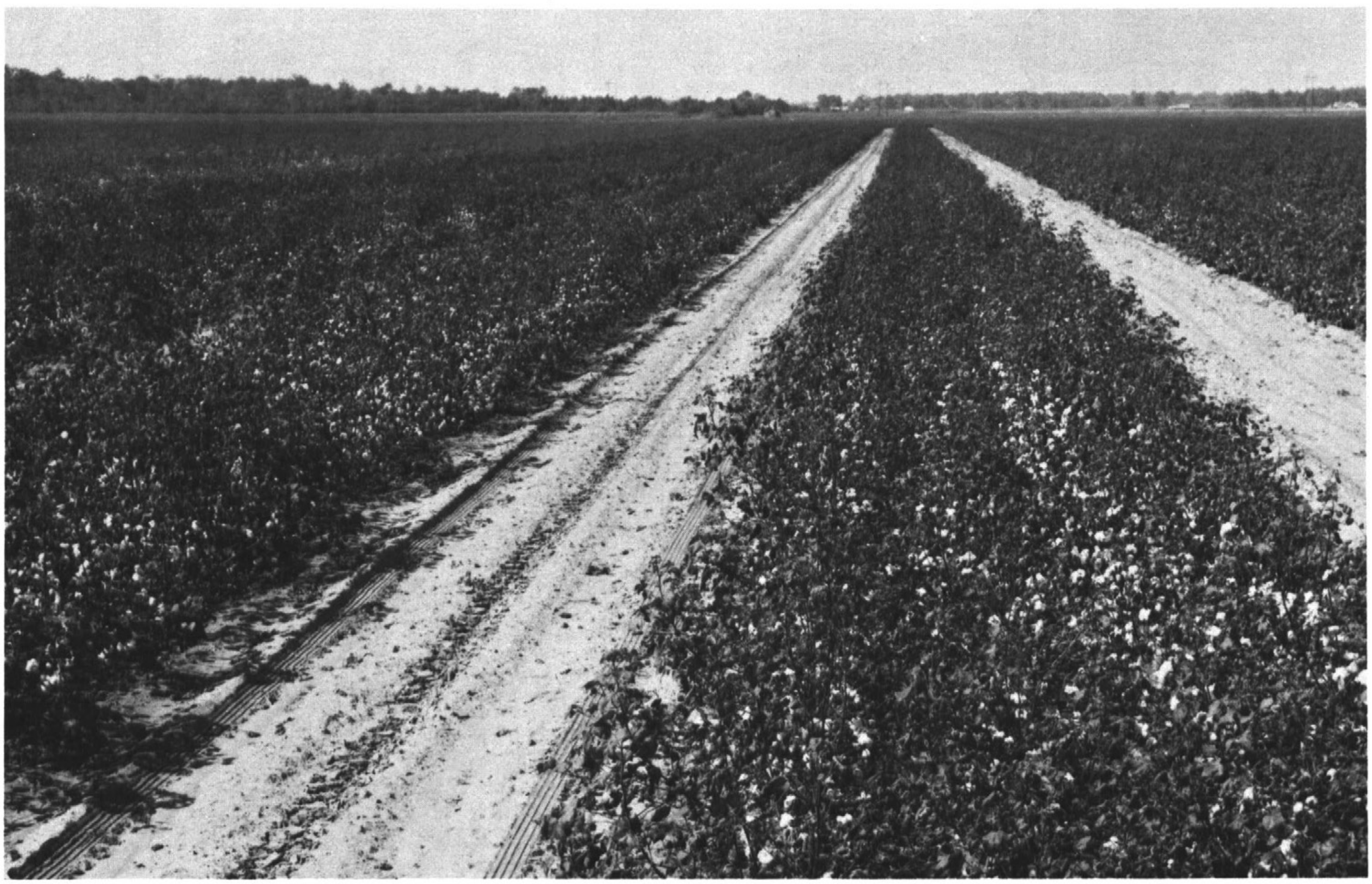
Issued June 1971

SOIL SURVEY

Mississippi County, Arkansas



UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
In cooperation with
ARKANSAS AGRICULTURAL EXPERIMENT STATION

Major fieldwork for this soil survey was done in the period 1956-66. Soil names and descriptions were approved in 1967. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1967. This survey was made cooperatively by the Soil Conservation Service and the Arkansas Agricultural Experiment Station. It is part of the technical assistance furnished to the Mississippi County Conservation District.

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

HOW TO USE THIS SOIL SURVEY

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

Locating Soils

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

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

Finding and Using Information

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

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay on 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 capability units.

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

Community planners and others can read about soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the section "Nonfarm Uses of Soils."

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

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

Newcomers in Mississippi 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 section "General Nature of the County," which gives additional information about the county.

Cover: Cotton growing on Tiptonville and Dubbs silt loams.

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Issued June 1971

SOIL SURVEY OF MISSISSIPPI COUNTY, ARKANSAS

BY DICK V. FERGUSON AND JAMES L. GRAY, SOIL CONSERVATION SERVICE

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

MISSISSIPPI COUNTY is in the northeastern part of Arkansas (fig. 1). It covers a total area of 932 square miles, or 596,480 acres, of which the approximate land area is 582,000 acres. It is irregular in shape and has a maximum length of about 38 miles and a maximum width of about 36 miles. Osceola, a county seat, is near the Mississippi River in the east-central part of the county. In 1960 the population of the county was 70,174.

The Mississippi River and abandoned channels form the boundary between Mississippi County and the State of Tennessee. The county consists of generally level alluvium deposited by the Mississippi River. Soils of the bottom lands are susceptible to flooding by the river and its tributaries. Constructing levees and floodways has reduced the flood hazard.

The soils of the county were derived from alluvium. A large supply of ground water is available for farming and industry. In most places the soils contain moderate to large amounts of plant nutrients.

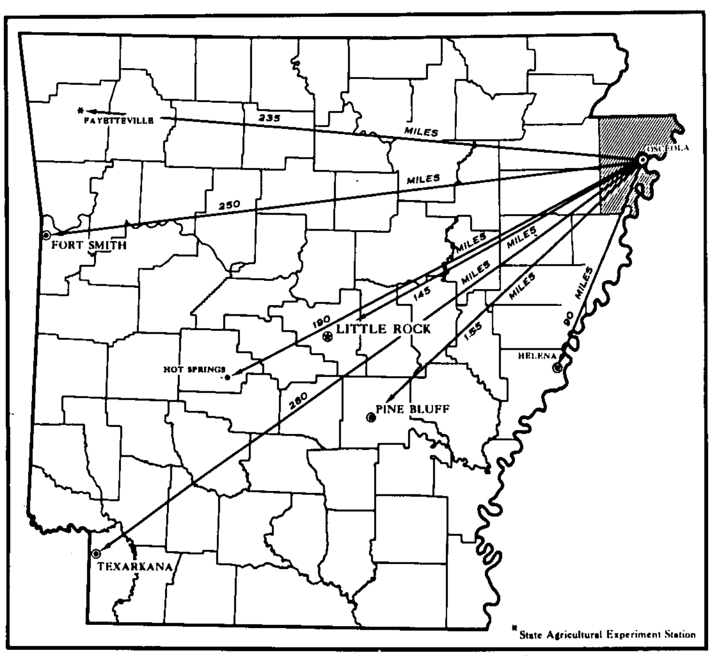

Figure 1.—**Location of Mississippi County in Arkansas. Distances shown are from Osceola, one of the two county seats.**

A small acreage is in rice and permanent pasture. Cotton, soybeans, and alfalfa are the main crops.

The rainfall is more than that needed for most crops, but during the year it is not distributed evenly. In winter and spring drainage is needed in many areas for disposal of excess water. In summer supplemental irrigation benefits most crops when the water supply is limited.

How This Survey Was Made

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

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

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

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

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

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

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

A soil complex consists of areas of two or more soils, so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Bruno-Crevasse complex is an example.

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

In most areas surveyed there are places where the soil material is so rocky, so altered by man's activity, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Borrow pits is an example.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are also 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.

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

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Mississippi 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 suit-

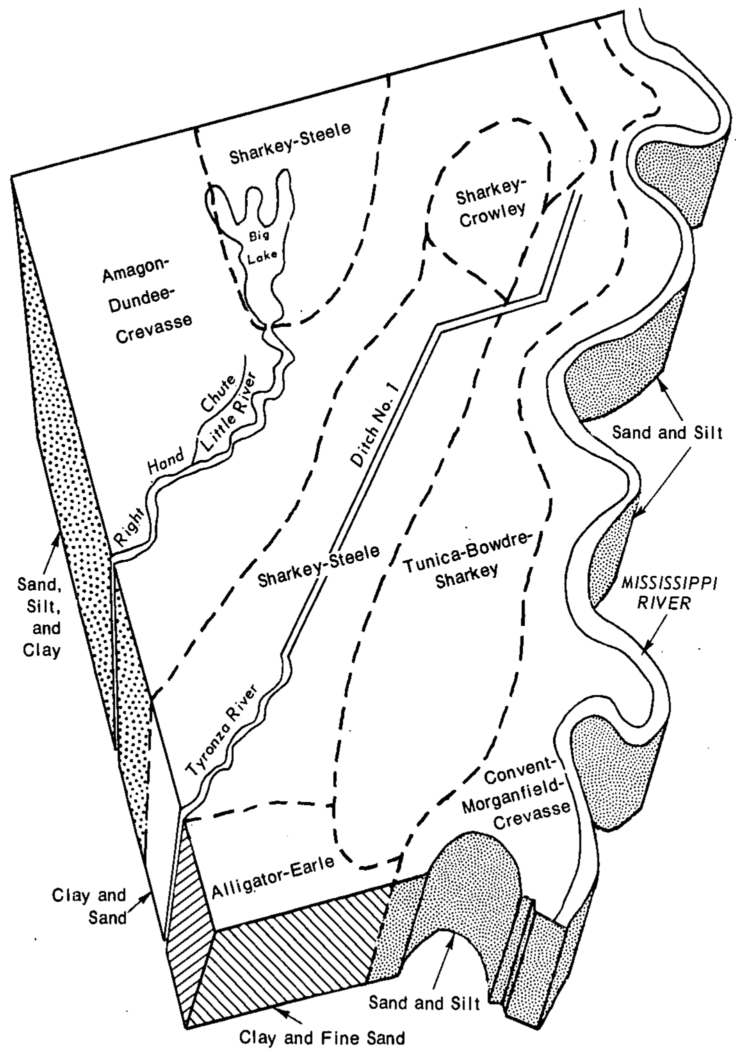

***Figure 2.*—Pattern of soils in Mississippi County.**

able for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in depth, texture, drainage, and other characteristics that affect management.

The general pattern of soils in Mississippi County is shown in figure 2. This small map is not detailed enough for planning operations on an individual farm, but it is useful in presenting a broad picture of the general nature and distribution of the soils.

Descriptions of the six soil associations in Mississippi County are given on the following pages.

1. Amagon-Dundee-Crevasse Association

Poorly drained and somewhat poorly drained soils that are loamy throughout and excessively drained soils that are sandy throughout

This association is in an area of sand blows and loamy and sandy materials in the northern and northwestern parts of the county. The city of Blytheville and the Blytheville Air Force Base are within the association. Low patches of grayish-brown sand dot the dark surface of this association. The sand blows normally are rounded patches that are 8 to 15 feet across and 3 to 6 inches high. Linear blows are as much as 100 feet wide and 600 feet or more long. In most places, the sand blows are low, are rounded, and have concave slopes. They generally do not have central depressions, but a few craterlike depressions have been seen. These sand blows stand out strongly against the intermingled dark soil. Between the mounds are broad, level areas that are loamy and sandy. These areas are broken in places by narrow shallow depressions that are sluggish intermittent drains. Parts of the association in the Big Lake National Wildlife Refuge, and in the floodway along the Right Hand Chute of Little River, are subject to flooding, mainly in winter and spring.

