopes range from 0 to 8 percent.

Permeability and internal drainage are moderate above the fragipan. Available water capacity is moderate.

Trees that should be favored in existing stands are cherrybark oak, Shumard oak, southern red oak, white oak, sweetgum, sycamore, and yellow-poplar. Preferred species for planting are cherrybark oak, sweetgum, yellow-poplar, and loblolly pine.

Potential productivity is good for hardwood on soils of this group, and it is fair to good for pine. Site indexes are 80 to 90 for cherrybark oak, 75 to 85 for sweetgum, 75 to 85 for loblolly pine, and 65 to 75 for shortleaf pine. The estimated yearly growth per acre (Doyle rule) for loblolly pine is 230 board feet or 1.2 standard cords of pulpwood. For shortleaf pine the estimated yearly growth per acre (Doyle rule) is 173 board feet.

Seedling mortality is slight to moderate. Plant competition is moderate. Competing plants are likely to delay natural regeneration of favored species and retard initial growth.

Equipment limitations are slight to moderate. No serious problems are encountered in logging or hauling except in extremely wet periods.

The erosion hazard generally is moderate on slopes up to 5 percent, but it is severe in places on unprotected slopes of 5 to 8 percent. The windthrow hazard is slight to moderate because of the fragipan.

WOODLAND GROUP 8

This group consists of moderately well drained to well drained soils of the Ora, Providence, Shubuta, and Tippah series. These soils are on uplands. The surface layer is fine sandy loam, silt loam, or clay loam. The subsoil is loam, silty clay loam, clay loam, or clay. Root penetration is moderately deep to deep. Slopes range from 2 to 12 percent.

Permeability is moderate to slow in soils of this group. Available water capacity is moderate.

Shortleaf pine and loblolly pine are the trees to favor in existing stands. Loblolly pine is the preferred species for planting. Because of the erosion hazard, hardwoods are not suitable for planting.

Potential productivity for soils in this group is good. Plant competition and seedling mortality are slight to moderate. Site indexes are 80 to 90 for loblolly pine and 60 to 70 for shortleaf pine. The estimated yearly growth rate per acre (Doyle rule) for loblolly pine is 280 board feet or 1.31 standard cords of pulpwood. The estimated growth rate per acre (Doyle rule) for shortleaf pine is 165 board feet.

Equipment limitations are moderate on soils of this group.

The erosion hazard is moderate on slopes of 5 to 8 percent and severe on slopes of 8 to 12 percent. In some places all of the surface soil has been washed away.

WOODLAND GROUP 9

This group consists of well drained to moderately well drained soils of the Cahaba, Linker, Ora, Ruston, and Shubuta series. These soils have a surface layer of sandy loam to silt loam and a subsoil of loam to clay. Slopes range from 8 to 40 percent.

The available water capacity is moderate to low in soils of this group.

Soils of this group are suited to pines, particularly loblolly pine (fig. 5), which is the species best suited to planting. Hardwoods such as cherrybark oak, Shumard oak, southern red oak, white oak, sweetgum, and black tupelo are favored for lower slopes only. Yellow-poplar is suited to lower slopes and to sites that are moist and have northern and eastern exposures. Cherrybark oak and sweetgum should be planted only on lower slopes. Black walnut is suited to moist, fertile sites.

Potential soil productivity is good in soils of this group. Site indexes are 80 to 90 for loblolly pine, 60 to 70 for shortleaf pine, 70 for sweetgum, and 60 for red oak. The estimated yearly growth rate per acre (Doyle rule) for loblolly pine is 265 board feet or 1.27 standard cords of pulpwood. It is 145 board feet for shortleaf pine.

Seedling mortality and plant competition are slight to moderate.

Equipment limitations are slight on slopes of 0 to 8 percent and moderate on slopes that are more than 8 percent.

The erosion hazard is slight on slopes of 0 to 8 percent, moderate on slopes of 8 to 12 percent, and severe on slopes that exceed 12 percent.

The windthrow hazard generally is slight. It is moderate after thinning is done, however, in the soils that have a fragipan.

WOODLAND GROUP 10

Only Gullied land-Ruston complex, 8 to 40 percent slopes, is in this group. It consists of severely eroded areas in an intricate pattern of gullies that are 3 to 6 feet deep. In the gullies the original surface layer and subsoil have been completely removed by erosion. Between gullies are areas of deep, well-drained soils that have a sandy clay loam or loam surface layer and a loam to sandy clay loam subsoil.

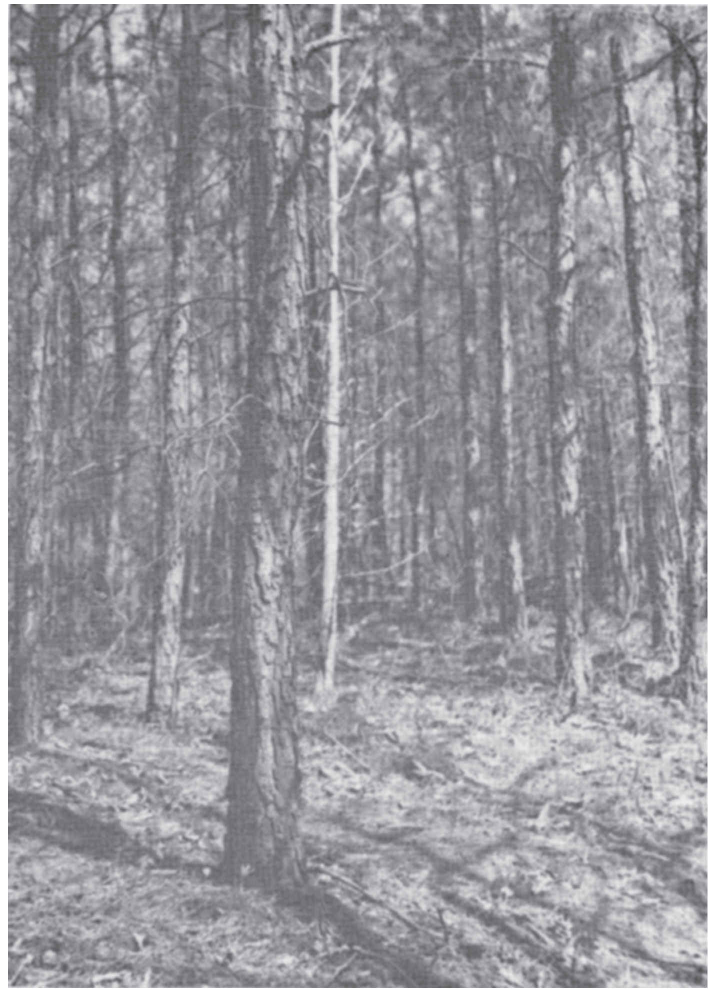

Figure 5.—**Loblolly pine plantation on Cahaba-Ruston association, hilly, in woodland group 9.**

Loblolly pine and shortleaf pines are the trees that should be favored in stands. Loblolly pine is the tree preferred for planting. It survives well and grows fast, and it produces a heavy needle cast that helps to heal gullied and eroded areas.

Potential productivity is fair in soils of this group. Site indexes are 75 for loblolly pine and 65 for shortleaf pine. The estimated yearly growth rate per acre (Doyle rule) for loblolly pine is 230 board feet or 1.1 standard cords of pulpwood. It is 135 board feet for shortleaf pine.

Seedling mortality is moderate to severe on this soil. Large numbers of seedlings planted in actively eroding gullies can be expected to be lost. Loss of seedlings planted in the areas between the gullies is moderate.

Plant competition is slight to moderate.

Equipment limitations are moderate on slopes of 12 percent or less and severe on steeper slopes. Gullies impose severe equipment limitations. Locations of roads and skid trails for removing timber must be carefully selected.

Use of the Soils for Wildlife and Fish [3]

In this section the wildlife resources of Alcorn County and the kinds and needs of the wildlife and fish that inhabit the county are discussed.

The kinds of plants and the use of the soils determine the kinds and numbers of wildlife that live in an area. Some kinds of wildlife prefer woodland, some prefer marshland, and others prefer open farmland. Most kinds of wildlife, however, need a combination of these.

The kinds of soil in an area affect the vegetation that grows. In turn, the vegetation greatly influences the kind of wildlife that lives in an area. The soils and the plants growing on them also affect the quality and quantity of water in a pond or stream and its ability to produce fish.

All of the soils in this county are suited to one or more kinds of wildlife. Some soils support one kind of wildlife, and some support another. The local representative of the Soil Conservation Service can be consulted for help in planning a wildlife program suitable for the kinds of wildlife and fish a landowner wishes to encourage.

Changing patterns of wildlife have affected the kinds and numbers of wildlife in the county. In the early days of settlement, trees covered most of the county and the streams were free of such pollutants as silt. Deer, turkeys, squirrels, and other woodland wildlife were abundant, and fish were plentiful in the streams. As the land was cleared for farming, the woodland game decreased in number because their habitat was gone. They were replaced by bobwhite, doves, rabbits, and many kinds of songbirds that were better adapted to semiopen areas. These animals and birds flourished because the farming practiced produced a habitat suitable for them.

Poor farming practices caused the soils to erode in many areas, and silt and sand poured into the streams. The number of fish declined somewhat, especially in the smaller streams. Some of the larger streams in wooded areas still provide good fishing. As drainage and clearing of the bottom lands continue, however, the number of fish the streams can provide will further decrease.

Recent trends in land use have continued to change the kinds and numbers of wildlife in the county. Because of reforestation and use of good practices in managing the forest, many forest game species are coming back. Modern practices of farming have destroyed much of the natural vegetation that provided food and cover for wildlife. It therefore is necessary for the farmer to plant suitable vegetation and to use practices that will help to maintain some of the natural food plants. Future use of the soils and game management practices will determine the kinds and numbers of game and fish in the county.

Requirements of game and fish

Bobwhite quail.—These birds need open and semiopen areas in which foods are available near vegetation that provides protection from predators and adverse weather. Areas of row-crop farming generally provide such a habitat. Choice food for quail are acorns; beechnuts; blackberries; browntop and Texas millets; black cherries; corn; cowpes; flowering dogwood; bicolor, Kobe, Korean, and common lespedezas; mulberries; pine seed; partridgepeas; ragweed; soybeans; sweetgum seed; and tickclover (beggartick). Quail also eat insects in warm seasons.

Deer.—Deer require wooded areas of 500 acres or more and a good supply of water. Some of their choice foods are acorns, clover, corn, cowpeas, greenbrier, honeysuckle, oats, fescue, and wheat. They also eat many other native forage plants.

Doves.—Doves need a daily supply of water and open fields without thick ground cover. Some of their choice foods are browntop millet, corn, croton, grain sorghum, panicgrass (several species), pine seed, pokeberry, ragweed, sweetgum seed, and wheat.

Ducks.—Ducks feed in areas of permanent water or areas that are flooded in winter. Some of their choice foods are acorns, beechnuts, corn, browntop and Japanese millets, and smartweed.

Rabbits.—Among the plants that provide good cover for rabbits are blackberries, multiflora rose, sericea lespedeza, and low-growing brush, shrubs, and annual weeds. Grass, clover, waste grain, and bark are their main foods.

Squirrels.—Squirrels require wooded areas that range from a few acres to larger tracts. Hardwoods supply food and are essential in the stand. Choice foods are acorns, beechnuts, black cherries, corn, hickory nuts, mulberries, pecans, and seeds of blackgum, dogwood, maple, and pine.