This association makes up about 31 percent of the county. Of this, about 40 percent is Amagon soils, 25 percent is Dundee soils, 25 percent is Crevasse soils, and the remaining 10 percent is Sharkey, Jeanerette, and Iberia soils.

The Amagon soils are at the lowest elevations and are poorly drained. Their surface layer typically is dark grayish-brown sandy loam underlain by a few inches of gray silt loam. The subsoil is gray and light brownish-gray silty clay loam mottled with yellowish red, strong brown, yellowish brown, and reddish yellow.

The Dundee soils are at intermediate elevations between Amagon and Crevasse soils. They are somewhat poorly drained. The surface layer typically is dark grayish-brown sandy loam or silt loam. The subsoil is dark grayish-brown and grayish-brown dominantly clay loam mottled with yellowish brown. Below this are mottled brown, grayish-brown, and yellowish-brown sediments of silt loam to loamy sand.

The Crevasse soils are at the highest elevations. They are excessively drained. The surface layer is very dark grayish-brown to pale-brown loamy sand, and the underlying material is pale-brown and dark grayish-brown loamy sand and sand.

Amagon and Dundee soils are well suited to farming where surface drainage is provided. Crevasse soils are so permeable and droughty that they are only fairly well suited. All of this association is cultivated except for a few small wooded areas along some bayous and a small strip in the Big Lake National Wildlife Refuge.

The average farm is about 160 acres in size and is operated by its owner. A few farms are rented. The farms in this association are highly mechanized, and the association is one of the major areas in the county for growing cotton, soybeans, and small grains.

2. Sharkey-Steele Association

Poorly drained soils that have a thick clayey subsoil and moderately well drained soils that are sandy in the upper part and clayey in the lower part

This association is in an area called sunken land. It consists of broad flats mainly in the central part of the county.

This association covers about 23 percent of the county. Of this, about 67 percent is Sharkey soils, 28 percent is Steele soils, and 5 percent is Tunica soils.

Sharkey soils are at the lower elevations. These soils are poorly drained, and they formed in thick beds of clayey sediment that was deposited by still or slow-moving water. The surface layer typically is very dark grayish-brown silty clay. The subsoil is dark-gray or gray clay that is mottled with dark brown and dark yellowish brown.

Steele soils are at slightly higher elevations than the Sharkey soils and are moderately well drained. They formed in sandy and clayey sediments. The sandy sediments are 20 to 36 inches thick over mainly clay. The upper sandy part of the sediments was deposited by fast-moving water, but the clayey part was deposited by still or slow-moving water. The surface layer typically is dark grayish-brown loamy sand. The upper part of the underlying material dominantly is grayish-brown loamy sand that is mottled with yellowish brown. Below this is dark-gray clay mottled with yellowish brown.

These soils are suited to farming if surface drainage is provided. About 35 percent of the association is woodland in the Big Lake National Wildlife Refuge and an adjacent State-owned game management area. This part is subject to frequent flooding because it is outside the levee and within a floodway that is flooded to produce habitat for migratory waterfowl. The rest of the association is protected from flooding by a levee. Most of the farmland in the protected area is cultivated, but hardwood trees grow in a few small patches along some drainage ditches.

Most of the farms in this association have well-kept farmsteads; small houses for laborers are scattered throughout the farms. The average farm is about 400 acres in size and is highly mechanized. Owners operate about 40 percent of the farms in the association, and the other farms are rented. Soybeans is the major crop, but cotton and grain sorghum are commonly grown.

3. Sharkey-Crowley Association

Poorly drained soils that are clayey in some part of the subsoil

This association is part of the Blytheville dome, an area in the northeastern part of the county that was uplifted about 10 to 15 feet (*6*).[1] It consists of broad flats. The soils in this association formed in sediments deposited mainly by slack water.

This association makes up about 4 percent of the county. Of this, about 60 percent is Sharkey soils, 30 percent is Crowley soils, and the remaining 10 percent is Tunica and Commerce soils.

Sharkey soils are at the lower elevations and are poorly drained. They formed in thick beds of clayey sediments deposited by still or slow-moving water. The surface layer typically is very dark grayish-brown silty clay. The subsoil is dark-gray or gray clay mottled with dark brown and dark yellowish brown.

The Crowley soils are at slightly higher elevations than the Sharkey soils. These poorly drained soils formed in thick beds of loamy and clayey sediments. The surface layer typically is silt loam that is dark grayish brown, or brown, and the subsurface layer is light-gray silt loam mottled with grayish brown, yellowish brown, and yellowish red. The upper part of the sub-soil is light brownish-gray silty clay and silty clay loam mottled with yellow and yellowish brown. The lower part of the subsoil is silty clay loam and silt loam mottled with brownish yellow and yellowish red.

This association is well suited to farming where surface drainage is provided, and most of it is cultivated. Most of the farms have well-kept farmsteads, and houses for laborers are scattered throughout the farms. The average farm is highly mechanized and is about 400 acres in size. About 50 percent of the farms are operated by their owners, and the other farms are rented. This association makes up one of the major areas in the county for growing cotton and soybeans. Grain sorghum, small grains, and alfalfa are also commonly grown.

4. Tunica-Bowdre-Sharkey Association

Moderately well drained and poorly drained soils that are clayey in some part of the subsoil

This association is at higher elevations than the sunken land to its west. It is in a band that varies in width but is roughly parallel to the Mississippi River and extends southwestward from the northern boundary of the county almost to the southern boundary. Many bayous are within the association.

This association makes up about 18 percent of the county. Of this, about 45 percent is Tunica soils, 25 percent is Bowdre soils, and 20 percent is Sharkey soils. The remaining 10 percent consists of Commerce and Morganfield soils.

The poorly drained Tunica soils are at the lower elevations. Their surface layer typically is very dark grayish-brown silty clay. The subsoil is mottled throughout with dark yellowish brown. The upper part is mottled dark-gray clay, and the lower part is gray silty clay loam. This is underlain by grayish-brown silt loam.

Bowdre soils are moderately well drained and are on the tops of low, gentle rises above fairly broad flats. Typically, their surface layer is very dark brown silty clay loam. The subsoil is very dark grayish-brown silty clay mottled with yellowish brown in the upper part. The lower part is brown loam mottled with yellowish brown and gray. Below this is mottled light-gray, yellowish-brown, and brown fine sandy loam.

Sharkey soils are at the lower elevations and are poorly drained. They formed in thick beds of clayey sediment. The surface layer typically is very dark grayish-brown silty clay, and the subsoil is dark-gray or gray clay that is mottled.

Part of this association is between the Mississippi River and its levee and is subject to frequent flooding. Despite the hazard of flooding, most of this part of the association is cultivated. Most of the farmers live outside the overflow area, and they commute to their farms between the floods.

Most of this soil association is well suited to farming where surface drainage is provided. All of it, except for a few small wooded areas along bayous, is cultivated.

Most farms have well-kept farmsteads, and small houses for laborers are scattered throughout the farms. The average farm is about 300 acres in size and highly mechanized. About 40 percent of the farms are operated by their owners, and the rest are rented. Cotton and soybeans are the major crops, and grain sorghum, small grains, and alfalfa are commonly grown.

5. Convent-Morganfield-Crevasse Association

Somewhat poorly drained to well-drained soils that are loamy throughout and excessively drained soils that are sandy throughout

This association is on the natural levee that borders the Mississippi River and its former channels. Some parts of the association are on broad flats. The other parts are on low narrow ridges about 1 foot higher than the flats.

This association covers about 18 percent of the county. Of this, about 40 percent is Convent soils, 35 percent is Morganfield soils, and 20 percent is Crevasse soils. The rest consists of small areas of Sharkey and Hayti soils.

Convent soils are at the lower elevations. They are somewhat poorly drained. Their surface layer typically is brown fine sandy loam over a few inches of loam. Below this is dark grayish-brown and mottled light-gray and dark yellowish-brown silt loam.

Morganfield soils are well drained and are at intermediate elevations between Convent and Crevasse soils. Their surface layer typically is brown fine sandy loam over a few inches of dark grayish-brown silt loam. Below this is brown to very pale brown silt loam and very fine sandy loam.

The Crevasse soils are excessively drained and generally are on the crest of natural levees. Their surface

[1] Italic numbers in parentheses refer to Literature Cited, p. 56.

layer is very dark grayish-brown loamy sand. It overlies pale-brown and dark grayish-brown loamy sand and sand.

Convent and Morganfield soils are well suited to farming, but Crevasse soils are so permeable and droughty that they are only fairly well suited.

About 75 percent of the soil association is inside the levee system where most farms are protected from flooding. These farms have well-kept farmsteads, and small houses for laborers are scattered throughout the farms. Almost all of the protected acreage is cultivated. The principal crops are cotton, soybeans, small grains, grain sorghum, and alfalfa. This is one of the major areas in the county for growing cotton. The levee along the Mississippi River provides bermudagrass pasture for beef cattle.

The average farm is about 500 acres in size and highly mechanized. About half of the farms are operated by their owners, and the rest are rented.

About 25 percent of the soil association is outside the levee system along the Mississippi River, and frequent flooding is likely. Bayous have cut this area, and oxbow lakes are in some abandoned channels of the river. About 10 percent of this part of the association is wooded, and the rest is cultivated or in bermudagrass. Only a few houses are outside the levee. Almost all the owners and laborers live elsewhere and commute to the farms between floods.

6. Alligator-Earle Association

Poorly drained and somewhat poorly drained soils that have a dominantly clayey subsoil

This association is in the southwestern part of the county. It consists of broad flats and of ridges that rise about a foot above the flats.

This association makes up about 6 percent of the county. Of this, about 60 percent is Alligator soils, 30 percent is Earle soils, and the remaining 10 percent is Dundee and Amagon soils.

The Alligator soils are at the lower elevations and are poorly drained. They formed from thick beds of clayey sediments. Alligator soils are locally called gumbo soils. Their surface layer typically is very dark gray clay. The subsoil is gray clay mottled with yellowish brown and strong brown.

The Earle soils are slightly higher than the Alligator soils. They developed in beds of clayey sediments that are 20 to 36 inches thick and that are underlain by coarser textured materials. The surface layer typically is dark-brown clay. The upper part of the subsoil is light brownish-gray silty clay mottled with yellowish red and strong brown. The lower part of the subsoil is mottled grayish-brown silt loam. It is underlain by dark-gray sediments.

The soils in this association are suited to farming, and about 95 percent of the acreage is cultivated. The rest is small patches of hardwood trees.

Most of the farms have well-kept farmsteads, and small houses for laborers are scattered throughout the farms. The average farm is about 400 acres in size and is highly mechanized. About 50 percent of the farms are operated by their owners, and the other farms are rented. Soybeans, cotton, and grain sorghum are commonly grown.

Descriptions of the Soils

In this section the soil series and the mapping units in each series are described. The acreage and proportionate extent of each mapping unit are given in table 1.

The procedure 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 that unit and also the description of the soil series to which it belongs. The description of a soil series mentions features that apply to all the soils in a series. Differences among the soils of one series are pointed out in the description of the individual soils or are indicated in the soil name. Unless otherwise indicated, the colors described are for a moist soil. As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Alluvial land, for example, is a miscellaneous

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

Soil	Area	Extent
	Acres	*Percent*
Alligator clay	11,053	1.9
Alluvial land	422	.1
Amagon sandy loam	12,550	2.1
Borrow pits	4,902	.8
Bowdre silty clay loam	22,289	3.7
Bruno-Crevasse complex	5,150	.9
Commerce silt loam	4,342	.7
Convent fine sandy loam	14,305	2.4
Crevasse loamy sand	9,645	1.6
Crowley silt loam	2,064	.3
Dundee silt loam	36,361	6.1
Dundee-Dubbs-Crevasse complex	2,772	.5
Earle clay	5,293	.9
Forestdale silt loam	1,405	.2
Forestdale silty clay loam	2,705	.5
Forestdale-Routon complex	1,642	.3
Hayti fine sandy loam	11,416	1.9
Iberia clay	1,342	.2
Jeanerette silt loam	7,495	1.3
Morganfield fine sandy loam	4,935	.8
Routon-Dundee-Crevasse complex	50,424	8.5
Sharkey silty clay loam	4,037	.7
Sharkey silty clay	85,631	14.4
Sharkey-Crevasse complex	11,961	2.0
Sharkey-Steele complex	124,134	20.8
Sharkey and Steele soils	15,065	2.5
Steele loamy sand	8,050	1.3
Steele silty clay loam	19,219	3.2
Steele and Crevasse soils	4,348	.7
Steele and Tunica soils	20,009	3.4
Tiptonville and Dubbs silt loams	7,893	1.3
Tunica silty clay	66,845	11.2
Levee area	2,284	.4
Water area	14,492	2.4
Total	596,480	100.0

land type that does not belong to a soil series. It is listed, nevertheless, in alphabetic order along with the soil series.

A profile typical for each series is described in two ways. Many will prefer to read the short description in narrative form. It is the second paragraph in the series description. The technical profile is mainly for soil scientists and others who want detailed information about the soils. Some of the terms used to describe the soils are defined in the Glossary at the back of this soil survey. Others are defined in the "Soil Survey Manual" (*11*).

Following the name of each mapping unit is a soil symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of the mapping unit is the capability unit into which the mapping unit has been placed. The pages on which each of the groups is described are given in the "Guide to Mapping Units" at the back of this survey.

Alligator Series

The soils of the Alligator series consist of very dark gray, dark-gray, and gray clayey soils on broad flats. These soils are poorly drained. They formed in thick beds of fine-textured sediments deposited by slack water.

Alligator soils are adjacent to the somewhat poorly drained Earle and the moderately well drained Bowdre soils. The Alligator soils are more poorly drained than the Earle and Bowdre soils and formed in thicker beds of clay.

Typical profile of Alligator clay in a cultivated area (SE¼NE¼SE¼ of section 20, T. 10 N., R. 8 E.):

Ap—0 to 9 inches, very dark gray (10YR 3/1) clay; weak, medium, granular structure; plastic; many small roots; few, fine, dark concretions; lower 2 inches has some yellowish-red coatings in root channels; medium acid; clear, smooth boundary.

Bg—9 to 20 inches, gray (10YR 5/1) clay; common, fine and medium, prominent mottles of yellowish brown and strong brown; massive (structureless) to weak subangular blocky structure; hard, firm, plastic; few small roots; few small pores; few, fine, dark concretions; some root channels filled with very dark gray (10YR 3/1) clay; strongly acid; gradual, wavy boundary.

C1g—20 to 51 inches, gray (10YR 5/1) clay; common, fine and medium, distinct mottles of dark yellowish brown and strong brown; massive (structureless); hard, firm, plastic; few small roots; abundant small pores; few, fine, dark concretions; some root channels and cracks filled with very dark gray (10YR 3/1) clay; few slickensides; strongly acid; gradual, wavy boundary.

C2g—51 to 74 inches, gray (10YR 5/1) clay; many, medium, distinct mottles of yellowish red and yellowish brown; massive (structureless); hard, firm, plastic; few small roots; few, small, brown concretions; few to common, medium calcium carbonate concretions; few root channels filled with very dark gray (10YR 3/1) clay; neutral.

The A horizon is very dark gray or dark gray. The B and C horizons range from dark gray to gray. When dry, this soil cracks to a depth of 20 inches or more. In the A, B, and C1 horizons, reaction ranges from very strongly acid to medium acid.

Alligator clay (Aa).—This soil has a very dark gray or dark-gray clay surface layer 9 to 12 inches thick. The subsoil extends to a depth of about 20 inches and is gray clay mottled with yellowish brown and strong brown. The underlying material is gray mottled clay.

A few spots of Earle and Bowdre soils are included in mapping. Also included in some places are undulating areas made up of narrow depressions alternating with low rises.

This soil contracts and cracks when dry. It expands and the cracks seal when the soil gets wet. Water moves through this soil very slowly, except when it is cracked; then water enters rapidly until the cracks seal. The available water capacity is high, and response to fertilizer and lime is good. Natural fertility is moderate to high. This soil is very strongly acid or strongly acid.

Maintaining tilth and preparing a seedbed are difficult because of the high content and kind of clay in the soil. This soil can be cultivated only within a narrow range of moisture content. Unless surface drains are provided, farming operations are commonly delayed after a rain. Where it is drained and well managed, this soil is suited to commonly grown crops. (Capability unit IIIw-1)

Alluvial Land

Alluvial land (Ad) consists of soil material deposited along the Mississippi River. The river overflows frequently and deposits fresh alluvium ranging from clay to loamy sand. These deposits frequently change the characteristics of the soil. This land is poorly drained to excessively drained and is neutral to moderately alkaline.

Included in mapping are undulating areas that consist of narrow depressions alternating with low rises.

Almost all of the acreage is wooded, but some is barren. Protecting Alluvial land from floods is not feasible. This land is well suited as woodland and as wildlife habitat. (Capability unit VIIw-1)

Amagon Series

The soils of the Amagon series consist of dark grayish-brown sandy loam over a subsurface layer of gray silt loam. The subsoil is gray silty clay loam mottled with yellowish red, strong brown, yellowish brown, and reddish yellow. These soils are poorly drained.

Amagon soils occur on the lower part of natural levees that border stream channels, where they formed in loamy alluvium. They are adjacent to the somewhat poorly drained Dundee soils and the poorly drained Forestdale soils. The Amagon soils are more poorly drained than the Dundee soils and are less clayey in the upper part of the subsoil than the Forestdale soils.

Typical profile of Amagon sandy loam in a cultivated area (NW¼NW¼NW¼ of section 27, T. 16 N., R. 8 E.):

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, medium, granular structure; friable; abundant small roots; medium acid; abrupt, smooth boundary.

A2g—8 to 15 inches, gray (10YR 6/1) silt loam; common, fine, distinct mottles of dark yellowish brown and few, fine, prominent mottles of dark reddish brown; weak, medium, subangular blocky structure; friable; abundant small roots and fine pores; abundant, small and medium, dark concretions; slightly acid; clear, wavy boundary.

B21tg—15 to 22 inches, gray (10YR 6/1) silty clay loam; common, fine, prominent mottles of yellowish red and strong brown; moderate, medium, subangular blocky structure; firm; clay films on most peds; gray (10YR 6/1) silt coatings on some peds; few small roots; abundant fine pores; abundant, small and medium, dark concretions; strongly acid; clear, wavy boundary.

B22tg—22 to 36 inches, gray (10YR 5/1) silty clay loam; common, medium, distinct mottles of yellowish brown and common, fine, distinct or prominent mottles of yellowish red; moderate, medium, subangular blocky structure; firm; patchy clay films; light-gray (10YR 7/1) silt coatings on some peds; few small roots; abundant fine pores; few, small and medium, dark concretions; very strongly acid; gradual, wavy boundary.

B3g—36 to 60 inches, light brownish-gray (2.5Y 6/2) silty clay loam; common, fine, prominent mottles of yellowish red and common, medium, distinct mottles of reddish yellow; weak, medium, subangular blocky structure; firm; few patchy clay films; light-gray (10YR 7/1) silt coatings on some peds; few small roots; abundant fine pores; few, small and medium, black and brown concretions; strongly acid; gradual, wavy boundary.

Cg—60 to 72 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct mottles of dark brown; massive (structureless); friable; few, small, brown and black concretions; slightly acid.

The B2 horizon is gray or light brownish-gray silty clay loam. The C horizon is silt loam or very fine sandy loam. Except for limed areas, reaction in both the A and B horizons ranges from very strongly acid to medium acid. Where limed, the A horizon ranges to neutral.

Amagon sandy loam (An).—The surface layer of this soil is dark grayish-brown sandy loam 4 to 8 inches thick. The subsurface layer is gray silt loam 4 to 8 inches thick. The subsoil extends to a depth of about 60 inches and consists of gray and light brownish-gray silty clay loam mottled with shades of brown and red.

Included with this soil in mapping are a few spots of Dundee soils. Also included are some areas of soils similar to this Amagon soil that have a darker surface layer. Other included areas are undulating and consist of narrow depressions alternating with low rises.

Water moves through this soil at a slow rate. In places a plowsole that formed beneath plow depth restricts the penetration of roots and the movement of water. This soil is very strongly acid or medium acid. It has high available water capacity and moderate natural fertility. This soil responds well to additions of lime and fertilizer.

Tilth is easy to maintain, but farming operations are commonly delayed after a rain unless surface drains are installed. Well-managed, drained areas of this soil are suited to commonly grown crops. (Capability unit IIIw-2)

Borrow Pits

Borrow pits (Bp) consist of excavations from which soil and underlying materials have been removed for use in building levees. These areas are along the side of the levee next to the Mississippi River and along the levee of the Right Hand Chute of Little River. They run the entire length of the levees.

The pits that hold water all year round are excellent for fishing. Dry pits have a plant cover and are grazed by livestock. Willow trees grow in many borrow areas. (Not assigned to a capability unit)

Bowdre Series

The soils of the Bowdre series consist of very dark brown or dark-brown silty clay loam and silty clay over very dark grayish-brown silty clay mottled with yellowish brown. These soils are moderately well drained.

Bowdre soils are at the higher elevations. They formed in thin beds of dominantly clayey sediments deposited by slack water and underlain by coarser textured sediments. They are adjacent to Tunica, Sharkey, and Steele soils. Bowdre soils developed in thinner beds of clayey sediments than Tunica soils. They are better drained than Tunica and Sharkey soils and are coarser textured in the upper 20 inches than the Sharkey and Steele soils. The Bowdre soils have variable texture to a depth of 74 inches, but the Sharkey soils are clayey to a depth of more than 40 inches, and the Steele soils are loamy sand in the upper part and clay in the lower part.

Typical profile of Bowdre silty clay loam in a cultivated area (SW¼NW¼NE¼ of section 10, T. 10 N., R. 9 E.):

Ap—0 to 6 inches, very dark brown (10YR 2/2) silty clay loam; weak, medium, subangular blocky structure; firm; abundant small roots; few pores; medium acid; abrupt, smooth boundary.

B2—6 to 17 inches, very dark grayish-brown (10YR 3/2) silty clay; common, fine, distinct mottles of yellowish brown; moderate, medium, subangular blocky structure; firm; few small roots; few small pores; slightly acid; clear, smooth boundary.

IIB3—17 to 28 inches, brown (10YR 5/3) loam; few, fine, faint mottles of yellowish brown and gray; weak, medium, subangular blocky structure; friable; few small roots; few small pores; slightly acid; clear, wavy boundary.

IIClg—28 to 68 inches, mottled light-gray (10YR 7/2), yellowish-brown (10YR 5/6), and brown (10YR 4/3) fine sandy loam; massive (structureless); friable; few small roots; few small pores; slightly acid; abrupt, smooth boundary.

IIC2g—68 to 74 inches, gray (10YR 6/1) silt loam; many, medium, prominent mottles of dark reddish brown and few, medium, prominent mottles of strong brown; massive (structureless); friable; few small pores; slightly acid.

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

The B2 horizon is very dark grayish-brown to dark-brown heavy silty clay loam or silty clay. The IIB3 horizon, 5 to 15 inches thick, is brown to brownish-yellow silty clay loam, loam, or silt loam mottled with gray. Depth to the IIB3 horizon ranges from 10 to 20 inches.