Nongame birds.—Many kinds of nongame birds live in Alcorn County. Their habitat and their foods vary. Some of the birds eat only insects, a few eat insects and fruits, and others eat insects, acorns, nuts, and fruits.

Fish.—The principal game fish in ponds and streams are bass, bluegills and other sunfish, and channel catfish. Bluegills and most of the sunfish eat aquatic worms, insects, and insect larvae. Bass and channel catfish feed on small fish, frogs, crayfish, and other aquatic animals. In ponds the amount of food for fish and the poundage of usable fish produced are related to the fertility of the water, watershed, and bottom of the pond. Most ponds in the county need fertilizer and lime for producing a large amount of fish.

Wildlife habitat areas

The soils in Alcorn County have been grouped in three wildlife habitat areas, each containing two or more associations. The soil associations are shown on the colored map at the back of this survey and are described in the section "General Soil Map."

The three wildlife habitat areas are described in the following paragraphs.

WILDLIFE HABITAT AREA 1

This area consists of the Ruston-Linker-Shubuta and the Cahaba-Ruston soil associations. The soils in these associations generally are on hilly uplands and narrow stream bottoms. Much of the area is in timber. Most of the farmland is on the ridges and along stream bottoms in farms that are small to medium in size.

Bobwhite quail, doves, and rabbits like open areas that have shelter nearby. Many kinds of plants grow naturally around the edges of fields in the county and provide food and cover. The soils in this area are suited to all of the food plants preferred by quail. Lespedeza, beggartick, partridgepeas, and wild beans provide abundant food for quail in places where shade and competition from other plants do not limit their growth. Millet grows well on the

[3] By EDWARD G. SULLIVAN, biologist, Soil Conservation Service.

soils of this area and can be planted for doves. Doves obtain much of their food from native grass seeds, wooly croton, and from the waste left after a crop is harvested. Doves need water daily and can obtain it from farm ponds.

The soil associations in this wildlife area generally are good habitat for forest game. There are enough hardwoods in the stands to furnish food for squirrels. The present stands provide fair food and cover for deer and turkeys. Under good woodland management the habitat will improve as the stands mature.

Because of the topography, few sites in this wildlife area can be developed as habitat for ducks or other waterfowl. Beavers have built a few ponds along streams in the area, and these are used by some waterfowl. Most of the soils are suitable as sites for ponds and lakes, and many farm ponds have been constructed. Under good management most of the ponds produce a good supply of fish.

WILDLIFE HABITAT AREA 2

This area consists of the Mantachie-Wehadkee and the Mantachie-Arkabutla-Rosebloom soil associations. Soils in these associations are mainly on wide stream bottoms along the Hatchie River. Much of the area is in row crops and pasture, but some parts are still in timber. Some of the poorly drained soils were once cleared but have since reverted to timber. Timber stands in this wildlife area are made up of many kinds of hardwoods.

Bobwhite quail live in this wildlife area, but the habitat is not so suitable for these birds as the other wildlife areas in the county. Because of intensive farming, the plants preferred by quail are not abundant even though the soils are well suited. Under good management native plants preferred by quail grow well and provide the necessary food and cover. Cultivated plants suitable for quail food grow well on all except the poorly drained soils.

Both swamp and cottontail rabbits are plentiful in this wildlife area where the cover is sufficient to protect them. Swamp rabbits like the hardwood forests along streams. Cottontail rabbits prefer open areas that have protective cover nearby. Many native plants grow along the edges of fields and on ditchbanks. If these plants are not disturbed, they provide suitable food and cover for rabbits.

Doves are plentiful in this wildlife area. They like to feed in open fields on grain and native grass seeds. Browntop millet grows well on the soils in this wildlife area and provides excellent food for doves.

The woodland in this wildlife area is excellent habitat for game. Many of the trees are hardwoods, which provide ample food for squirrels. The larger wooded tracts also provide food and cover for deer and turkeys. Clearing for farming, however, is reducing the size of the stands and thus reducing the acreage suitable for forest game.

Drainage and clearing of areas along stream bottoms have made many of these tracts unsuitable for waterfowl. A few suitable waterfowl areas remain, however, and others could be developed. The soils and topography are favorable for development of habitat for ducks and other waterfowl.

In this wildlife area, the topography limits the sites available for farm ponds. Most of the ponds should be dug out or of the levee type. During overflows undesirable kinds of fish may enter the ponds.

WILDLIFE HABITAT AREA 3

This area consists of the Paden-Bude-Henry and the Providence-Ora-Paden soil associations. Soils in these associations are nearly level to gently sloping. They are on ridges and narrow stream bottoms. Much of this area is in row crops and pasture.

The soils in this association provide excellent habitat for bobwhite quail, doves, and rabbits. Many kinds of cover plants grow naturally in the area and provide food and cover. Management is needed, however, to provide space for wildlife in areas that are farmed intensively. Doves thrive where corn, other grains, and seeds of native grasses and weeds are available for food. Browntop millet and other millets grow well on these soils and provide good food for doves.

Farming is intensive in this wildlife area, and the number of forest game is small. Wooded areas along small streams and on steep slopes provide fairly good habitat for forest game along with adjacent areas in wildlife habitat areas 1 and 2. These wooded areas, though small, are valuable for the variety and pattern of vegetation they support.

The only sites suitable for waterfowl habitat are beaver ponds on bottoms of small streams. Several plants suitable for duck food are adapted to these beaver ponds. Most of the soils, however, are suitable as sites for farm ponds. Under good management a large quantity of fish can be produced (fig. 6).

Engineering Use of the Soils

Soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, structures for erosion control, drainage systems, and sewage-disposal systems. Among the properties most important are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell potential, grain size, plasticity, and reaction. Depth to the water table, available water capacity, and topography are also important.

The information in this survey can be used to—

Figure 6.—**Lake built for wildlife and recreation and stocked with bass, bream, and catfish.**

1. Make soil and land-use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils in the planning of agricultural drainage systems, farm ponds, irrigation systems, terraces and diversions, and land leveling.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, airports, pipelines, and cables and in planning detailed investigations at the selected locations.
4. Locate probable sources of sand and gravel and other materials suitable for construction.
5. Correlate performance of engineering structures with soil mapping units, and thus develop information that will be useful in designing and maintaining the structures.
6. Determine the suitability of soil mapping units for cross-country movement of vehicles and construction equipment.
7. Supplement the information obtained from other published maps and reports and aerial photographs for the purpose of making maps and reports that can be used readily by engineers.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.

The engineering interpretations reported here do not eliminate the need for sampling and testing at the site of specific engineering projects involving heavy loads and where the excavations are deeper than the depths of layers here reported. Even in these situations, however, the soil map is useful for planning more detailed field investigations and for indicating the kinds of problems that can be expected.

Some terms used by soil scientists may be unfamiliar to engineers, and some words have different meanings in soil science than they have in engineering. Among the terms that have special meaning in soil science are gravel, sand, silt, clay, loam, surface soil, subsoil, and horizon. These and other terms are defined in the Glossary at the back of this survey.

Much of the information in this section is given in tables 3, 4, and 5, but additional information useful to engineers can be found in other parts of this survey, particularly in the section "Descriptions of the Soils" and "Formation and Classification of Soils."

Engineering classifications

Agricultural scientists of the United States Department of Agriculture classify soils according to texture. In some ways this system of naming textural classes is comparable to the systems most commonly used by engineers for classifying soils; that is, the system of the American Association of State Highway Officials (AASHO) and the Unified system.

Many highway engineers classify soil material according to the system approved by the American Association of State Highway Officials (AASHO) (*1*). In this system, classification is based on physical properties of the soil material and on the field performance of the soils in highways. Soil material is classified in several principal groups. The groups range from A–1, consisting of gravelly soils of high bearing capacity, to A–7, consisting of clay soils having low strength when wet. Within each group, the relative engineering value of the soil material is indicated by a group index number. Group index numbers range from 0 for the best material to 20 for the poorest. The estimated AASHO classification of the soils in the county, without the group index number, is given in table 3. The group number for the soil tested is given in table 5.

Some engineers prefer to use the Unified Soil Classification System (*16*). This system is based on the identification of soils according to their texture and plasticity and their performance as material in engineering structures. Soil material is identified as coarse grained, eight classes; fine grained, six classes; or highly organic. Table 3 shows the estimated Unified classification of the soils in the county.

Engineering properties

In table 3 the soil series of the county and the map symbols for mapping units are listed, and certain characteristics that are significant to engineering are described. Because bedrock is at a great depth, it is not significant to engineering and is not shown in the table. Salinity also is not shown because it is not a problem in the county.

A high water table is an important consideration in planning and designing engineering works. In this county Arkabutla, Bude, Henry, Mantachie, Ora, Paden, Providence, Rosebloom, and Wehadkee soils have a high water table. On these soils roads should be constructed on embankments or adequate surface and subsurface drainage should be provided.

The column headed "Depth from surface" indicates the depth and thickness of the layers for which estimates were made. The layers reported in table 3 are fewer and generally thicker than those in the detailed profiles described in the section "Descritpions of the Soils." Listed for the layers in table 3 are the AASHO and Unified engineering classifications, the USDA textural classification, and the estimated percentages of material that pass Nos. 4, 10, and 200 sieves. The amount of material passing a No. 200 sieve determines whether the soil material is coarse grained or fine grained.

Permeability is the rate of water percolation in the soil expressed in inches per hour. Permeability depends mainly on texture and structure, but it can also be affected by other physical properties. The permeability of each soil layer is important in planning drainage systems. Layers of soil that impede drainage or are very permeable can greatly affect the suitability of the soil material for foundations, sewage disposal fields, highways and highway subgrades, railroad embankments, fills, and irrigation systems.

In table 3 available water capacity is given in inches per inch of soil depth. The available water capacity is the approximate amount of capillary water in the soil when it is wet to field capacity, or the difference between the amount of water at field capacity and the amount at the permanent wilting point of plants. When the soil is air dry, this amount of water will wet the soil material to a depth of 1 inch without deeper penetration.

The column headed "Reaction" gives the degree of acidity or alkalinity in pH value. The pH value of a neutral soil is 7.0. The soil is acid if the pH value is less than 7.0, and it is alkaline if the pH value is more than 7.0.