The IIC horizon is mottled with gray, yellowish brown, and light gray, or it has a matrix of gray mottled with brown. It ranges from silt loam to sandy loam. Reaction throughout ranges from medium acid to slightly acid.

Bowdre silty clay loam (Br).—This soil has a very dark brown silty clay loam surface layer 4 to 7 inches thick. The upper part of the subsoil is very dark grayish-brown silty clay mottled with yellowish brown. The lower part of the subsoil, about 11 inches thick, is loam mottled with yellowish brown and gray. The underlying material to a depth of about 68 inches is mottled light-gray, yellowish-brown, and brown fine sandy loam. Below this is gray silt loam mottled with dark reddish brown and strong brown. Some areas are subject to frequent flooding.

Included with this soil in mapping are a few spots of Tunica, Sharkey, and Steele soils.

This Bowdre soil contracts and cracks when it dries. When it gets wet, the soil expands and the cracks seal. Water moves through this soil slowly except when it is cracked; then water enters very rapidly until the cracks seal. The available water capacity and natural fertility are high. This soil is medium acid or slightly acid and responds well to additions of lime and fertilizer.

Preparing a seedbed and maintaining tilth are difficult because of the kind of clay the soil contains. This soil can be cultivated within only a narrow range of moisture content. After a rain, farming operations are commonly delayed unless surface drains are provided. Drained areas of this soil are well suited to common crops. (Capability unit IIw-1; if frequently flooded, capability unit Vw-2)

Bruno Series

The soils of the Bruno series consist of dark-brown loamy sand over dark yellowish-brown and brown loamy sand, sandy loam, and sand. These soils are excessively drained.

Bruno soils are at the higher elevations bordering stream channels, where they formed in coarse-textured sediments. They are adjacent to Crevasse soils. Bruno soils have lenses or bands of sandy loam or silt loam about 2 inches thick within 40 inches of the surface, whereas Crevasse soils are loamy sand or sand to a depth of 40 inches or more.

Typical profile of Bruno loamy sand in a cultivated area (SW¼SW¼SW¼ of section 25, T. 16 N., R. 8 E.):

Ap—0 to 7 inches, dark-brown (10YR 4/3) loamy sand; weak, medium, granular structure; friable; abundant small roots; strongly acid; abrupt, smooth boundary.

A1—7 to 19 inches, dark yellowish-brown (10YR 4/4) loamy sand; structureless; friable; abundant small roots; few small pores; strongly acid; clear, wavy boundary.

C1—19 to 32 inches, brown (7.5YR 5/4) sandy loam; many, fine, distinct mottles of pale brown; massive (structureless); friable; few small roots and pores; few, small, black concretions; bands of silt loam about 2 inches thick; medium acid; clear, wavy boundary.

C2—32 to 48 inches, brown (7.5YR 5/4) sand; single grain (structureless); friable; few small roots and pores; few, small, dark concretions; lenses of silt loam and sandy loam about 2 inches thick; strongly acid; clear, wavy boundary.

C3—48 to 56 inches, dark yellowish-brown (10YR 4/4) loam; few, medium, distinct mottles of light gray; massive (structureless); friable; few small roots and pores; few, small, dark concretions; strongly acid; clear, wavy boundary.

C4—56 to 72 inches, yellowish-brown (10YR 5/4) sandy loam; few, medium, distinct mottles of light gray; massive (structureless); friable; strongly acid.

The A horizon is loamy sand or loamy fine sand. Between depths of 10 to 40 inches, Bruno soils are brown, dark yellowish-brown, pale-brown, or light yellowish-brown stratified sandy loam, fine sand, loamy fine sand, loamy sand, or sand without regular sequence. Lenses of finer textured materials occur at a depth of 32 inches. Reaction throughout ranges from strongly acid to mildly alkaline.

Bruno-Crevasse complex (Bv).—This soil complex consists of excessively drained soils that are mainly in the western part of the county. These soils are so intermingled that it is not practical to separate them on the soil map. Bruno soils make up about 55 percent of the complex, and Crevasse soils, 35 percent. The remaining 10 percent consists of included Dubbs and Dundee soils. Also included in mapping are undulating areas in which narrow depressions alternate with low rises.

The surface layer of the Bruno soils is dark-brown loamy sand or loamy fine sand about 7 inches thick over dark yellowish-brown loamy sand about 12 inches thick. The underlying material is brown sandy loam and sand over dark yellowish-brown and yellowish-brown loam and sandy loam. The Crevasse soils have a profile similar to the one described as typical for their series.

Water moves rapidly through these soils. Because they are droughty and have low available water capacity, their use for crops is limited. Natural fertility is low, and the response to additions of fertilizer and lime is moderate. Reaction is strongly acid to mildly alkaline in the Bruno soils and medium acid to mildly alkaline in the Crevasse soils.

Tilth is easy to maintain. Because these soils warm early in spring, crops can be planted early. Strong winds blow in spring and the loss of silt, clay, and organic matter by soil blowing is a severe hazard (fig. 3). The main crops are those that grow in winter and spring when moisture content is high. Under good management, these soils are suited to wheat, oats, and bermudagrass. (Capability unit IIIs-1)

Commerce Series

The soils of the Commerce series consist of dark grayish-brown silt loam over dark grayish-brown, grayish-brown, and gray silt loam and silty clay loam. These soils are somewhat poorly drained.

Commerce soils generally occur on the lower part of natural levees bordering stream channels. They formed in beds of loamy alluvium. Commerce soils are adjacent to Convent, Morganfield, and Hayti soils. They contain more clay than Convent and Morganfield soils. Commerce soils are grayer than Morganfield soils but are not so gray between depths of 10 to 24 inches as are the Hayti soils.

Typical profile of Commerce silt loam in a cultivated field (NE¼SE¼NE¼ of section 21, T. 12, R. 9 E.):

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium to coarse, granular structure; firm; few, small and medium roots; few small wormholes; few small pores; few coatings of silt and small pockets of pale-brown (10YR 6/3) silt; slightly acid; abrupt, smooth boundary.

B—6 to 22 inches, dark grayish-brown (10YR 4/2) silty clay loam; few, fine, distinct mottles of yellowish brown and common, fine, faint mottles of gray; weak, medium, subangular blocky structure; firm;

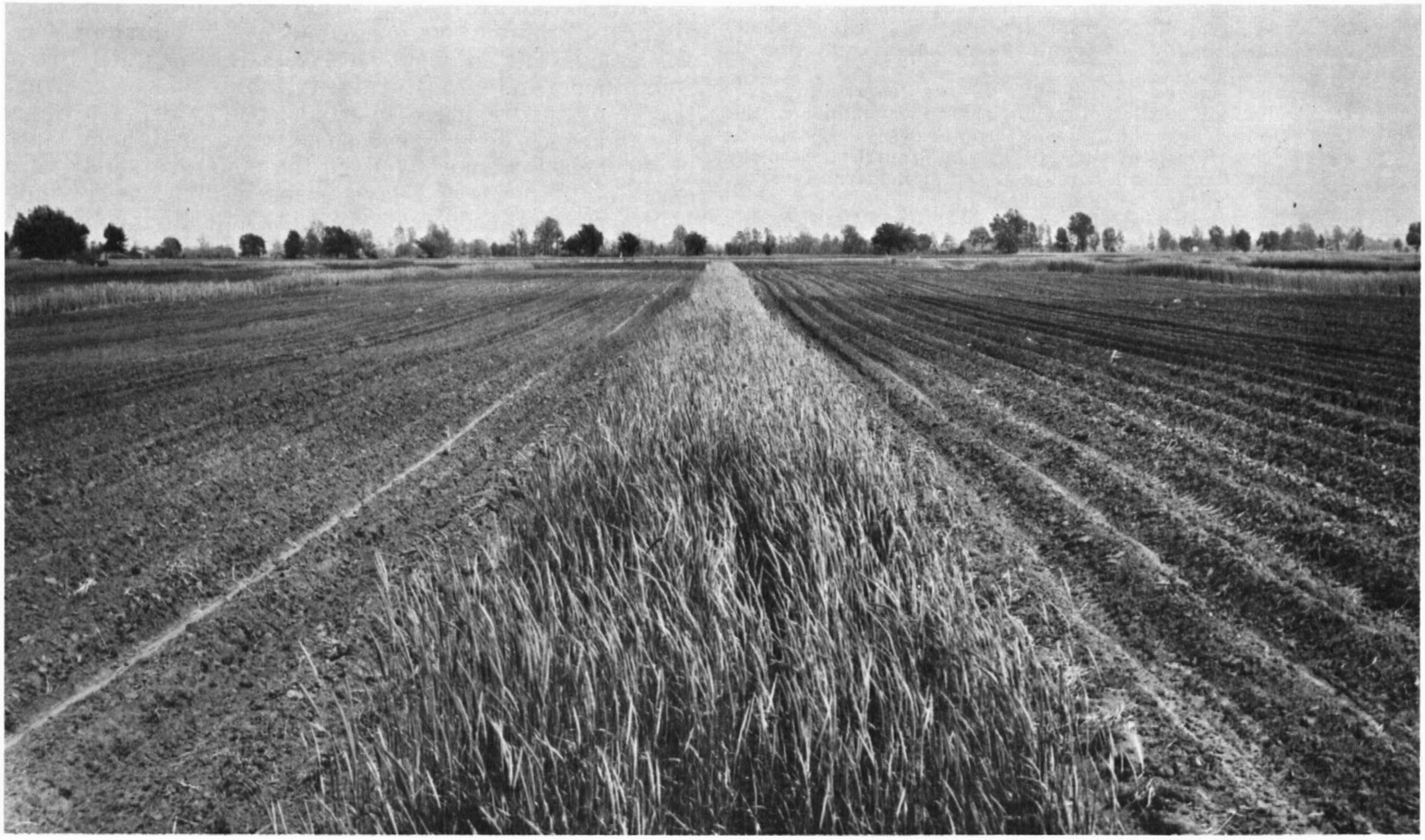

Figure 3.—**Strips of rye alternating with strips prepared for row crops help to control soil blowing on the Bruno-Crevasse complex.**

few, small and medium roots; few small pores; few, small, brown concretions; neutral; clear, wavy boundary.

C1—22 to 58 inches, grayish-brown (10YR 5/2) silt loam; common, fine, distinct mottles of strong brown and dark brown; massive (structureless); friable; a few small roots and pores; few, medium, brown concretions; layers of dark-gray silt loam and silty clay loam about 2 inches thick; mildly alkaline; abrupt, smooth boundary.

C2—58 to 80 inches, gray (10YR 5/1) silty clay loam; common, medium, faint mottles of dark yellowish brown and few, fine, prominent mottles of dark red; massive (structureless); firm; few small pores; mildly alkaline.

The A horizon is dark grayish brown or grayish brown. In places the C1 horizon consists of stratified layers of silt and silty clay loam. Reaction throughout ranges from slightly acid to moderately alkaline.

Commerce silt loam (Cm).—This soil has a dark grayish-brown silt loam surface layer about 6 inches thick. The subsoil is dark grayish-brown silty clay loam that is mottled and about 16 inches thick. The underlying material is grayish-brown and gray silty clay loam and silt loam mottled with yellowish brown, gray, strong brown, and dark brown. Some areas of this soil are frequently flooded. Included with this soil in mapping are a few small spots of Morganfield and Convent soils.

Water moves into and through this soil at a moderate rate. In places a plowsole formed beneath plow depth restricts the penetration of roots and the movement of water through the soil. This soil is slightly acid to moderately alkaline. The available water capacity and natural fertility are high. Response to additions of fertilizer is good, and additions of lime are beneficial in some areas.

Tilth is easy to maintain. This soil is well suited to most common crops in areas not subject to frequent flooding. (Capability unit I–1; if frequently flooded, capability unit Vw–2)

Convent Series

The soils of the Convent series consist of brown fine sandy loam over loam, very fine sandy loam, and silt loam mottled with yellowish brown, dark brown, light gray, and dark yellowish brown. These soils are somewhat poorly drained.

Convent soils are generally on the lower part of natural levees that border the stream channels. They formed in stratified beds of sandy and silty alluvium. Convent soils are adjacent to Commerce and Hayti soils. Convent soils contain less clay than Commerce soils and are browner than Hayti soils, which are dominantly gray below a depth of 10 inches.

Typical profile of Convent fine sandy loam in a cultivated area (SE¼NW¼SE¼ of section 12, T. 11 N., R. 10 E.):

Ap—0 to 7 inches, brown (10YR 4/3) fine sandy loam; weak, medium, granular structure; friable; abundant small roots; mildy alkaline; abrupt, smooth boundary.

A1—7 to 11 inches, brown (10YR 4/3) loam; few, fine, distinct mottles of yellowish brown, mainly in the lower part; massive (structureless); friable to loose; bands of silt less than one-fourth inch thick; abundant small pores and roots; moderately alkaline; abrupt, wavy boundary.

C1—11 to 23 inches, dark grayish-brown (10YR 4/2) silt loam; common, fine, distinct mottles of dark brown; massive (structureless); friable; abundant small roots and pores; some root channels filled with brown (10YR 4/3) fine sandy loam; neutral; gradual, wavy boundary.

C2g—23 to 39 inches, mottled light-gray (10YR 6/1) and dark yellowish-brown (10YR 4/4) silt loam; massive (structureless); friable; abundant small roots and pores; mildly alkaline; clear, wavy boundary.

C3g—39 to 61 inches, light brownish-gray (10YR 6/2) very fine sandy loam; common, medium, distinct mottles of strong brown and faint light gray; mottles are more numerous in the lower part; massive (structureless); friable; abundant small pores, some filled with grayish-brown (10YR 5/2) silty clay loam; few small roots; neutral; gradual, wavy boundary.

C4g—61 to 74 inches, gray (10YR 5/1) silt loam; common, medium, distinct mottles of dark yellowish brown and brown; massive (structureless); friable; abundant small pores; few small roots; few mollusk shells ¼ inch to 2 inches in length; mildly alkaline.

The Ap horizon is brown, dark grayish brown, or yellowish brown. The amount of clay between depths of 10 and 40 inches ranges from 8 to 18 percent, and the amount of sand coarser than very fine sand is less than 15 percent. Reaction throughout ranges from slightly acid to moderately alkaline.

Convent fine sandy loam (Cn).—This soil has a brown fine sandy loam surface layer 5 to 8 inches thick over about 4 inches of brown loam. The underlying material is dark grayish-brown, light-gray, light brownish-gray, and dark yellowish-brown layers of loamy sediments mottled with yellowish brown, strong brown, and light gray. Some areas of this soil are frequently flooded.

Included with this soil in mapping are a few spots of Commerce and Hayti soils. Also included are areas of a soil that has a silt loam surface layer and undulating areas that consist of narrow depressions alternating with low rises.

Water moves through this soil at a moderate rate. In some places a plowsole that formed beneath plow depth restricts the penetration of roots and the movement of water. Available water capacity is high. Natural fertility is moderate to high. Response to additions of fertilizer is good, and some areas respond to lime. This soil is slightly acid to moderately alkaline.

Tilth is easy to maintain. Where it is not frequently flooded, this soil is well suited to commonly grown crops. (Capability unit I–1; if frequently flooded, capability unit Vw–2)

Crevasse Series

The soils of the Crevasse series consist of very dark grayish-brown loamy sand over pale-brown and dark grayish-brown loamy sand and sand. These soils are excessively drained.

Crevasse soils are on natural levees bordering stream channels, where they formed in sandy alluvium. Crevasse soils are adjacent to excessively drained Bruno soils, moderately well drained Dubbs soils, somewhat poorly drained Dundee soils, and poorly drained Sharkey and Steele soils. Crevasse soils are sandy to a depth of 40 inches or more, but Bruno soils are sandy to a depth of 48 inches and have lenses of silt loam or sandy loam. Crevasse soils contain less silt and clay than Dubbs and Dundee soils. They are sandier than Sharkey and Steele soils, which have a high content of clay.

Typical profile of Crevasse loamy sand in a cultivated field (SE½NE¼SE¼ of section 17, T. 14 N., R. 8 E.):

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) loamy sand; weak, medium, granular structure; loose; few small roots; slightly acid; abrupt, smooth boundary.

C1—6 to 36 inches, pale-brown (10YR 6/3) sand; few, medium, distinct mottles of dark yellowish brown (10YR 4/4) and yellow (10YR 7/8); single grain (structureless); loose; few small roots in upper 18 inches; few, small, soft, dark concretions; neutral; abrupt, smooth boundary.

C2—36 to 65 inches, dark grayish-brown (10YR 4/2) sand; few, fine, distinct mottles of yellow (10YR 7/8); single grain (structureless); loose; few, small, dark concretions; lenses of organic debris that resembles coffee grounds; neutral; abrupt, wavy boundary.

The Ap horizon is very dark grayish-brown or pale-brown loamy sand, sandy loam, or sand. The C horizon is sand or loamy sand. Reaction ranges from medium acid to mildly alkaline.

Crevasse loamy sand (Cr).—This soil has a surface layer of very dark grayish-brown to pale-brown loamy sand 5 to 10 inches thick that overlies brown and dark grayish-brown loamy sand and sand. Some areas are frequently flooded.

Included with this soil in mapping are a few spots of Bruno soils. Also included are areas that have a sandy loam surface layer and undulating areas that consist of narrow depressions alternating with low rises.

Water moves through this soil rapidly. Because this soil is droughty and has low available water capacity and natural fertility, its use for cultivated crops is limited. Reaction is medium acid to mildly alkaline, and the response to additions of fertilizer and lime is moderate.

Maintaining tilth is easy on this soil. Crops can be planted early in spring because this soil warms early. Crops grow well in winter and spring because the moisture content is high during these seasons. Strong winds blow in spring and loss of silt, clay, and organic matter by soil blowing is a severe hazard. Well-managed areas that are protected from flooding are suited to wheat, oats, and bermudagrass. (Capability unit IIIs–1; if frequently flooded, capability unit Vw–3)

Crowley Series

The soils of the Crowley series consist of dark grayish-brown to brown silt loam over light-gray or light brownish-gray silt loam, silty clay, and silty clay loam mottled with yellowish brown, brownish yellow, yellowish red, and yellow. These soils are poorly drained.

Crowley soils are on the lower part of natural levees bordering stream channels, where they formed in loamy and clayey alluvium. They are adjacent to Forestdale and Sharkey soils. The texture of Crowley soils changes abruptly between the surface layer and the subsoil, whereas texture changes gradually in the upper layers of the Forestdale soils. Crowley soils are less clayey and lighter colored than Sharkey soils.

Typical profile of Crowley silt loam in a cultivated area (SE¼NW¼SW¼ of section 10, T. 14 N., R. 11 E.):

Ap1—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; abundant small roots; mildly alkaline; abrupt, smooth boundary.

Ap2—6 to 10 inches, brown (10YR 5/3) silt loam; common, medium, faint mottles of grayish brown; weak, fine, granular structure; friable; few small roots; few large root holes filled with very dark grayish-brown (10YR 3/2) sandy loam; few fragments of charcoal; moderately alkaline; abrupt, smooth boundary.

A2g—10 to 16 inches, light-gray (10YR 7/1) silt loam; common, fine, distinct mottles of yellowish brown and common, fine, prominent mottles of yellowish red; weak, medium, subangular blocky structure; friable; few small roots and pores; few, fine, black concretions; few large tree root holes filled with very dark grayish-brown (10YR 3/2) sandy loam; mildly alkaline; abrupt, smooth boundary.

B21tg—16 to 29 inches, light brownish-gray (10YR 6/2) silty clay; few, fine, distinct mottles of yellow; moderate, medium, subangular blocky structure; firm; clay films on peds and in pores; few small concretions of calcium carbonate in lower part of horizon; few large tree root holes filled with very dark grayish-brown (10YR 3/2) silt loam; mildly alkaline; clear, wavy boundary.

B22tg—29 to 35 inches, light brownish-gray (10YR 6/2) silty clay loam; common, fine, distinct mottles of yellowish brown; moderate, medium, subangular blocky structure; firm; clay films on peds and in pores; few small roots and pores; common small concretions of calcium carbonate; few, fine, black concretions; few large tree root holes filled with very dark grayish-brown (10YR 3/2) silt loam; moderately alkaline; clear, wavy boundary.

B23tg—35 to 46 inches, light brownish-gray (2.5Y 6/2) silty clay loam; few, fine, distinct mottles of brownish yellow; moderate, medium, subangular blocky structure; few patchy clay films; few small roots and pores; common, small concretions of calcium carbonate; few small tree root holes filled with very dark grayish-brown (10YR 3/2) silt loam; moderately alkaline; clear, wavy boundary.

B3g—46 to 59 inches, light brownish-gray (2.5Y 6/2) silt loam; few, fine, prominent mottles of yellowish red and few, fine, distinct mottles of brownish yellow; massive (structureless) to weak subangular blocky structure; friable; few small roots and pores; moderately alkaline; abrupt, smooth boundary.

Cg—59 to 80 inches, light brownish-gray (2.5Y 6/2) silt loam; few, medium, distinct mottles of dark yellowish brown; massive (structureless); friable; few concretions of calcium carbonate; moderately alkaline.

The Ap1 horizon is dark grayish-brown or dark-brown silt loam. The Ap2 and the A2g horizons together range from 9 to 12 inches in thickness. Reaction throughout is neutral to moderately alkaline.

Crowley silt loam (Cw).—The upper part of the surface layer is dark grayish-brown or dark-brown silt loam about 5 to 8 inches thick. The lower part is brown silt loam about 4 inches thick. The subsurface layer is light-gray silt loam that extends to a depth of about 16 inches. The upper part of the subsoil is light brownish-gray silty clay over silty clay loam and silt loam mottled with grayish brown, yellowish brown, yellowish red, and brownish yellow. The underlying material is light brownish-gray silt loam mottled with dark yellowish brown.

Included with this soil in mapping are a few spots of Sharkey soils. Also included are a few areas of a soil that has a darker surface layer than this soil but otherwise is similar.

Water moves through this soil very slowly. This soil is neutral to moderately alkaline. The available water capacity is high, natural fertility is moderate, and response to additions of fertilizer is good. Some areas respond to lime.

Maintaining tilth is easy on this soil. Farming operations are usually delayed after a rain, unless surface drains are installed. Well-managed drained areas of this soil are well suited to commonly grown crops. (Capability unit IIIw–2)

Dubbs Series

The soils of the Dubbs series consist of pale-brown or brown sandy loam over dark grayish-brown, yellowish-brown, and dark yellowish-brown silt loam and sandy clay loam. Dubbs soils are well drained to moderately well drained.

These soils are generally on the lower part of natural levees bordering stream channels, where they formed in beds of loamy alluvium. Dubbs soils are mapped only in complexes with Dundee and Crevasse soils and with Tiptonville soils. The Dubbs soils are well drained to moderately well drained, whereas the Dundee soils are somewhat poorly drained and the Crevasse soils are excessively drained. Dubbs soils are browner than the Dundee soils. They are more clayey and less friable than Crevasse soils and have a lighter colored surface layer than Tiptonville soils.

Typical profile of a Dubbs sandy loam in a cultivated area (SE¼SE¼SE¼ of section 20, T. 15 N., R. 9 E.):

Ap1—0 to 4 inches, pale-brown (10YR 6/3) sandy loam; weak, medium, granular structure; friable; many small roots; medium acid; abrupt, smooth boundary.