TABLE 3.—*Estimated*

Soil series and map symbols	Depth to high water table	Depth from surface	Classification: USDA	Classification: Unified	Classification: AASHO
	Inches	*Inches*			
Arkabutla:					
Ar	[1] 10–20	0–36	Silt loam	ML–CL	A–4
		36–58	Silt loam	CL	A–7
Bude:					
Bu	[2] 8–12	0–22	Silt loam	ML	A–4
		22–42	Silty clay loam (fragipan)	CL	A–7
		42–55	Silty clay loam (fragipan)	CL or ML–CL	A–7
Cahaba:					
CrE (For properties of Ruston soils in this mapping unit, refer to Ruston series in this table.)	>72	0–10	Fine sandy loam, sandy loam	ML or SM	A–4
		10–36	Sandy clay loam	SC	A–6
		36–56	Sandy loam, loamy sand	SM, SC	A–2 to A–4
Gullied land:					
GrE. (Properties of Gullied land in mapping unit GrE are too variable to determine; for properties of Ruston soils in this unit, refer to Ruston series in this table.)					
Henry:					
He	[3] 0–10	0–20	Silt loam	ML–CL	A–4 or A–6
		20–33	Silty clay loam (fragipan)	CL	A–7
		33–55	Silt loam (fragipan)	ML–CL	A–4 or A–6
Leeper:					
Le	[1] 12–15	0–50	Silty clay	CL	A–7
Linker (Mapped only with Ruston and Shubuta soils.)	([4])	0–8	Sandy loam	SM or ML	A–4
		8–26	Sandy clay loam	SC or CL	A–6
		26	Sandstone.		
Mantachie:					
Mh	[1] 10–20	0–16	Fine sandy loam	ML or SM	A–4
		16–52	Loam	SM or ML	A–4
Oktibbeha (Mapped only with Sumter soils.)	>50	0–40	Clay	CH	A–7
		40–55	Marly clay	CH	A–7
Ora:					
OaB2, OaD3	[5] 25–30	0–5	Fine sandy loam	SM or ML	A–4
		5–18	Clay loam	SC	A–6
		18–38	Loam, sandy clay loam (fragipan).	SC	A–6 or A–7
		38–58	Sandy loam	SM	A–2 or A–4
OsD (For properties of Shubuta soils in this mapping unit, refer to Shubuta part under the Shubuta series in this table.)		0–8	Loam, silt loam	ML or CL	A–4
		8–18	Clay loam	CL	A–6
		18–38	Loam, sandy clay loam (fragipan).	SC	A–6 or A7
		38–58	Sandy loam	SM	A–2, A–4
Paden:					
PaA, PaB	[1] 20–30	0–22	Silt loam	ML	A–4
		22–31	Silty clay loam (fragipan)	CL	A–7
		31–65	Silt loam, loam (fragipan)	ML or CL	A–4
Providence:					
PdB3, PdC, PdC3	[5] 25–30	0–6	Silt loam	ML	A–4
		6–17	Silty clay loam	CL	A–7
		17–24	Silt loam	CL	A–6
		24–42	Loam (fragipan)	ML–CL	A–4
		42–55	Clay loam (fragipan)	CL	A–6 or A–7
PhB3, PhC3		0–7	Silt loam	ML	A–4
		7–26	Silty clay loam	CL	A–6 or A–7
		26–46	Loam (fragipan)	ML–CL	A–6 or A–4
		46–60	Silty clay	CL, CH	A–7

See footnotes at end of table.

engineering properties

Percentage passing sieve— No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.07 mm.)	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
			Inches per hour	*Inches per inch of soil*	*pH value*		
100	100	85-95	0. 63-2. 0	0. 18-0. 20	4. 5-5. 6	High	Low.
100	95-100	85-95	0. 63-2. 0	0. 18-0. 20	4. 5-5. 6	Moderate	Moderate.
100	100	85-95	0. 63-2. 0	0. 18-0. 20	4. 5-5. 6	High	Low.
100	100	85-95	0. 06-0. 20	0. 14-0. 16	4. 5-5. 6	High	Moderate.
100	100	85-95	0. 63-2. 0	0. 14-0. 16	4. 5-5. 6	Moderate	Moderate.
100	100	45-55	0. 63-2. 0	0. 12-0. 16	4. 5-5. 6	High	Low.
100	100	35-50	0. 63-2. 0	0. 14-0. 18	4. 5-5. 6	Moderate	Moderate.
100	100	30-40	2. 0-6. 3	0. 11-0. 15	4. 5-5. 6	High	Low.
100	95-100	85-95	0. 63-2. 0	0. 18-0. 20	4. 5-5. 6	High	Low.
100	95-100	85-95	0. 06-0. 20	0. 14-0. 16	4. 5-5. 0	Moderate	Moderate.
100	95-100	85-95	0. 06-0. 20	0. 14-0. 16	4. 5-5. 0	High	Low.
100	100	85-95	0. 06-0. 20	0. 18-0. 20	6. 6-8. 4	Moderate	High.
100	100	45-55	0. 63-2. 0	0. 11-0. 15	4. 5-5. 6	High	Low.
100	100	35-50	0. 63-2. 0	0. 14-0. 18	4. 5-5. 6	Moderate	Moderate.
100	95-100	40-60	0. 63-2. 0	0. 12-0. 15	4. 5-5. 6	High	Low.
100	90-100	45-65	0. 63-2. 0	0. 15-0. 18	4. 5-5. 6	High	Low.
100	100	90-95	0. 0 -0. 20	0. 16-0. 18	5. 0-6. 5	Low	Very high.
100	90-100	80-95	0. 0 -0. 20	0. 12-0. 16	5. 6-8. 4	Low	Very high.
100	90-100	40-60	0. 63-2. 0	0. 12-0. 15	4. 5-5. 6	High	Low.
100	95-100	35-50	0. 20-0. 63	0. 14-0. 18	4. 5-5. 6	Moderate	Low.
100	100	35-50	0. 06-0. 20	0. 10-0. 13	4. 5-5. 6	Moderate	Low.
100	100	30-40	0. 63-2. 0	0. 12-0. 15	4. 5-5. 6	Moderate	Low.
100	100	60-70	0. 63-2. 0	0. 15-0. 20	4. 5-5. 6	Moderate	Low.
100	95-100	35-50	0. 20-0. 63	0. 14-0. 18	4. 5-5. 6	Moderate	Low.
100	100	35-50	0. 06-0. 20	0. 10-0. 13	4. 5-5. 6	Moderate	Low.
100	100	30-40	0. 63-2. 0	0. 12-0. 15	4. 5-5. 6	Moderate	Low.
100	100	85-95	0. 63-2. 0	0. 18-0. 20	4. 5-5. 6	High	Low.
100	100	85-95	0. 06-0. 20	0. 14-0. 16	4. 5-5. 6	High to moderate	Low.
100	100	70-85	0. 06-0. 20	0. 14-0. 16	4. 5-5. 6	High to moderate	Low.
100	100	85-95	0. 63-2. 0	0. 18-0. 20	4. 5-5. 6	High	Low.
100	100	85-95	0. 63-2. 0	0. 18-0. 20	4. 5-5. 6	Moderate	Moderate.
100	100	85-95	0. 06-0. 20	0. 18-0. 20	4. 5-5. 6	High	Low.
100	100	70-90	0. 06-0. 20	0. 12-0. 15	4. 5-5. 6	High	Low.
100	100	60-80	0. 06-0. 20	0. 12-0. 14	4. 5-5. 6	High	Low.
100	100	85-95	0. 63-2. 0	0. 18-0. 20	4. 5-5. 6	High	Low.
100	100	85-95	0. 20-0. 63	0. 18-0. 20	4. 5-5. 6	Moderate	Moderate.
100	95-100	70-90	0. 06-0. 20	0. 10-0. 15	4. 5-5. 6	Moderate	Moderate.
100	100	85-95	0. 06-0. 20	0. 16-0. 18	4. 5-5. 6	Low	High.

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TABLE 3.—*Estimated*

Soil series and map symbols	Depth to high water table	Depth from surface	Classification: USDA	Classification: Unified	Classification: AASHO
	Inches	*Inches*			
Rosebloom:					
Rb, Rk (For properties of Arkabutla soil in Rk, refer to Arkabutla series.)	[1] 0–10	0–21	Silt loam	ML or ML–CL.	A–4
		21–32	Silt loam	CL	A–7
		32–63	Silt loam, silty clay loam	ML or ML–CL	A–4
Ruston:					
RsC, RtE, RuE (For properties of Linker soil in RtE and RuE, and for Shubuta soils in RuE, refer to Linker and Shubuta series, respectively, in this table.)	>72	0–11	Fine sandy loam, sandy loam	ML or SM	A–4
		11–58	Sandy clay loam	SC	A–6 to A–7
		58–66	Sandy loam, sandy clay loam	SM or SC	A–2 to A–4
Shubuta:					
SbB2, ScD3	>72	0–2	Clay loam	ML–CL	A–4
		2–23	Clay	CH or CL	A–7
		23–65	Clay, clay loam	CH	A–7
Part of Ora-Shubuta complex		0–7	Fine sandy loam	SM or ML	A–4
		7–30	Sandy clay	CL	A–7
		30–72	Sandy clay loam	SC or CL	A–6
Sumter:					
SgE, SoE2 (Properties of Gullied land in mapping unit SgE are too variable to determine; for properties of Oktibbeha soil in mapping unit SoE2, refer to Oktibbeha series in this table.)	[5] 25–35	0–26	Clay	CH	A–7
		26–50	Marl		
Tippah:					
TpC3 (For properties of Providence soils in this mapping unit, refer to PhB3 and PhC3 in the Providence series in this table.)	[1] 10–25	0–3	Silt loam	ML	A–4
		3–15	Silty clay loam	CL	A–7
		15–60	Silty clay	CH	A–7
Trinity:					
Tr	[5] 20–50	0–70	Silty clay	CH or MH	A–7
Wehadkee:					
Wm, Wn (For properties of Mantachie soils in these mapping units, refer to Mantachie series in this table.)	[6] 0–10	0–6	Fine sandy loam	SM or ML	A–4
		6–42	Sandy loam, loam	SM or ML	A–4
		42–55	Silty clay loam	CL	A–7

[1] Depth for 1 to 3 months each year.
[2] Depth for 1 to 3 months during winter and spring.
[3] Depth for 2 to 4 months each year.

engineering properties—Continued

Percentage passing sieve—			Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.07 mm.)					
			Inches per hour	*Inches per inch of soil*	*pH value*		
100	100	85–95	0. 63–2. 0	0. 18–0. 20	4. 5–5. 6	High	Low.
100	100	85–95	0. 63–2. 0	0. 18–0. 20	4. 5–5. 6	Moderate	Moderate.
100	100	85–95	0. 06–2. 0	0. 16–0. 18	4. 5–5. 6	High	Low.
100	100	45–55	0. 63–2. 0	0. 12–0. 15	4. 5–5. 6	High	Low.
100	100	35–50	0. 63–2. 0	0. 13–0. 16	4. 5–5. 6	Moderate	Moderate.
100	100	30–40	2. 0–6. 0	0. 12–0. 15	4. 5–5. 6	High	Low.
100	100	60–75	0. 63–2. 0	0. 13–0. 17	4. 0–5. 0	Moderate	Moderate.
100	100	85–95	0. 63–0. 20	0. 12–0. 16	4. 0–5. 0	Low	High.
100	100	85–95	0. 63–0. 20	0. 13–0. 17	4. 0–5. 0	Moderate	Moderate.
100	100	45–55	0. 63–2. 0	0. 11–0. 15	4. 0–5. 0	High	Low.
100	100	70–80	0. 63–2. 0	0. 15–0. 19	4. 0–5. 0	Moderate	Moderate.
100	100	45–80	0. 63–2. 0	0. 14–0. 18	4. 0–5. 0	Moderate	Moderate.
100	100	90–95	0. 06–0. 20	0. 15–0. 17	7. 4–8. 4	Low	Very high.
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100	100	85–95	0. 63–2. 0	0. 18–0. 20	4. 5–5. 6	High	Low.
100	100	85–95	0. 63–2. 0	0. 18–0. 20	4. 5–5. 6	Moderate	Moderate.
100	100	85–95	0. 06–0. 20	0. 16–0. 18	4. 5–5. 6	Low	High.
100	95–100	90–100	0. 06–0. 20	0. 18–0. 21	7. 4–7. 8	Low	High.
100	95–100	40–60	0. 63–2. 0	0. 11–0. 15	4. 5–5. 6	High	Low.
100	90–100	45–60	0. 63–2. 0	0. 12–0. 16	4. 5–5. 6	High	Low.
100	95–100	85–95	0. 20–0. 63	0. 14–0. 18	4. 5–5. 6	Moderate	Low.

[4] No water table above sandstone.
[5] Depth for 1 to 2 months each year.
[6] Depth for 2 to 6 months each year.

TABLE 4.—*Engineering*

Soil series and map symbols	Suitability as source of—				Soil features affecting—	
	Topsoil	Sand	Gravel	Road fill	Highway location	Dikes or levees
Arkabutla:						
Ar	Fair to good	Not suited	Not suited	Fair: Erodes readily.	Flood plain; occasional to frequent flooding.	Low stability; low to moderate shrink-swell potential.
Bude:						
Bu	Good except for a fragipan which extends at a depth between 22 and 55 inches or more.	Not suited	Not suited	Fair to good	Perched water table; drainage impeded by fragipan.	Permeability that ranges from moderate in upper part to slow in fragipan; moderate to high stability.
Cahaba:						
CrE (For interpretations of Ruston soils in this mapping unit, refer to Ruston series.)	Good	Underlying material is good for road subgrade in some areas.	Not suited	Good	Soil properties favorable; level to very steep.	Moderate permeability; high stability.
Gullied land:						
GrE (Interpretations of Gullied land in mapping unit GrE are too variable to determine; for interpretations of Ruston soils in this unit, refer to the Ruston series.)						
Henry:						
He	Poor	Not suited	Not suited	Fair: Erodes readily.	Low, level to depressional areas; high water table.	Low to moderate stability; low to moderate shrink-swell potential.
Leeper:						
Le	Poor	Not suited	Not suited	Poor: High shrink-swell potential.	Flood plain; very high shrink-swell potential.	Cracks when dry; slow permeability when moist.
Linker (Mapped only with Ruston and Shubuta soils.)	Fair to good	Not suited	Not suited	Fair: Depth to sandstone about 26 inches.	Depth to bedrock less than 3 feet.	Moderate permeability; moderate to high stability.
Mantachie:						
Mh	Fair to good	Poor	Poor	Fair to good	High water table; subject to flooding.	Moderate permeability; moderate strength and stability.
Oktibbeha (Mapped only with Sumter soils.)	Poor	Not suited	Not suited	Poor: Very high shrink-swell potential.	Nearly level to moderately sloping, plastic clay.	Very high shrink-swell potential.

interpretations

Soil features affecting—Continued							Limitations for septic tank filter fields
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways		
Reservoir area	Embankment						
Slow seepage rate; subject to flooding.	Low strength and stability; slow seepage rate.	Surface drainage needed.	Slow intake rate; high available water capacity.	Soil properties favorable.	High available water capacity; sod grows well.		Severe: Flooding; high water table.
Permeability that ranges from moderate in upper part to slow below fragipan.	Moderate to high strength and stability.	Surface drainage needed; substratum drainage difficult because of fragipan.	Moderate to slow infiltration rate; shallow to moderately deep root zone.	Soil properties favorable.	Low natural fertility; sod grows well if fertilizer is applied.		Severe: Perched water table; drainage impeded by fragipan.
Excessive seepage in some areas.	Moderate to high strength and stability.	Generally not needed.	Moderate intake rate; moderate permeability; moderate available water capacity.	Soil properties favorable on moderate slopes.	Low natural fertility; moderate available water capacity; sod grows well if fertilizer is applied.		Slight.
Slow seepage rate.	Low to moderate stability; low to moderate shrink-swell potential.	Surface drainage needed.	Slow intake rate; moderate available water capacity.	Not needed	Sod difficult to establish where pan occurs; moderate available water capacity.		Severe: High water table.
Impervious; will support deep water.	Cracks when dry; difficult to pack properly.	Surface drainage needed.	Soil cracks readily; high initial intake rate that decreases as soil becomes moist.	Not needed	Plastic clay; sod grows well.		Severe: Slow permeability; flooding.
Moderate seepage	Moderate to high strength and stability.	Drainage generally not needed.	Moderate intake rate and permeability.	Soil properties favorable.	Low available water capacity; sod grows well if fertilized.		Moderate: Moderate permeability.
Subject to stream overflow; moderate permeability.	Moderate to high strength and stability.	Surface drainage needed; high water table.	Moderate intake rate; moderate permeability.	Soil properties favorable.	High water table; moderate available water capacity.		Severe: High water table; subject to flooding.
Impervious; will support deep water.	Cracks when dry; subject to seepage; difficult to pack properly.	Surface drainage needed.	Soil cracks readily; high initial intake rate that decreases as soil becomes moist.	Soil properties favorable.	Plastic clay; sod grows well.		Severe: Very slow permeability.

TABLE 4.—*Engineering*

Soil series and map symbols	Suitability as source of—				Soil features affecting—	
	Topsoil	Sand	Gravel	Road fill	Highway location	Dikes or levees
Ora:						
OaB2, OaD3, OsD (For interpretations of Shubuta soils in mapping unit OsD, refer to Shubuta series in this table.)	Good except for fragipan extending from about 18 to 54 inches.	Generally poor: Underlying material is good for road subbase in some areas.	Not suited	Fair to good	Fragipan causes perched water table.	Permeability that ranges from moderate in upper part to slow in fragipan; high stability.
Paden:						
PaA, PaB	Fair to good except in fragipan.	Underlying material is good for road subgrade in some areas.	Not suited	Good	Fragipan impedes internal drainage; predominantly level to moderately sloping.	Moderate stability; low shrink-swell potential.
Providence:						
PdB3, PdC, PdC3	Fair to good except in fragipan.	Underlying material is good for road subgrade in some areas.	Not suited	Good	Fragipan impedes internal drainage; predominantly level to moderately sloping.	Moderate stability; low to moderate shrink-swell potential.
PhB3, PhC3	Upper part fair to poor; poor below a depth of 2 feet.	Not suited	Not suited	Poor: Underlain by plastic clay.	Nearly level to strongly sloping; underlain by plastic clay.	Moderate to low strength and stability.
Rosebloom:						
Rb, Rk (For interpretations of Arkabutla soils in the Rk mapping unit, refer to Arkabutla series in this table.)	Fair to good	Not suited	Not suited	Fair: Erodes readily.	Flood plain; occasional to frequent flooding.	Low stability; low to moderate shrink-swell potential.
Ruston:						
RsC, RtE, RuE (For interpretations of Linker soils in mapping units RtE and RuE and for interpretations of Shubuta soils in RuE, refer to Linker and Shubuta series, respectively, in this table.)	Good	Underlying material is good for road subbase in some areas.	Not suited	Good	Soil properties favorable; level to very steep.	Moderate permeability; moderate to high stability.
Shubuta:						
SbB2, ScD3	Surface layer good; rest is poor.	Not suited	Not suited	Poor	Moderate to high shrink-swell potential.	Slow permeability; moderate to high shrink-swell potential.

interpretations—Continued

Soil features affecting—Continued							Limitations for septic tank filter fields
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways		
Reservoir area	Embankment						
Excessive seepage below pan in some areas.	Moderate to high strength and stability.	Surface drainage needed in nearly level areas.	Moderate intake rate; moderate permeability in upper 1½ to 2 feet; moderate available water capacity.	Fragipan at a depth of 18 to 24 inches.	Moderate natural fertility; moderate available water capacity above and below fragipan.		Moderate to severe: Fragipan.
Excessive seepage below pan in some areas.	Moderate strength and stability.	Surface drainage needed in nearly level areas.	Slow intake rate; moderate available water capacity.	Soil properties favorable.	Moderate available water capacity above and below fragipan.		Moderate to severe: Fragipan.
Excessive seepage below pan in some areas.	Moderate strength and stability.	Surface drainage needed in nearly level areas.	Slow intake rate; moderate available water capacity.	Soil properties favorable.	Moderate available water capacity above and below fragipan.		Moderate to severe: Fragipan.
Slow seepage rate.	Low to moderate strength and stability; slow seepage rate.	Nearly level; surface drainage needed.	Slow intake rate; moderate permeability in upper 2 feet; slow permeability in fragipan.	Soil properties favorable.	Sod difficult to establish where pan occurs.		Moderate to severe: Fragipan.
Slow seepage rate; subject to flooding.	Low strength and stability; slow seepage rate.	Surface drainage needed.	Slow intake rate; high available water capacity.	Soil properties favorable.	High available water capacity; sod grows well.		Not suited: High water table; subject to flooding.
Excessive seepage in some areas.	Moderate to high strength and stability.	Generally not needed.	Moderate intake rate; moderate permeability; moderate available water capacity.	Soil properties favorable on moderate slopes.	Low natural fertility; moderate available water capacity; sod grows well if fertilizer is applied.		Slight.
Slow permeability; will support deep water.	Slow permeability; subject to cracking when dry.	Surface drainage needed in nearly level areas.	Moderate to slow intake rate; slow permeability.	Soil properties favorable on moderate slopes	Low natural fertility; moderate available water capacity.		Moderate to severe: Slow permeability in subsoil.

TABLE 4.—*Engineering*

Soil series and map symbols	Suitability as source of—				Soil features affecting—	
	Topsoil	Sand	Gravel	Road fill	Highway location	Dikes or levees
Sumter: SgE, SoE2 (Interpretations of Gullied land in mapping unit SgE are too variable to determine; for interpretations of Oktibbeha soil in mapping unit SoE2, refer to Oktibbeha series in this table.)	Poor	Not suited	Not suited	Poor: Shallow; high shrink-swell potential.	Plastic clay underlain by marl or chalk.	Plastic clay underlain by marl or clay.
Tippah: TpC3 (For interpretations of Providence soils in this mapping unit, refer to Providence series in this table.)	Upper part fair; poor below a . depth of 2 feet.	Not suited	Not suited	Poor: Underlain by clay.	Level to strong slopes; underlain by plastic clay; high water table.	Moderate to low strength and stability; high shrink-swell potential in lower part of subsoil.
Trinity: Tr	Poor	Not suited	Not suited	Poor: High shrink-swell potential.	Flood plain; occasional floods; high shrink-swell potential.	Cracks when dry; slow permeability when moist.
Wehadkee: Wm, Wn (For interpretations of Mantachie soil in these mapping units, refer to Mantachie series in this table.)	Fair to good	Poor	Poor	Fair to good	High water table; subject to flooding.	Moderate to slow permeability; moderate strength and stability.

The rating for dispersion in table 3 indicates the degree that a soil deflocculates and suspends in water. If the rating is high, the small particles slake readily.

The rating for shrink-swell potential indicates how much a soil changes in volume as its moisture content changes. This rating is based on tests for volume change that were made on similar soils in adjacent counties, or it is based on observations of other properties of the soils. In general, soils classified as CH and A–7 have high shrink-swell potential. Clean sand and gravel that contain small amounts of nonplastic to slightly plastic fines have low shrink-swell potential.