Ap2—4 to 11 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium, angular blocky structure; friable; abundant small roots; medium acid; gradual, smooth boundary.

B21t—11 to 24 inches, yellowish-brown (10YR 5/4) silt loam; moderate, coarse, subangular blocky structure; friable; few, patchy clay films; few small roots; strongly acid; gradual, smooth boundary.

B22t—24 to 40 inches, dark yellowish-brown (10YR 4/4) sandy clay loam; moderate, coarse, subangular blocky structure; firm; clay films on peds and in pores; common small pores; few roots; strongly acid; abrupt, smooth boundary.

IIC—40 to 60 inches, yellowish-brown (10YR 5/8) loamy fine sand; single grain (structureless); loose; few roots; medium acid.

The Ap1 horizon is pale-brown or brown fine sandy loam, silt loam, or sandy loam. The Ap2 horizon is silt loam or sandy loam. The B horizon is yellowish-brown or dark yellowish-brown silty clay loam, silt loam, or sandy clay loam. Depth to the IIC horizon ranges from 36 to 54 inches. Reaction throughout is strongly acid or medium acid.

Dundee Series

The soils of the Dundee series consist of dark grayish-brown or brown silt loam or sandy loam over dark grayish-brown or grayish-brown silty clay loam and silt loam mottled with yellowish brown. Below this is mottled brown, grayish-brown or yellowish-brown, and dark reddish-brown sediments of silt loam to loamy sand. These soils are somewhat poorly drained.

Dundee soils generally occur on the lower part of natural levees, where they formed in beds of loamy alluvium. Most areas are adjacent to the excessively drained Crevasse, the well drained to moderately well drained Dubbs, and the poorly drained Amagon soils. Dundee soils are finer textured and less friable than Crevasse soils and are less gray and better drained than Amagon soils. They are grayer than the Dubbs soils.

Typical profile of Dundee silt loam in a cultivated field (SE¼NE¼SW¼ of section 9, T. 10 N., R. 9 E.):

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; few small roots and pores; medium acid; abrupt, smooth boundary.

B21t—7 to 13 inches, dark grayish-brown (10YR 4/2) silty clay loam; few, medium, faint mottles of yellowish brown; moderate, medium, subangular blocky structure; friable; few patchy clay films on most peds; few small roots and pores; strongly acid; clear, wavy boundary.

B22t—13 to 31 inches, dark grayish-brown (10YR 4/2) silty clay loam; common, medium, faint mottles of dark yellowish brown and few, medium, prominent mottles of yellowish red; moderate, medium, subangular blocky structure; firm; continuous clay films on most peds; few small roots; rootholes and wormholes lined with very dark grayish brown (10YR 3/2); few small pores; few, small, brown and black concretions; strongly acid; gradual, wavy boundary.

B3—31 to 38 inches, grayish-brown (10YR 5/2) silt loam; many, medium, prominent mottles of dark reddish brown and few, medium, faint mottles of dark yellowish brown; weak, medium, subangular blocky structure; friable; few small roots and pores; few, small, brown and black concretions; very strongly acid; gradual, wavy boundary.

C1—38 to 52 inches, mottled brown (10YR 4/3), grayish-brown (10YR 5/2), and yellowish-brown (10YR 5/6) fine sandy loam; massive (structureless); friable; few small roots and pores; few brown and black concretions; strongly acid; gradual, wavy boundary.

C2—52 to 80 inches, light brownish-gray (10YR 6/2) fine sandy loam; common, medium, distinct mottles of brown and few, medium, distinct mottles of light gray and yellowish brown; massive (structureless); friable; medium acid.

The Ap horizon is dark grayish-brown or brown silt loam or sandy loam. The B horizon consists of silty clay loam and silt loam 25 to 35 inches thick. The C horizon ranges from silt loam to loamy sand. Depth to mottling ranges from 7 to 13 inches. Reaction throughout is very strongly acid to medium acid.

Dundee silt loam (Du).—This soil has a dark grayish-brown or brown silt loam surface layer about 7 inches thick. The subsoil extends to a depth of 38 inches and consists of dark grayish-brown and grayish-brown silty clay loam and silt loam mottled with yellowish brown. Below this are mottled brown, grayish-brown, and yellowish-brown sediments that range from silt loam to loamy sand. Depth to mottles ranges from 7 to 13 inches. Some areas of this soil are frequently flooded.

Included with this soil in mapping are a few spots of sandy loam and silty clay loam and undulating areas in which narrow depressions alternate with low rises.

Water moves through this soil at a moderately slow rate. In places a plowsole that formed beneath the plow depth restricts the penetration of roots and the movement of water. This soil is medium acid to very strongly acid. The available water capacity and natural fertility are high, and response to additions of fertilizer and lime is good. Tilth is easy to maintain.

Where this soil is not frequently flooded, it is well suited to commonly grown cultivated crops. (Capability unit I-1; if frequently flooded, capability unit Vw-2)

Dundee-Dubbs-Crevasse complex (Dv).—This soil complex is mainly in the western part of the county. It consists of somewhat poorly drained to excessively drained soils. Some areas are frequently flooded. These soils are mapped together because they are so intermingled that it is not practical to separate them on the soil map. The complex is about 50 percent Dundee soils, 25 percent Dubbs soils, and 20 percent Crevasse soils. The rest is inclusions of Amagon soils.

The Crevasse soils occur as blows or patches of sand. The sand is extrusions blown from fissures opened in 1811 during the New Madrid earthquake (*6*). Normally the sand blow is nearly circular, 8 to 15 feet across, and 3 to 6 inches high. Some blows are as much as 100 feet wide and 600 feet or more long. Dundee and Dubbs soils occupy the areas between the blows and patches of sand.

The Dundee and Crevasse soils have profiles similar to the ones described as typical for their series. The Dubbs soils have a surface layer of pale-brown and dark grayish-brown sandy loam and silt loam about 11 inches thick. The upper 13 inches of the subsoil consists of yellowish-brown silt loam. The lower part is dark yellowish-brown sandy clay loam. The underlying material is yellowish-brown loamy fine sand.

Water moves through the Dundee soils at a moderately slow rate and through the Dubbs soils at a moderate rate. Water moves rapidly through the Crevasse soils. In places a plowsole that formed beneath plow depth in the Dundee and Dubbs soils restricts the penetration of roots and the movement of water.

Dundee and Dubbs soils have high available water capacity and respond well to additions of lime and fertilizer. Crevasse soils have low available water capacity and respond only moderately well to additions of lime and fertilizer. Crevasse soils are medium acid to mildly alkaline, whereas Dundee and Dubbs soils are medium acid to strongly acid. Natural fertility is high in the Dundee and Dubbs soils, but it is low in the Crevasse soils.

Maintaining tilth is easy on these soils. Because the Crevasse soils warm early in spring, crops can be planted early. Crops wilt during short periods of drought. Strong winds blow in spring, and loss of silt, clay, and organic matter by soil blowing is a severe hazard. If well managed and protected from flooding, the Dundee and Dubbs soils are well suited to the commonly grown crops and the Crevasse soils are fairly well suited. (Dundee and Dubbs soils are in capability unit I–1; Crevasse soils are in capability unit IIIs–1; if frequently flooded, all soils are in capability unit Vw–2)

Earle Series

The soils of the Earle series consist of very dark gray, very dark grayish-brown, or dark-brown clay over light brownish-gray or gray silty clay mottled with yellowish red and strong brown. Below this, at a depth of 20 to 36 inches, is grayish-brown silt loam mottled with dark yellowish brown or strong brown. Earle soils are somewhat poorly drained.

Earle soils are at the higher elevations, where they formed in beds of clayey sediments deposited by slack water and underlain by loamy sediments. The loamy deposits are underlain by coarser textured sediments. Earle soils are adjacent to Alligator soils but are better drained and have a less clayey substratum.

Typical profile of Earle clay in a cultivated field (SE¼SE¼SE¼ of section 20, T. 10 N., R. 8 E.):

Ap—0 to 5 inches, dark-brown (10YR 3/3) clay; weak, medium, granular structure; hard, firm, plastic; many small roots; few, fine, black concretions; very strongly acid; clear, smooth boundary.

B2—5 to 34 inches, light brownish-gray (10YR 6/2) silty clay with common, fine, prominent mottles of yellowish red and strong brown; moderate, medium, subangular blocky structure; hard, firm, plastic; abundant small pores; few, fine, black concretions; few small roots; very strongly acid; gradual, smooth boundary.

IIB3g—34 to 55 inches, grayish-brown (2.5Y 5/2) silt loam; common, fine, distinct mottles of dark yellowish brown and strong brown; weak, fine, subangular blocky structure; friable to firm; few small pores; few to common, fine, black concretions; few small roots; very strongly acid; abrupt, smooth boundary.

IICg—55 to 76 inches, dark-gray (10YR 4/1) silty clay; common, fine, distinct mottles of dark yellowish brown; massive (structureless); hard, firm, plastic; abundant small pores; few black concretions; few small roots; moderately alkaline.

The Ap horizon is very dark gray, very dark grayish-brown, or dark-brown clay. The B2 horizon is light brownish-gray or gray clay or silty clay mottled with yellowish red and strong brown. The IIB3g horizon is grayish-brown silt loam, loam, sandy clay loam, silty clay loam, or sandy loam mottled with yellowish brown and strong brown. The upper 20 to 36 inches of Earle soils is clayey, and the lower part is loamy. In some places the IIC horizon is loamy. Reaction throughout the solum is very strongly acid or strongly acid.

Earle clay (Ec).—The surface layer of this soil is very dark gray, very dark grayish-brown, or dark-brown clay 4 to 8 inches thick. The upper part of the subsoil is light brownish-gray or gray silty clay or clay mottled with strong brown and yellowish red. Coarser textured sediments occur at a depth of 20 to 36 inches.

Included with this soil in mapping are a few areas of Alligator soils and small areas of a soil that has a silty clay surface layer.

Earle clay contracts and cracks as it dries. When it gets wet, it expands and the cracks seal. Water moves through the soil very slowly except when it is cracked; then water enters very rapidly until the cracks seal. Natural fertility is high, and response to additions of fertilizer and lime is good. The available water capacity is high. The surface layer and subsoil of this soil are very strongly acid or strongly acid.

Preparing a seedbed and maintaining tilth are difficult because of the kind and the high content of clay in the soil. This soil can be cultivated within only a narrow range of moisture content. Farming operations are commonly delayed after a rain unless surface drains are installed. Well-drained areas are well suited to commonly grown crops. (Capability unit IIw–1)

Forestdale Series

The soils of the Forestdale series consist of dark grayish-brown silt loam or silty clay loam over dark-gray, gray, or light brownish-gray silty clay or silty clay loam mottled with yellowish brown, dark brown, or strong brown. Below this is gray, light-gray, and light brownish-gray silt loam to sandy loam mottled with shades of brown and yellow. These soils are poorly drained.

Forestdale soils are on the lower part of natural levees bordering stream channels, where they formed in stratified loamy and clayey alluvium. They are adjacent to the poorly drained Amagon soils and the somewhat poorly drained Dundee soils. Forestdale soils are more clayey in the upper part of the subsoil than both soils and are more poorly drained than the Dundee soils.

Typical profile of Forestdale silt loam in a cultivated field (SW¼SE¼NE¼ of section 30, T. 12 N., R. 8 E.):

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium, granular structure; friable; abundant small roots and pores; medium acid; abrupt, smooth boundary.

B21tg—6 to 12 inches, dark-gray (10YR 4/1) silty clay loam; few, fine, faint mottles of dark brown and yellowish brown; weak, medium, subangular blocky structure; firm; few patchy clay films on some peds and in pores; abundant small roots and pores; strongly acid; clear, wavy boundary.