Engineering interpretations

Table 4 rates the soils according to their suitability as a source of topsoil, sand, gravel, and road fill. It also gives features that would affect use of the soils for highways, for agricultural engineering, and for septic tanks. These interpretations are based on experience with the same kinds of soils in other counties and on information in other parts of this soil survey.

A rating of *good*, *fair*, or *poor* is given to show suitability of soil material as a source of topsoil, sand, gravel, and road fill.

Topsoil is soil material, rich in organic matter, used to topdress roadbanks, lawns, gardens, and other places where vegetation needs to be established. Only the surface layer generally is used for topsoil, but other layers may be suitable. In the Bude and Ora soils, the surface layer is a good source of topsoil but the substratum is not suitable because of a fragipan.

The ratings for sand and gravel in table 4 are based on the probability that the soil contains deposits of these materials. They do not indicate the quality of the deposits or their size. Most soils in the county have too many fines to be a suitable source of sand and gravel. In some areas the substratum of Ora, Paden, Providence, and Ruston soils contains sand suitable for use as subgrade for roads.

Road fill is material used to build embankments. The ratings in table 4 indicate the performance of soil material that has been moved from borrow areas for this purpose.

The selection of highway locations is affected by susceptibility to flooding, a high water table, capacity of the soil to support traffic, shrink-swell potential, and other factors that affect construction. Poor drainage and flooding cause serious problems in the design, construction, and maintenance of highways. The Leeper, Oktibbeha, Shubuta, and Trinity soils, for example, shrink when dry and swell *interpretations*—Continued

Soil features affecting—Continued							Limitations for septic tank filter fields
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways		
Reservoir area	Embankment						
Plastic clay underlain by marl or clay.	Difficult to pack; subject to excessive seepage.	Surface drainage needed.	Cracks easily; high initial intake rate, decreasing as soil becomes moist.	Marl at a depth of about 24 inches.	Marl at a depth of about 24 inches; sod grows well in upper part.		Severe: Very slow permeability.
Slow seepage rate	Low to moderate strength and stability; slow seepage rate.	Surface drainage needed.	Slow intake rate; moderate to slow permeability.	Soil properties favorable.	Moderate to high available water capacity; sod grows fairly well.		Severe: Heavy plastic clay.
Impervious; will support deep water.	Cracks when dry; difficult to pack properly; subject to excessive seepage.	Surface drainage needed.	Soil cracks readily; high initial intake rate that decreases as soil becomes moist.	Not needed	Plastic clay; sod grows fairly well.		Severe: Flooding; very slow permeability.
Subject to stream overflow; moderate to slow permeability.	Moderate to high strength and stability.	Surface drainage needed; high water table.	Moderate intake rate; moderate to slow permeability; moderate available water capacity.	Not needed; soil properties favorable.	High water table; moderate available water capacity.		Severe: High water table; subject to flooding.

when wet. These soils generally are not suitable for road embankments or for the upper part of earthen dams. They expand and contract, and when used as subgrade material, cause the pavement to crack and warp. The cracking and warping can be reduced if a thick layer of soil that has low volume change is used for a foundation course. Such a layer provides internal drainage and should extend through the shoulders of the road. Where shoulders are wide and less steep than normal, excessive volume changes in the underlying material tend to lessen. Where flooding is a hazard, roads should be built on a continuous embankment that is several feet above the level of flooding.

A fragipan is a compacted layer that is loamy and brittle and is rich in silt or very fine sand. It is seemingly cemented, and it restricts movement of water through the soil. Thus it presents a problem in designing a highway. The Bude, Henry, Ora, Paden, and Providence soils have a fragipan at a depth between 18 and 26 inches. In nearly level areas of these soils, ditches along the roads should extend below the fragipan. The pavement should be at least 4 feet above the fragipan. In places it is necessary to remove the fragipan and replace it with more permeable material.

Dikes and levees are low structures that are designed to impound or divert water. The soil features listed in table 4 are those that affect use of the soil for building these structures.

Farm ponds are used to supply water for livestock and other farm needs, as habitats for fish and wildlife, and as recreational areas. A multipurpose pond is built by constructing an embankment across a watercourse or natural basin. The reservoir area is affected mainly by loss of water through seepage. Soils that are more impervious are better suited to this use therefore than other kinds of soils. Seepage is excessive in Cahaba-Ruston association, hilly, and in the Ora, Paden, and Providence soils. Ponds built in these soils may fail. Characteristics of the subsoil and substratum should be considered when constructing pond embankments. Such soils as the Arkabutla and Rosebloom should not be used in embankments because their stability is low. Material used in foundations must have sufficient bearing strength to support embankments after minimum compaction. It also must be impervious enough to prevent excessive seepage.

Some of the drainage problems in soils of the county are listed in table 4. A complete drainage system is needed for more effective use of most soils on bottom lands in the county. Many improvements in drainage have been made in cultivated areas, but still more are needed.

TABLE 5.—*Soil test data*

[Tests performed by Mississippi State Highway Department in cooperation with the U.S. Department of Commerce, Bureau of Public Roads, in accordance with standard procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Soil name and location	Depth	Moisture density: Maximum dry density	Moisture density: Optimum moisture	Mechanical analysis[1] Percentage passing sieve— No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	Percentage smaller than— 0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.	Liquid limit	Plasticity index	Classification: AASHO[2]	Unified[3]
	Inches	*Lb. per cu. ft.*	*Percent*												
Shubuta clay loam: NW¼SW¼sec. 18, T. 1 S., R. 7 E.	2–14	87	27	100	99	99	89	81	72	60	56	68	27	A–7–5(19)	MH
	38–58	92	26	100	100	100	91	81	64	49	43	73	47	A–7–6(20)	CH

[1] According to the AASHO Designation: T 88–57 (*1*). Results by this procedure frequently may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of the material, including 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 analyses data used in this table are not suitable for use in naming textural classes for soil.

[2] Based on AASHO Designation: M 154–49 (*1*).

[3] Based on Unified Soil Classification System, Technical Memorandum No. 3–357, v. 1, Corps of Engineers (*16*).

General suitability of the soils for irrigation is shown in table 4. The average annual rainfall is about 54 inches, but supplemental irrigation would be beneficial in most years. Rainfall often does not occur frequently enough in June, July, and August for optimum growth of plants.

A terrace is an earthen embankment, or a ridge and channel, constructed across the slope. It collects runoff and transports it safely to a protected outlet. Conventional terraces that follow the contour of the land have been widely used in the county. Such terraces generally are crooked and are difficult to farm with present farm machinery. By land smoothing, cutting and filling along terrace lines, varying the grade, and using multiple outlets, a system of parallel terraces can be constructed on much of the sloping land now used for cultivated crops. If this kind of terrace system is used, fewer odd-shaped areas result and more of the acreage can be cropped.

A diversion is a graded or excavated channel that has a supporting ridge on the lower side and is constructed across a slope at a controlled grade. It diverts excess water to areas that need water or to where it can be disposed of safely.

Grassed waterways carry excess water away from terraces, diversions, and other areas. Shallow soil depth adversely affects the construction of waterways. It makes the soil droughty and impedes growth of vegetation. Examples of such soils are the Bude, Ora, Paden, and Providence, which are shallow to a fragipan. Frequent flooding also is a hazard in establishing a waterway. Floodwater slows the growth of plants or kills them.

Limitations of the soils for use as filter fields for septic tanks and soil features that affect their use for this purpose are shown in table 4. The main limiting factors are slow permeability, flooding, and a high water table. The ratings used are *slight*, *moderate*, or *severe*. If the rating is moderate or severe, the main limitation (or limitations) is also given.

Soil test data

A sample of Shubuta clay loam was tested according to the procedures of the American Association of State Highway Officials (AASHO). The results of the tests and the classification of the sample according to both AASHO and Unified systems are given in table 5.

The engineering soil classifications in table 5 are based on data obtained by mechanical analysis and by tests to determine liquid and plastic limits. The mechanical analyses were made by the combined sieve and hydrometer methods. The percentage of clay obtained by the hydrometer method should not be used in naming the textural class of the soil.

Moisture density, the relation of moisture content and the density to which a soil material is compacted, is also given in table 5. If a soil material is compacted at 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. The highest dry density obtained in the compaction tests is termed maximum dry density. Moisture-density data are important in earthwork, for as a rule optimum stability is obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

The *plasticity index* indicates the range of moisture content within which a soil material is plastic. It is the numerical difference between the liquid limit and the plastic limit (*6*). The test for plastic limit measures the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As 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 material passes from a semisolid to a plastic state. The *liquid limit* is the moisture content at which the material passes from a plastic to a liquid state.

Use of the Soils for Recreation

Recreation is becoming increasingly more important in Alcorn County. Among the present recreational facilities are a large lake for fishing and boating, a golf course, and some intensive play areas. More recreational areas are needed because of the increasing population in the county and in the surrounding areas.

In table 6 the limitations and hazards that affect the suitability of the soils for use as campsites, picnic areas, fairways for golf courses, intensive play areas, and trafficways are given. The ratings are *slight*, *moderate*, *severe*, and *very severe*. A rating of *slight* means that the soil has few or no limitations for the specified use or that its limitation can be easily overcome. A rating of *moderate* means that some planning and engineering work are needed to overcome the limitation. A rating of *severe* means that the soil is poorly suited to the specified use and that intensive engineering work is needed before the limitation can be overcome. A rating of *very severe* means that the soil is very poorly suited to the specified use and that overcoming the limitation is not economically feasible.

The principal recreational uses of the soils in the county are discussed in the following paragraphs.

Campsites.—A campsite should be suitable for tents and the accompanying activities of outdoor living for a period of at least one week. Major factors used to rate soils in table 6 for their suitability as campsites are slope, trafficability, and inherent erodibility. Little preparation of the soils at the site is necessary. Wetness is a serious limitation. Soils should be able to produce a good growth of trees and grass, and they should have an attractive landscape.

Picnic areas.—These areas are used for pleasure outings that include a meal out of doors. Picnic tables and fireplaces generally need to be built, but other than this little preparation is needed. The major requirements are an attractive landscape and good trafficability. Slope and inherent erodibility of the soil are also important.

Golf fairways.—The soils are rated in table 6 only for golf course fairways. They are not rated for the rough or for other hazards because many kinds of soils are suited to these uses. Also, the soils are not rated for greens, which generally are man-made. The suitability of a soil for fairways depends mainly on its ability to withstand traffic on foot and from golf carts, especially soon after a rain. Other factors considered in the ratings are the amount of coarse fragments, the productivity, and the slope.

Intensive play areas.—These are areas developed for playgrounds and for organized games such as baseball, tennis, and badminton. Since these areas are subject to heavy foot traffic, they generally require a soil that is nearly level, has good drainage, and has a texture and consistency that provide a firm surface. The soil should not have coarse fragments and rock outcrops. Less than 2 acres generally is needed for an intensive play area. Important properties of soils intended for this use are slope, depth to fragipan or claypan, and trafficability.

Trafficways.—Trafficways are areas that can be developed as roads and trails at a low cost. Their construction involves cuts and fills of limited size as well as limited preparation of the subgrade. The major considerations in rating the soil for this use are slope; depth of the fragipan, claypan, or water table; hazard of flooding, erodibility; and capacity to support traffic.

Natural parks.—The soils of Alcorn County have not been rated in table 6 for use as natural parks. A wide range of the soils are suitable for this use. Nature trails, hiking trails, bridle paths, picnic areas, campsites, and intensive play areas can be developed on large areas reserved for parks.

Formation and Classification of Soils

In this section the five major factors of soil formation are discussed in terms of their effect on formation of the soils in Alcorn County. Then representative soil horizons are discussed, the current system of soil classification is described, and the soils are placed in classes of that system.

Factors of Soil Formation

Soil is produced by the interaction of five major factors of soil formation. These factors are parent material, climate, plants and animals, relief, and time. The kind of soil formed in one area differs from the kind formed in another area if there has been a difference between the two areas in climate, vegetation, or any other factor.

Parent material.—Parent material, the unconsolidated mass from which soils form, is important in determining the kinds of soils that form. The parent material of the soils in Alcorn County is alluvium, loam, or marine deposits.

Alcorn County is on the Coastal Plain. Water from the Gulf of Mexico covered the entire county some 60 millions of years ago. As the seas receded sediment made up of sand, silt, and clay was laid down on the land. Most of the alluvium was deposited by rivers or small streams during floods. The deposits of loess consist of silt first deposited on the flood plains and then redeposited by wind on older formations of the Coastal Plain. They are seldom more than 4 feet thick and are almost entirely lacking where the slope is more than 12 percent.

Throughout the county the loess generally is mixed with sandy material of the Coastal Plain. As a result, many of the soils formed partly in loess and partly in the underlying sandy material. Examples are soils of the Bude, Henry, Paden, Providence, and Tippah series. In the eastern part of the county the deposit of loess is thin or is lacking. Here the soils are sandier because they formed chiefly in sandy material.

Trinity soils are examples of soils formed in alluvium. These soils formed in material washed from upland soils.

Climate.—Alcorn County has the humid, temperate climate characteristic of the southeastern part of the United States. The climate is described in the section "General Nature of the County."

TABLE 6.—*Limitations of soils*

[The ratings of the limitations

Map symbol	Soil	Limitations for— Campsites
Ar	Arkabutla silt loam	Severe: Flooding
Bu	Bude silt loam	Moderate: Wetness
CrE	Cahaba-Ruston association, hilly [1]	Severe: Slope
GrE	Gullied land-Ruston complex, 8 to 40 percent slopes.[2]	
He	Henry silt loam	Severe: Wetness
Le	Leeper silty clay	Severe: Flooding
Mh	Mantachie fine sandy loam	Severe: Flooding
OaB2	Ora fine sandy loam, 2 to 5 percent slopes, eroded	Slight
OaD3	Ora fine sandy loam, 5 to 12 percent slopes, severely eroded	Moderate: Slope
OsD	Ora-Shubuta complex, 8 to 12 percent slopes.[2]	
PaA	Paden silt loam, 0 to 2 percent slopes	Moderate: Wetness
PaB	Paden silt loam, 2 to 5 percent slopes	Moderate: Wetness
PdB3	Providence silt loam, 2 to 5 percent slopes, severely eroded	Moderate: Fair trafficability
PdC	Providence silt loam, 5 to 8 percent slopes	Moderate: Fair trafficability
PdC3	Providence silt loam, 5 to 8 percent slopes, severely eroded	Moderate: Fair trafficability
PhB3	Providence silt loam, heavy substratum, 2 to 5 percent slopes, severely eroded	Moderate: Fair trafficability
PhC3	Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	Moderate: Fair trafficability
Rb	Rosebloom silt loam	Severe: Flooding
Rk	Rosebloom-Arkabutla association, frequently flooded [1]	Severe: Flooding
RsC	Ruston fine sandy loam, 5 to 8 percent slopes	Slight
RtE	Ruston-Linker association, hilly [1]	Severe: Slope
RuE	Ruston-Shubuta-Linker association, hilly.[2]	
SbB2	Shubuta loam, 2 to 5 percent slopes, eroded	Slight
ScD3	Shubuta clay loam, 8 to 12 percent slopes, severely eroded	Moderate: Slope; gullies; high clay content in surface layer.
SgE	Sumter-Gullied land complex, 8 to 25 percent slopes.[2]	
SoE2	Sumter-Oktibbeha complex, 12 to 17 percent slopes, eroded [1]	Severe: Slope; high clay content in surface layer.
TpC3	Tippah-Providence complex, 2 to 8 percent slopes, severely eroded [1]	Moderate: Fair trafficability
Tr	Trinity silty clay	Severe: Flooding
Wm	Wehadkee-Mantachie association, frequently flooded [1]	Severe: Flooding
Wn	Wehadkee-Mantachie complex,	Severe: Flooding

[1] The individual soils of this unit have about the same limitations and therefore are rated as one unit.

Little or no variation in climate occurs within the county. As a result, the effect of climate on soil development has been uniform. Even though climate has strongly affected the formation of many of the soils, differences among soils within the county cannot be attributed to differences in climate.

Many soils that developed in a humid, temperate climate have distinct characteristics. This is true in Alcorn County, where many of the soils are strongly weathered, highly leached, acid, and low in natural fertility. The high rainfall causes fairly intense leaching and also causes soluble and colloidal material to move downward through the soil. The soil is frozen only for short periods in winter, and translocation and leaching proceed without interruption throughout most of the year.

Plants and animals.—Plants have been the principal organism influencing the formation of soils in this county, but animals, earthworms, insects, bacteria, and other organisms that live on and in the soil have also been important. Two of the chief functions of plant and animal life are to furnish organic matter and to bring plant nutrients from the lower part of the solum to the upper layers.

Early settlers found dense stands of mixed hardwoods and an understory of vines and native shrubs on the lower hillsides. The upper ridges were covered with hardwood and pine trees. On the stream bottoms the native vegetation ranged from thick stands of large deciduous trees that had a heavy undergrowth of vines and cane to fresh-water swamp plants.

A number of organisms live in the soils of the county. Most of these are plants, such as algae, fungi, bacteria, *for developed recreational uses*

are explained in the text]

Limitations for—Continued			
Picnic areas	Golf fairways	Intensive play areas	Trafficways
Moderate: Flooding	Severe: Flooding	Severe: Flooding	Moderate: Wetness.
Moderate: Wetness	Moderate: Wetness	Moderate: Wetness	Moderate: Wetness.
Severe: Slope	Severe: Slope	Severe: Slope	Severe: Slope.
Severe: Wetness	Severe: Wetness	Severe: Wetness	Severe: Wetness.
Severe: Flooding	Severe: Flooding	Severe: Flooding	Severe: Flooding.
Severe: Flooding	Severe: Flooding	Severe: Flooding	Severe: Flooding.
Slight	Slight	Moderate: Slope	Slight to moderate: Good to fair traffic supporting capacity.
Moderate: Slope	Moderate: Slope	Severe: Slope	Slight to moderate: Good to fair traffic supporting capacity.
Moderate: Wetness	Moderate: Wetness	Moderate: Wetness	Moderate: Wetness.
Moderate: Wetness	Moderate: Wetness	Moderate: Slope	Moderate: Wetness.
Moderate: Fair trafficability	Moderate: Fair trafficability	Moderate: Fair trafficability; slope.	Moderate: Fair traffic supporting capacity.
Moderate: Fair trafficability	Moderate: Fair trafficability	Moderate to severe: Fair trafficability; slope.	Moderate: Fair traffic supporting capacity.
Moderate: Fair trafficability	Moderate: Fair trafficability	Moderate to severe: Fair trafficability; slope.	Moderate: Fair trafficability.
Moderate: Fair trafficability	Moderate: Fair trafficability	Moderate: Fair trafficability	Moderate: Fair trafficability.
Moderate: Fair trafficability	Moderate: Fair trafficability	Moderate to severe: Fair trafficability; slope.	Moderate: Fair trafficability.
Severe: Flooding	Severe: Flooding	Severe: Flooding	Severe: Flooding.
Severe: Flooding	Severe: Flooding	Severe: Flooding	Severe: Flooding.
Slight	Slight	Moderate: Slope	Slight.
Moderate to severe: Slope	Severe: Slope	Severe: Slope	Moderate: Slope.
Slight	Slight	Moderate: Slope	Severe: Poor traffic supporting capacity.
Moderate: Slope; gullies; clay loam in surface layer.	Moderate: Slope; gullies; high clay content in surface layer.	Severe: Slope	Severe: Poor traffic supporting capacity.
Severe: Slope; high clay content in surface layer.	Severe: Slope; high clay content in surface layer.	Severe: Slope; high clay content in surface layer.	Severe: Poor traffic supporting capacity.
Moderate: Fair trafficability	Moderate: Fair trafficability	Moderate: Slope; fair trafficability.	Moderate: Fair trafficability.
Severe: Flooding	Severe: Flooding	Severe: Flooding	Severe: Flooding.
Severe: Flooding	Severe: Flooding	Severe: Flooding	Severe: Flooding.
Severe: Flooding	Severe: Flooding	Severe: Flooding	Severe: Flooding.

[2] Properties too variable for a rating to be made.

and the roots of higher plants. Some of the organisms are animals, such as earthworms, crayfish, mites, and nematodes. The existence of these organisms depends mainly on soil conditions, and particularly on the food supply.

Burrowing and mixing of the soil by earthworms and crayfish occur chiefly within the uppermost few inches of the soil. The uprooting of trees by wind also causes considerable soil mixing.

Man also has brought about many changes in the soils by changing the kind of vegetation growing on them. Through repeated clearing of the woodlands, cultivating of the soils, introducing of new plant species, building of structures to control water, and improving of natural drainage, man continues to influence the kind of soils that form in the county and their rate of development.

Relief.—Relief influences soil formation through its effect on drainage, erosion, plant cover, and soil temperature. The relief in Alcorn County ranges from nearly level on the bottom lands to steep in the uplands. The maximum difference in elevation between valleys and crests of adjacent hills is about 300 feet.

The steep slopes in the uplands cause rapid runoff from many soils. Water runs rapidly off these steep slopes and removes much of the soil material before definite horizons have time to form. Loess deposited on the steep slopes was removed by geologic erosion almost as fast as it was deposited.

In nearly level areas, a fragipan or a compacted layer of silt and finer textured material is likely to form in many of the soils. As slope of the soil increases, thickness of the fragipan generally decreases.

Time.—A long period of time generally is required for a soil to form. Differences in the length of time of soil formation are responsible for most differences among soils that cannot be attributed to other factors of soil formation.

The soils on first bottoms along streams and on alluvial areas are the youngest. They lack well-defined horizons. Most of the soils that formed on the smoother parts of the uplands and on old stream terraces have a well-defined profile. These soils are considered old or mature. They formed on materials that are less resistant to weathering than those of young soils or that have been in place long enough for distinct horizons to develop.

Representative Soil Horizons

The action of the soil-forming factors is reflected in the soil profile, which is a succession of horizons, or layers, that extends from the surface down to the unaltered parent material. The horizons differ in one or more properties, such as color, texture, thickness, structure, consistence, porosity, and reaction.

The main layers used in classifying the soils of Alcorn County are mollic epipedons, ochric epipedons, cambric horizons, and argillic horizons.

A mollic epipedon is a thick, dark-colored layer at the surface that is much like the surface layer of soils that formed under grass. This layer may have moderate to strong structure, a base saturation of 50 percent or more, and calcium as the dominant metallic cation. Trinity silty clay is the only soil in the county that has a mollic epipedon. This soil is characteristically thick, dark, and friable.