B22tg—12 to 26 inches, dark-gray (10YR 4/1) silty clay; common, fine, distinct mottles of dark brown and few, fine, distinct mottles of strong brown and faint gray; moderate, fine to medium, subangular blocky structure; firm; clay films on most peds; few small roots and pores; few, small, dark concretions; strongly acid; clear, wavy boundary.

IIB3g—26 to 42 inches, gray (10YR 5/1) sandy loam; common, medium, prominent mottles of dark reddish brown; common, medium, faint mottles of gray and few, medium, prominent mottles of dark reddish brown; weak, medium, subangular blocky structure; friable; few, small, dark concretions; sand grains coated and bridged with clay; strongly acid; clear, wavy boundary.

IIC1g—42 to 52 inches, light-gray (10YR 6/1) sandy loam; few, coarse, prominent mottles of dark reddish brown and few, medium, prominent mottles of dark red; massive (structureless); friable; few, dark concretions; medium acid; clear, wavy boundary.

IIC2g—52 to 72 inches, light brownish-gray (10YR 6/2) silt loam or light silty clay loam; common, medium, prominent mottles of yellowish red and dark brown; massive (structureless); firm; abundant, medium, dark concretions; medium acid.

The Ap horizon is silt loam or silty clay loam. The B21tg and B22tg horizons are dark gray to light gray. The IIB3g horizon is gray silt loam or sandy loam. The IIC horizon ranges from light-gray or light brownish-gray silty clay loam to sandy loam. Reaction throughout ranges from very strongly acid to medium acid.

Forestdale silt loam (Fe).—This soil has a dark grayish-brown silt loam surface layer 4 to 8 inches thick. The upper part of the subsoil is dark-gray, gray, or light brownish-gray silty clay and silty clay loam mottled with yellowish brown, dark brown, or strong brown. It extends to a depth of about 26 inches. The lower part of the subsoil is gray sandy loam that extends to a depth of about 42 inches. The underlying material is light-gray and light brownish-gray silty clay loam to sandy loam mottled with shades of brown and yellow.

Included with this soil in mapping are a few areas of Amagon and Dundee soils. Also included are undulating areas in which narrow depressions alternate with low rises and a few areas of a soil that is similar to this Forestdale soil but has a darker surface layer.

Water moves through this soil very slowly. In places a plowsole that formed beneath plow depth restricts the penetration of roots and the movement of water. The available water capacity is high and natural fertility is moderate. Response to additions of lime and fertilizer is good. This soil is very strongly acid to medium acid.

Tilth is easy to maintain. Farming operations are commonly delayed after a rain unless surface drains are installed. Well-managed, drained areas of this soil are suited to most crops commonly grown. (Capability unit IIIw–2)

Forestdale silty clay loam (Fo).—This soil has a dark grayish-brown silty clay loam surface layer 4 to 8 inches thick. The upper part of the subsoil is dark-gray, gray, or light brownish-gray silty clay and silty clay loam mottled with yellowish brown, dark brown, or strong brown. The lower part of the subsoil is gray sandy loam to a depth of about 42 inches. Below this is light-gray and light brownish-gray silty clay loam to sandy loam mottled with shades of brown and yellow.

Included with this soil in mapping are a few spots of Amagon and Dundee soils. Also included are a few areas of a soil that has a darker surface layer than this soil but otherwise is similar.

Water moves very slowly through this soil. The available water capacity is high and natural fertility is moderate. Response to additions of lime and fertilizer is good. This soil is very strongly acid to medium acid.

Maintaining tilth is somewhat difficult. Farming operations are commonly delayed after a rain unless surface drains are used. Well-managed, drained areas of this soil are suited to commonly grown crops. (Capability unit IIIw–2)

Forestdale-Routon complex (Fr).—This complex of poorly drained soils occurs mainly in the western part of the county. The soils are so intermingled that it is not practical to separate them on the soil map.

The complex is 50 percent Forestdale soils and 40 percent Routon soils. The remaining 10 percent is included Crevasse and Steele soils. The Forestdale and Routon soils have profiles similar to the ones described as typical for their series.

Water moves through the Forestdale soils at a very slow rate and through the Routon soils at a slow rate. In places a plowsole that formed beneath the plow depth restricts the penetration of roots and the movement of water. The available water capacity is high and natural fertility is moderate to high. Crop response to additions of fertilizer and lime is good. The Forestdale soils are very strongly acid to medium acid. The Routon soils are medium acid to neutral.

Tilth is easy to maintain. Farming operations are commonly delayed after a rain unless surface drains are installed, Drained, well-managed areas are suited to most commonly grown crops. (Capability unit IIIw–2)

Hayti Series

The soils of the Hayti series consist of very dark grayish-brown fine sandy loam over silt loam, loam, and sandy clay loam mottled with shades of brown and red. These soils are poorly drained.

Hayti soils are on the lower part of natural levees that border stream channels, where they formed in loamy alluvium. They are adjacent to Commerce and Convent soils. Hayti soils are grayer and more poorly drained than Commerce and Convent soils.

Typical profile of Hayti fine sandy loam in a cultivated area (SE¼SE¼NW¼ of section 28, T. 14 N., R. 8 E.):

Ap1—0 to 6 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, medium, granular structure; friable; abundant roots; slightly acid; abrupt, smooth boundary.

Ap2—6 to 10 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, medium, subangular blocky structure; friable; abundant small roots; common small pores and wormholes; slightly acid; abrupt, smooth boundary.

B21g—10 to 16 inches, gray (10YR 6/1) silt loam; common, fine, distinct mottles of reddish brown and common, fine, distinct mottles of dark brown; weak, medium, subangular blocky structure; friable; few small roots and pores; few, small, brown and black concretions; neutral; clear, wavy boundary.

B22g—16 to 24 inches, gray (10YR 6/1) loam; common, fine, prominent mottles of reddish brown and yellowish red; weak, medium, subangular blocky structure; friable; few small roots; common small pores; few small brown and black concretions; neutral; clear, wavy boundary.

B23g—24 to 44 inches, grayish-brown (2.5Y 5/2) loam; common, fine, prominent mottles of dark red and yellowish brown; weak, medium, subangular blocky structure; friable; common small pores; few, small, brown and black concretions; mildly alkaline; clear, wavy boundary.

B24g—44 to 52 inches, gray (10YR 5/1) sandy clay loam; few, fine, prominent mottles of dark reddish brown; weak, medium, subangular blocky structure; friable; few small pores; moderately alkaline; abrupt, smooth boundary.

C1g—52 to 67 inches, gray (10YR 6/1) sandy clay loam; common, medium, distinct mottles of yellowish brown and common, medium, prominent mottles of dark red; massive (structureless); friable; few small pores; moderately alkaline; abrupt, smooth boundary.

C2g—67 to 80 inches. gray (10YR 6/1) sandy loam; common, medium, distinct mottles of yellowish brown and common, fine, prominent mottles of yellowish red; massive (structureless); friable, moderately alkaline.

The B horizon is loam to silty clay loam above a depth of 44 inches. Reaction throughout ranges from slightly acid to moderately alkaline.

Hayti fine sandy loam (Ha).—This soil has a very dark grayish-brown fine sandy loam surface layer 5 to 10 inches thick. The subsoil extends to a depth of about 52 inches and consists of gray and grayish-brown silt loam or silty clay loam, loam, and sandy clay loam mottled with brown and red. Below this is gray sandy clay loam and sandy loam. Some areas are frequently flooded.

Small spots of Commerce and Convent soils and a few small areas where the surface layer is silt loam and loam are included in mapping.

Water moves through this soil at a slow rate. In places a plowsole that formed beneath plow depth restricts the penetration of roots and the movement of water. The available water capacity and natural fertility are high, and response to additions of fertilizer is good. This soil is slightly acid to moderately alkaline.

Tilth is easy to maintain. Farming operations are commonly delayed for a few days after a rain unless surface drains are installed. If this soil is well managed, adequately drained, and protected from flooding, it is suited to commonly grown crops. (Capability unit IIIw-2; if frequently flooded, capability unit Vw-2)

Iberia Series

The soils of the Iberia series consist of black and very dark gray clayey material over gray clayey material and gray to light olive-gray loamy material mottled with shades of red and brown. These soils are poorly drained.

Iberia soils are on broad flats bordering stream channels. These soils formed in thick beds of clayey sediments deposited by slack water. Iberia soils are adjacent to Sharkey soils. They have thicker, darker surface layers than Sharkey soils.

Typical profile of Iberia clay in a cultivated area (NW¼SE¼SW¼ of section 34, T. 16 N., R. 8 E.):

Ap—0 to 4 inches, black (10YR 2/1) clay; weak, medium, subangular blocky structure; firm; slightly acid; abrupt, smooth boundary.

A1—4 to 20 inches, black (10YR 2/1) clay; few, fine, distinct mottles of dark brown; moderate, fine, angular blocky structure; firm, very plastic; few small and large roots; few small pores; few slickensides that do not intersect; few small pockets of concretions of calcium carbonate; neutral; clear, wavy boundary.

B21g—20 to 29 inches, very dark gray (10YR 3/1) clay; common, fine, distinct mottles of yellowish red; moderate, fine, angular blocky structure; firm, very plastic; few small and large roots; few small pores; few slickensides that do not intersect; few small concretions of calcium carbonate; neutral; clear, wavy boundary.

B22g—29 to 38 inches, black (10YR 2/1) clay; few, fine, distinct mottles of yellowish brown; moderate, fine, angular blocky structure; firm, very plastic; few small and large roots; very small pores; few cracks filled with gray (5Y 5/1) clay; few slickensides that do not intersect; neutral; clear, wavy boundary.

B3g—38 to 47 inches, gray (5Y 5/1) silty clay; few, fine, prominent mottles of strong brown; weak, medium, angular blocky structure; firm, very plastic; few large roots; few pores; few slickensides that do not intersect; few cracks filled with black (10YR 2/1) clay; mildly alkaline; abrupt, smooth boundary.

IIC1g—47 to 54 inches, gray (5Y 5/1) silt loam; few, medium, distinct mottles of yellowish brown; massive (structureless); friable; few large roots; few small pores; mildly alkaline; abrupt, smooth boundary.

IIC2g—54 to 68 inches, light olive-gray (5Y 6/2) silty clay loam; few, medium, prominent mottles of red and few, fine, prominent mottles of yellowish brown; massive (structureless); friable; few pockets of sand; mildly alkaline; abrupt, smooth boundary.

IIC3g—68 to 75 inches, variegated colors of brown, yellow, and gray fine sandy loam; massive (structureless); mildly alkaline.

The Ap horizon is black, very dark gray, or very dark brown. Depth to the C1g horizon ranges from 35 to 50 inches. The C horizon ranges from gray to light olive gray mottled with shades of red and brown. In some places layers of silt loam, silty clay loam, and sandy loam begin at a depth of about 40 inches. Reaction throughout ranges from slightly acid to mildly alkaline.

Iberia clay (Ib).—The surface layer of this soil is black to very dark brown clay 4 to 6 inches thick over about 16 inches of black clay. The subsoil, which extends to a depth of about 47 inches, is black, very dark gray, and gray clay mottled with dark brown, yellowish red, and yellowish brown. Below this is gray and light olive-gray silty clay to fine sandy loam. A few spots of Sharkey soils are included in mapping.

This soil contracts and cracks as it dries. When it gets wet, it expands, and the cracks seal. Water moves very slowly through this soil except when it is cracked; then water enters very rapidly until the cracks seal. The available water capacity is high. Natural fertility is moderate to high. The response to additions of fertilizer is good. Some areas respond to lime. This soil is slightly acid to mildly alkaline.