An ochric epipedon is a layer at the surface that contains some organic matter but is too light colored or too thin to meet the requirements of other kinds of epipedons. All of the soils in the county except Trinity silty clay have an ochric epipedon.

A cambric horizon is a subsoil horizon that has been altered but that shows no evidence of accumulated iron or aluminum. In places this horizon is at the surface in soils that are eroded or in soils that have been leveled. Arkabutla, Mantachie, and Sumter soils have cambric horizons.

An argillic horizon is one in which silicate clay has accumulated. Providence, Ora, and Tippah soils have argillic horizons. The argillic horizons generally are in the subsoil but are at the surface in places in soils that are eroded or in soils that have been leveled.

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.

Thus in classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and used in managing farms, fields, and woodland; 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.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and later revised (*11*). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965. The current system is under continual study (*7*, *14*). Therefore, readers interested in developments of the current system should search the latest literature available. In table 7 the soil series of Alcorn County are placed in some categories of the current system.

The current system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. In

TABLE 7.—*Soil series classified according to the current system of classification*

Series	Family	Subgroup	Order
Arkabutla	Fine-silty, mixed, acid, thermic	Aeric Fluventic Haplaquepts	Inceptisols.
Bude	Fine-silty, mixed, thermic	Glossaquic Fragiudalfs	Alfisols.
Cahaba	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Henry [1]	Coarse-silty, mixed, thermic	Typic Fragiaqualfs	Alfisols.
Leeper	Fine montmorillonitic, nonacid, thermic	Chromudertic Haplaquepts	Inceptisols.
Linker	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Mantachie	Fine-loamy, siliceous, acid, thermic	Aeric Fluventic Haplaquepts	Inceptisols.
Oktibbeha	Very fine, montmorillonitic, thermic	Vertic Hapludalfs	Alfisols.
Ora	Fine-loamy, mixed, thermic	Typic Fragiudults	Ultisols.
Paden	Fine-silty, mixed, thermic	Ochreptic Fragiudalfs	Alfisols.
Providence	Fine-silty, mixed, thermic	Typic Fragiudalfs	Alfisols.
Rosebloom	Fine-silty, mixed, acid, thermic	Fluventic Haplaquepts	Inceptisols.
Ruston	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Shubuta	Clayey, mixed, thermic	Typic Paleudults	Ultisols.
Sumter	Fine-carbonatic, thermic	Rendollic Eutrochrepts	Inceptisols.
Tippah	Fine-silty, mixed, thermic	Aquic Paleudalfs	Alfisols.
Trinity	Fine, montmorillonitic (calcareous), thermic	Vertic Haplaquolls	Mollisols.
Wehadkee [2]	Fine-loamy, mixed, nonacid, thermic	Fluventic Haplaquepts	Inceptisols.

[1] These soils are taxadjunct to the Henry series. Base saturation is less than 35 percent at a depth of 30 inches, and the soil is otherwise similar to Henry series.

[2] Because of recent modifications in classification, these soils are now considered too acid for the named series.

this system the criteria used as a basis for classification are soil properties that are observable and measurable. These properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped together. Most of the classes of the current system are briefly defined in the following paragraphs.

ORDERS.—Ten soil orders are recognized. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate these soil orders are those that tend to give broad climatic groupings of soils. Two exceptions, the Entisols and Histosols, occur in many different kinds of climate. The four orders in Alcorn County are Alfisols, Inceptisols, Mollisols, and Ultisols.

Alfisols formed mostly under trees, but some formed under grass. They are light colored and have a base saturation of more than 35 percent. The base saturation increases with increasing depth.

Inceptisols are mineral soils in which horizons have definitely started to develop. They generally are on young, but not recent, land surfaces.

Mollisols have formed mostly under grass. They have a thick, friable, dark-colored surface layer. Base saturation is more than 50 percent.

Ultisols have a clay-enriched B horizon that has less than 35 percent base saturation. Base saturation decreases with increasing depth.

SUBORDERS.—Each order is subdivided into suborders, primarily on the basis of those characteristics that seem to produce classes having the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging, or soil differences resulting from climate or vegetation.

GREAT GROUPS.—Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and other features. The horizons used to make separations are those in which clay, iron, or humus have accumulated or those that have pans that interfere with growth of roots or movement of water. The features used are the self-mulching properties of clay, temperature of the soil, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), or the dark-red or dark-brown colors associated with soils formed in material weathered from basic rocks.

SUBGROUPS.—Great soil groups are subdivided into subgroups. One of these represents the central, or typic, segment of the group. Other subgroups, called intergrades, have properties of the group but have one or more properties of another great group, suborder, or order. Also, subgroups may be established from those soils having properties that intergrade outside 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 Fragiudalfs*.

FAMILIES.—Families are separated within a subgroup primarily on the basis of properties important to the growth of plants or behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of the horizons, and consistence. The names of families consist of a series of adjectives that precede the name of a subgroup. The adjectives used are the class names for soil texture, mineralogy, and so on. An example is the *fine-silty*, *mixed*, *thermic* family of *Ochreptic Fragiudalfs*.

General Nature of the County

This section is primarily for those not familiar with the county. It describes the physiography, relief, and drainage, the geology, water supply, and climate. This information combined with that about the county in the front of this survey provides an overall environmental picture.

Physiography, Relief, and Drainage

Alcorn County is entirely within the physiographic province known as the Coastal Plain. The county is made up of rolling hills and nearby level bottoms. Elevation ranges from 425 feet to 723.6 feet above sea level, and slopes range from nearly level to steep. The eastern part of the county is predominantly rolling and hilly. Along streambanks close to the Tuscumbia Channel in the central part, the terrain is nearly level to gently sloping. The western part of the county is rolling and hilly and includes the area known as Hatchie Hills.

Most drainage in the county is toward the northwest and is by the Tuscumbia River and its tributaries. The western part of the county is drained by the Hatchie River, which enters the county in the southwest corner and flows northward into Tennessee. Streams that drain the eastern part of the county are the Yellow, Chambers, and Sevenmile Creeks. All of these empty into the Tennessee River.

The larger streams that empty into the Tuscumbia River generally have been dredged for short distances along their lower course. Dredging was done about 50 years ago, however, and most of the streams now are partly refilled with silt and sand washed in from upstream or with backwater of the river. Drainage through the Tuscumbia River is sluggish. After a heavy rain most of the first bottom along the river is under water, and it takes 2 to 4 days for the water to recede.

Geology

Four geologic formations are represented in the county (fig. 7). These are, from east to west, Coffee sand, Demopolis chalk, and the Coon Creek tongue and the McNairy sand members of the Ripley formation. Coffee sand underlies the eastern third of the county. The area extends from the county line westward to near Corinth (*9*). Demopolis chalk, a member of the Selma chalk formation, occupies an area about 5 miles wide through the center of the county. To the west is the Coon Creek tongue, which crops out at the foot of the Hatchie Hills. The McNairy sand member of the Ripley formation underlies the rest of the western part of the county.

The Coffee sand formation consists of irregularly bedded glauconitic sand and interbedded clay. Soils on Coffee sand are sandy and generally are of Coastal Plain origin. Demopolis chalk consists of plastic, nearly white sandy

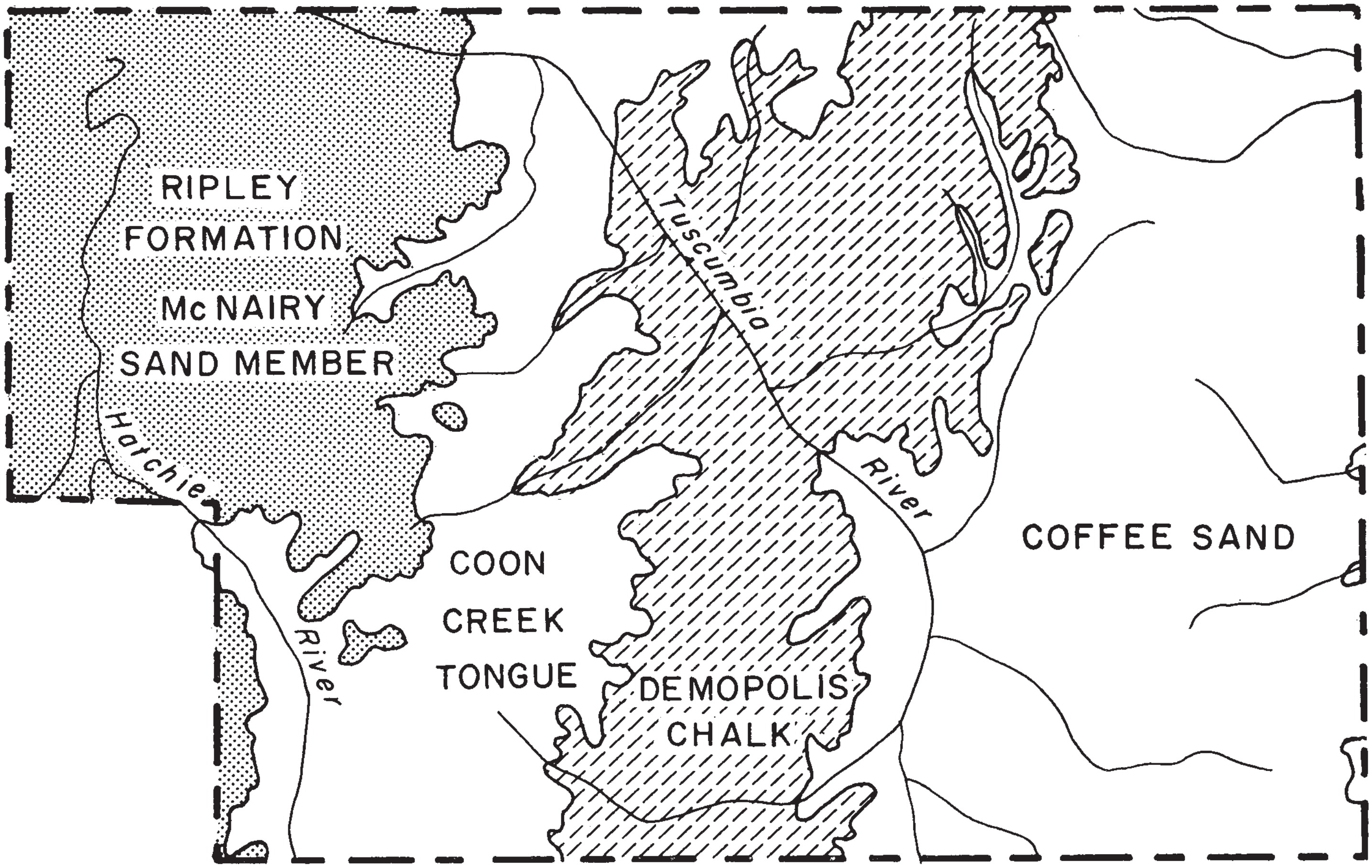

***Figure 7.*—Generalized geologic map of Alcorn County.**

clay. It is micaceous and calcareous, and it contains some green sand. Most soils on Demopolis chalk consist partly of loess for a thin capping of loess overlies the chalk. The two members of the Ripley formation make up the underlying material in the western part of the county. They consist of fine, calcareous, glauconitic sand, sandstone, sandy limestone, and subordinate beds of clay. The soils in these areas are a mixture of Coastal Plain material and of sand and clay.

Water Supply

The water supply in Alcorn County generally is adequate for farm use. In the eastern part of the county, springs and wells provide water for most farm homes. Here water for livestock is obtained chiefly from permanent and intermittent streams, though farm ponds provide some of the water for livestock. In the western part of the county, dug wells, springs, and deep drilled wells are the source of water. Drilled wells provide running water for many farm homes. In places cisterns and storage tanks supplement the main water supply.

Drilled wells provide water for domestic use for the city of Corinth. Such wells also are the source of water for industrial use throughout the county. The Pickwick Reservoir, about 20 miles northeast of Corinth, provides recreation for many in the county.

Climate [4]

The climate of Alcorn County is determined mainly by the subtropical latitude, the great land mass to the north and west, the warm waters of the Gulf of Mexico, and the prevailing winds. The county is in the path of several principal storm tracks. It is affected mainly, however, by storm centers that move along the Gulf Coast and then up the Atlantic Coast and by storms that move northeastward from Oklahoma to the Great Lakes and then on to the coast of Maine. Data on temperature and precipitation are given in table 8.

Temperatures vary slightly from year to year. In general summers are hot and humid, and winters are mild. Occasionally westerly or northerly winds flow over the county in summer and bring hot, dry weather. Temperatures of 100° F. or more have been recorded in the period May to September. The highest temperature ever recorded at Corinth since 1891 is 111° on July 29, 1930. In half the years, however, the warmest temperature was no more than 102°. On the average about 7 out of 9 days in July and August have a maximum temperature of 90° or higher.

Moist tropical air and dry polar air alternate in the county in winter. Cold spells seldom last more than 3 or

[4] By E. J. SALTSMAN, State climatologist for Mississippi, Weather Bureau, ESSA, U.S. Department of Commerce.

TABLE 8.—*Temperature and precipitation data*

[Data from records kept at Corinth for the period 1931–60, inclusive]

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	2 years in 10 will have at least 4 days with—		Average monthly total	1 year in 10 will have—		Average number of days with snow cover 1.0 inch or more	Average depth of snow on days with snow cover
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—		
	° F.	° F.	° F.	° F.	*Inches*	*Inches*	*Inches*	*Number*	*Inches*
January	53	33	71	15	6. 2	2. 3	12. 9	1	3. 0
February	56	35	71	18	5. 4	1. 9	9. 8	1	3. 0
March	64	41	78	26	5. 4	2. 1	8. 0	(1)	0
April	74	51	87	36	4. 7	2. 7	7. 0	0	0
May	83	59	94	46	4. 0	1. 3	6. 1	0	0
June	91	68	100	56	3. 8	1. 0	6. 9	0	0
July	93	70	100	63	4. 0	1. 9	6. 6	0	0
August	93	69	102	61	3. 4	. 6	5. 9	0	0
September	87	63	97	49	3. 2	. 4	7. 3	0	0
October	77	51	90	38	2. 8	. 4	6. 2	0	0
November	63	40	78	25	4. 6	1. 4	10. 4	(1)	5. 9
December	54	35	70	17	4. 8	2. 4	8. 8	(1)	2. 0
Year	74	51	(2) 103	(3) 9	52. 2	39. 0	63. 6	2	3. 0

[1] Less than 0.5 day.
[2] Average annual highest temperature.
[3] Average annual lowest temperature.

4 days. The lowest temperature ever recorded at Corinth was 8° below zero on January 13, 1918. On the average about 8 days out of 17 have a temperature of 32° or lower in December and January. On the other hand, the temperature was no colder than 10° in about half the years.

The probability of receiving extremes in temperatures also is shown in table 8. This table shows, for example, that on the average, in 2 years in 10 at least 4 days in August can be expected to have a temperature of 102° or higher and at least 4 days in January can be expected to have a temperature of 15° or less. The days are not necessarily consecutive. The average annual daily range between the highest and lowest temperatures is about 23 degrees. The range is greatest in October and least in January.

Growth of many plants stops when the temperature drops to 32°. The farmer therefore needs to know the length of the interval between the last temperature of 32°, or lower, in spring and the first such temperature in fall, or the growing season. Probabilities of freezing temperatures in spring and fall for specified dates are given in table 9. On a clear, calm night, frost can form on vegetation if a temperature of 32° is registered in a sheltered area about 4½ feet above ground. Because frost or freezing temperatures at ground level can adversely affect seed and plants, dates for threshold temperatures of 36° and 40° are included in table 9.

The dates shown in table 9 are based on data from the weather station at Corinth and apply to much of the northwestern and southwestern parts of the county. At Corinth the average length of the freeze-free season is 200 days, and it is more than this number in 8 years out of 10. The growing season is likely to be 3 days shorter in the cool northwestern part of the county and about 3 days longer in the warm southeastern part.

The average date of the last 32° temperature at Corinth is March 29. This means that plant seedlings would be killed, on the average, 1 year out of 2 if they were up on March 29. Delaying planting would increase the chance of obtaining a good crop.

Soil temperature varies from place to place in the same field and at the same time depending on the kind of soil and its slope and moisture content. Data on soil temperatures are not available for Alcorn County. Estimates based on information from similar areas, however, indicate that the increase in soil temperature in the months of March through May generally is steady, though irregular. The estimates given here are for the upper 2 inches of a nearly level soil prepared for seeding by broadcast.

On the average it can be expected that the soil temperature will be 68° for about 10 days in about 2 years out of 4 after April 21 and in about 3 years out of 4 after April 28. Soil temperatures can be 68° or higher, however, for a 10-day period and still include a few cold days. It is estimated that in about 5 years out of 10 the minimum soil temperature will drop to 50° or lower on at least 1 day in 10 following April 14. Similarly, soil temperatures can be expected to drop below 55° on at least 1 day in 10 following April 24, and below 60° on at least 1 day in 10 following May 4. The chance of temperatures of 50° or lower occurring after April 24 is 1 in 10.

In this county the Gulf of Mexico is the principal source of moist air. Winter and spring are the wettest seasons, and total precipitation in winter is about one-sixth greater than in spring. Less moisture is received in summer and fall than in spring. Frequent heavy storms

TABLE 9.—*Probabilities of last freezing temperatures in spring and first in fall*

[Data from records at Corinth for period 1931–60. The data has been adjusted to account for years without freeze]

Probability	Dates for given probability at temperature of—				
	24° F. or lower	28° F. or lower	32° F. or lower	36° F. or lower	40° F. or lower
Spring:					
1 year in 10 later than	March 19	April 1	April 15	April 26	May 6
2 years in 10 later than	March 10	March 25	April 9	April 21	April 30
5 years in 10 later than	February 20	March 12	March 29	April 11	April 19
Fall:					
1 year in 10 earlier than	November 5	October 27	October 21	October 12	October 3
2 years in 10 earlier than	November 12	November 2	October 26	October 16	October 8
5 years in 10 earlier than	November 26	November 13	November 4	October 25	October 17

in winter and through the month of March bring large amounts of precipitation. At this time slow-moving, well-developed low pressure systems bring rains that last for several days. The heaviest rains in July generally occur when a number of thundershowers come at the same place several days in succession. Tropical disturbances that move inland in summer and fall are infrequent, but they are likely to bring several days of heavy rain. On the average, fall is the driest season and has the most slow-moving, high pressure areas.

Measurable precipitation occurs in Alcorn County on about 10 days out of 31, but not necessarily on consecutive days. Most of the rainfall comes in showers, and prolonged rains generally occur in winter. From one-half to more than two-thirds of the months annually will have 1 or more days when rainfall totals 1 inch or more. Table 10 gives the amount of rainfall, lasting for a specified length of time from 1 to 24 hours, that can be expected in the return periods indicated. It was prepared from reports at weather stations in the county and at nearby stations outside the county. The table shows, for example, that at least once in 5 years, 2.1 inches of rain can be expected to fall during a 1-hour period, but only once in 100 years is it likely that as much as 3.3 inches will fall during a period of 1 hour. In general, slightly less rain than shown can be expected to fall in the northern part of the county and slightly more can be expected in the southern part.

Thunderstorms are likely to occur in any month of the year, and the heaviest rains of short duration are associated with these storms. They occur on about 55 to 60 days each year. Thunderstorms are most frequent in July, when they occur on about one-third of the days. These storms generally occur between noon and 6 p.m. Late in winter and early in spring the number of prefrontal squall lines passing over the county increases. These squalls bring the most severe thunderstorms, and tornadoes sometimes develop along these lines. About one tornado a year occurs in the area in which this county is situated. Thundersqualls are more frequent and sometimes are accompanied by damaging winds. Severe storms are infrequent in the county, however, and damage from tropical storms is rare.

The average relative humidity for a year in Alcorn County is about 70 percent. The average annual increase in relative humidity from 6 p.m. to midnight is about 17 percent, and the average decrease from 6 a.m. to noon is about 27 percent.

Some snow generally falls each year, and particularly in January. Snow cover rarely lasts more than a few days, and it generally is less than 1 inch deep.

TABLE 10.—*Amount of rainfall of stated duration to be expected once in the specified number of years*

Duration	Return period of—			
	1 year	5 years	25 years	100 years
	Inch	*Inch*	*Inch*	*Inch*
1 hour	1. 4	2. 1	2. 8	3. 3
3 hours	2. 0	2. 9	3. 7	4. 6
12 hours	2. 8	4. 1	5. 4	6. 6
24 hours	3. 3	4. 9	6. 4	7. 7

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates such as crumbs, blocks, or prisms are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity. The capacity of the soil to hold water in a form available to plants. The difference between the amount of water held in a soil at field capacity and the amount in the same soil at the permanent wilting point. Commonly expressed as inches of water per inch of soil.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Eluviation. The movement of material from one place to another within the soil, in either true solution or colloidal suspension. Soil horizons that have lost material through eluviation are said to be eluvial; those that have received the material are illuvial.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic matter and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Gravel. A size grouping of coarse mineral particles that ranges from 2 millimeters to 3 inches in diameter. Fine gravel consists of particles that range from 2 millimeters to 0.05 inch in diameter.

Horizon, soil. A layer of soil, approximately parallel to the surface that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clays, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused by (1) accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of 1, 2, and 3. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers, and by the height of the water table, either permanent or perched. Relative terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Loam. Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Loess. Geological deposits of fairly uniform, fine material, mostly silt, presumably transported by wind.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension, *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse*, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Parent material. The disintegrated and partly weathered rock from which soil has formed.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Plowpan. A compacted layer formed in the soil immediately below the plowed layer.

Reaction, soil. The degree of acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour' soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Rill. A steep-sided channel resulting from accelerated erosion. A rill normally is a few inches in depth and width and is not large enough to be an obstacle to farm machinery.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on relatively steep slopes and in swelling clays, where there is marked change in moisture content.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that 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.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand), or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically the part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which plants (specifically sunflower) wilt so much that they do not recover when placed in a dark, humid atmosphere.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. In referring to a capability unit or woodland group, read the introduction to the section it is in for general information about its management. Information on wildlife habitat areas is on pages 31 and 32. Other information is given in tables as follows:

Acreage and extent, table 1, p. 5.
Estimated yields, table 2, p. 26.
Engineering uses of soils, tables 3, 4, and 5, pp. 34 through 44.
Recreational uses, table 6, p. 46.

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