Maintaining tilth and preparing a seedbed are difficult because of the high content and the kind of clay in this soil. This soil can be cultivated within only a narrow range of moisture content. Farming operations are commonly delayed after a rain unless surface drains are installed. Where drained, this soil is suited to most common crops. (Capability unit IIIw-1)

Jeanerette Series

Soils of the Jeanerette series consist of very dark grayish-brown silt loam overlying very dark gray, dark-gray, and gray silty clay loam or loam mottled with dark yellowish brown and yellowish brown. These soils are somewhat poorly drained.

Jeanerette soils are on level parts of low natural levees where they formed in loamy sediments. These soils are adjacent to Sharkey and Tunica soils. Jeanerette soils are coarser textured and are darker colored below the surface layer than Sharkey and Tunica soils.

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Typical profile of Jeanerette silt loam in a cultivated area (SW¼SE¼SE¼ of section 18, T. 11 N., R. 10 E.):

Ap—0 to 9 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable; abundant small roots; slightly acid; abrupt, smooth boundary.

B21tg—9 to 26 inches, very dark gray (10YR 3/1) silty clay loam; common, fine, distinct mottles of dark yellowish brown; moderate, medium, subangular blocky structure; firm; clay films on almost all peds; abundant small roots and pores; few, small, black concretions; slightly acid; clear, wavy boundary.

B22tg—26 to 36 inches, dark-gray (10YR 4/1) silty clay loam; common, fine, distinct mottles of yellowish brown; moderate, medium, subangular blocky structure; firm; patchy clay films; few small roots and pores; few, small, black concretions; slightly acid; clear, wavy boundary.

B3g—36 to 42 inches, gray (10YR 5/1) loam; common, fine, distinct mottles of yellowish brown; moderate, medium, subangular blocky structure; firm; abundant small pores; few patchy clay films on peds; few small roots; few, small, black concretions; neutral; clear, wavy boundary.

IIC1g—42 to 60 inches, gray (10YR 5/1) fine sandy loam; common, fine, distinct mottles of dark yellowish brown; massive (structureless); friable; abundant small pores; mildly alkaline; clear, smooth boundary.

IIIC2g—60 to 72 inches, dark-gray (10YR 4/1) silty clay; common, medium, distinct mottles of dark yellowish brown; massive (structureless); firm; mildly alkaline.

The Ap horizon is very dark grayish brown or dark brown. The B22tg horizon is dark gray or very dark gray. In places there are numerous bog-iron concretions ¼ inch to 2 inches in diameter. Reaction throughout ranges from slightly acid to mildly alkaline.

Jeanerette silt loam (Je).—This soil has a very dark grayish-brown or dark-brown silt loam surface layer 6 to 10 inches thick. The subsoil is very dark gray, dark-gray, and gray silty clay loam and loam mottled with dark yellowish brown and yellowish brown. It extends to a depth of about 42 inches. The underlying material is gray fine sandy loam and dark-gray silty clay. Some areas are frequently flooded.

Included with this soil in mapping are spots of Sharkey and Tunica soils. Also included are small areas of soils having a surface layer of clay loam, sandy clay, or loam.

Water moves through this soil at a moderately slow rate. This soil is slightly acid to mildly alkaline, has high available water capacity and natural fertility, and responds well to additions of fertilizer.

Tilth is easy to maintain. Farming operations are commonly delayed after a rain unless surface drains are installed. If adequately drained and protected from flooding, this soil is well suited to common crops. (Capability unit IIw–2; if frequently flooded, capability unit Vw–2)

Morganfield Series

The soils of the Morganfield series consist of dark grayish-brown or brown fine sandy loam over very dark grayish-brown, brown, and very pale brown silt loam and very fine sandy loam. These soils are well drained.

The Morganfield soils are on natural levees bordering stream channels, where they formed in loamy alluvium. Morganfield soils are adjacent to Commerce and Bruno soils. They are darker brown than Commerce soils and finer textured than Bruno soils.

Typical profile of Morganfield fine sandy loam in a cultivated area (NW¼SE¼SE¼ of section 12, T. 11 N., R. 11 E.):

Ap—0 to 7 inches, brown (10YR 4/3) fine sandy loam; weak, medium, granular structure; very friable; abundant fine pores and fine roots; mildly alkaline; abrupt, wavy boundary.

A1—7 to 11 inches, dark grayish-brown (10YR 4/2) silt loam; massive (structureless) that breaks to medium platy and angular blocky; compact and friable; abundant fine roots and fine pores; mildly alkaline; abrupt, smooth boundary.

C1—11 to 32 inches, brown (10YR 5/3) silt loam; massive (structureless); very friable; abundant fine pores and roots; common bedding planes; few root channels filled with brown (10YR 4/3) loam; mildly alkaline; gradual, wavy boundary.

C2—32 to 62 inches, pale-brown (10YR 6/3) very fine sandy loam; few, fine, faint mottles of yellowish brown in lower part; massive (structureless); very friable; abundant fine pores; few fine roots; many bedding planes; mildly alkaline; clear, wavy boundary.

C3—62 to 82 inches, very pale brown (10YR 7/3) very fine sandy loam; common, fine, faint mottles of yellowish brown and dark yellowish brown; massive (structureless); very friable; light-gray (10YR 7/1) silt loam in thin bands 2 inches or less thick; moderately alkaline.

The Ap horizon is dark grayish brown or brown. The C horizon is brown, pale-brown, or very pale brown silt loam, loam, or very fine sandy loam. Reaction throughout the upper 5 feet of the profile ranges from slightly acid to mildly alkaline.

Morganfield fine sandy loam (Mo).—The upper part of the surface layer of this soil is dark grayish-brown or brown fine sandy loam 5 to 8 inches thick. The lower part is dark grayish-brown silt loam about 4 inches thick. Below this is brown, pale-brown, and very pale brown silt loam and very fine sandy loam. Some areas are frequently flooded.

Included with this soil in mapping are a few spots of Bruno and Commerce soils. Also included are small areas of soils having silt loam and silty clay loam surface layers and undulating areas in which narrow depressions alternate with low rises.

Water moves through this soil at a moderate rate. In places a plowsole that formed beneath plow depth restricts the penetration of roots and the movement of water. The available water capacity and natural fertility are moderate to high, and response to additions of fertilizer is good. This soil is slightly acid to mildly alkaline. Tilth is easy to maintain.

Where this soil is not frequently flooded, it is well suited to most commonly grown crops. (Capability unit I–1; if frequently flooded, capability unit Vw–2)

Routon Series

The soils of the Routon series consist of dark grayish-brown sandy loam over gray sandy loam and grayish-brown silt loam and silty clay loam mottled with yellowish brown, grayish brown, and yellowish red. These soils are poorly drained. Routon soils are mapped only in complexes with the Crevasse, Dundee, and Forestdale soils.

The Routon soils are on the middle and lower parts of natural levees that border stream channels, where they developed in loamy alluvium. These soils are finer textured throughout than the Crevasse soils and are more poorly drained than the Dundee soils. The Routon soils are less clayey in the upper part of the subsoil than the Forestdale soils.

Typical profile of Routon sandy loam (SE¼SE¼SW¼ of section 32, T. 14 N., R. 8 E.):

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

A2g—6 to 13 inches, gray (10YR 5/1) sandy loam; weak, medium, granular structure; friable; abundant small roots; slightly acid; clear, smooth boundary.

B21tg—13 to 19 inches, gray (10YR 5/1) silt loam; few, fine, distinct mottles of yellowish brown; weak, medium, subangular blocky structure; friable; patchy clay films; slightly acid; clear, wavy boundary.

B22tg—19 to 38 inches, mottled grayish-brown (10YR 5/2) and yellowish-red (5YR 5/8) silty clay loam; moderate, medium, subangular blocky structure; firm; patchy clay films; few small roots; few black concretions; slightly acid; gradual, wavy boundary.

B3g—38 to 48 inches, mottled grayish-brown (10YR 5/2) and yellowish-red (5YR 5/8) silt loam; weak, coarse, subangular blocky structure; firm; few patchy clay films; few small roots; few black concretions; slightly acid.

The Ap horizon is brown or dark grayish brown. The B21tg horizon is silt loam or silty clay loam. The B22tg and B3g horizons are silty clay loam or silt loam. Reaction throughout ranges from medium acid to neutral.

Routon-Dundee-Crevasse complex (Rd).—This soil complex is mainly in the western part of the county. It consists of poorly drained to excessively drained soils. The soils are so intermingled that it is not practical to separate them on the soil map. Some areas of this complex are frequently flooded.

The complex is about 35 percent Routon soils, 30 percent Dundee soils, and 25 percent Crevasse soils. The rest is included Dubbs and Bruno soils.

The Crevasse soils occur as patches or low mounds of sand. The patches formed after extrusions of sand were blown from fissures opened during the New Madrid earthquake in 1811 (*6*). Normally the patches are nearly circular, 8 to 15 feet across, and 3 to 6 inches high. Some are as much as 100 feet wide and 600 feet or more long. The Routon and Dundee soils occupy areas around the sand blows. The Dundee and Crevasse soils in this complex have profiles similar to the ones described as typical for their series.

The Routon soils have a surface layer of dark grayish-brown sandy loam about 6 inches thick. The subsurface layer is gray sandy loam about 7 inches thick. The upper part of the subsoil is gray silt loam, the middle is mottled grayish-brown and yellowish-red silty clay loam, and the lower part is mottled grayish-brown and yellowish-red silt loam.

Water moves through the Routon and Dundee soils at a slow to moderately slow rate; water moves rapidly through the Crevasse soils. A plowsole that formed beneath plow depth in the Routon and Dundee soils restricts the penetration of roots and the movement of water. The Routon soils are medium acid to neutral; the Dundee soils are medium acid to very strongly acid; and the Crevasse soils are medium acid to mildly alkaline. Available water capacity is high in the Routon and Dundee soils and low in the Crevasse soils. Crops on Routon and Dundee soils respond well to additions of lime and fertilizer, and those on Crevasse soils respond only moderately well.

Maintaining tilth is easy on these soils. Natural fertility is high in the Routon and Dundee soils and is low in the Crevasse. Farming operations are commonly delayed after a rain unless surface drains are installed.

The Crevasse soils warm early in spring and can be seeded early. Crops wilt during short periods of drought, and soil blowing is a severe hazard in spring. If well managed and protected from flooding, Crevasse soils are fairly well suited to common cool-season crops. If well managed, drained, and protected from flooding, the Routon and Dundee soils are well suited to common crops. (Routon and Dundee soils are in capability unit IIw–2; Crevasse soils are in capability unit IIIs–1; all soils are in capability unit Vw–2 if frequently flooded)

Sharkey Series

The Sharkey series consists of very dark grayish-brown or dark grayish-brown silty clay or silty clay loam over dark-gray clay mottled with dark brown and dark yellowish brown. These soils are poorly drained.

Sharkey soils are on broad flats, where they developed in thick beds of clayey sediments deposited by slack water. They are adjacent to Tunica soils but developed in thicker beds of clay.

Profile of Sharkey silty clay in a cultivated area (SW¼SW¼SW¼ of section 12, T. 11 N., R. 10 E.):

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, fine, subangular blocky structure; firm, plastic; abundant small pores and roots; slightly acid; clear, smooth boundary.

B21g—6 to 34 inches, dark-gray (10YR 4/1) clay; common, fine, distinct mottles of dark brown; moderate, fine to medium, angular and subangular blocky structure; firm, plastic; abundant small pores and roots; common slickensides that do not intersect; neutral; gradual, smooth boundary.

B22g—34 to 72 inches, dark-gray (10YR 4/1) clay; few, fine, distinct mottles of dark yellowish brown; strong, medium, angular blocky structure; firm, plastic; abundant small roots; few pockets of dark-gray (10YR 4/1) silty clay loam 6 to 8 inches in diameter; common slickensides that do not intersect; moderately alkaline.

The A horizon is very dark grayish-brown or dark grayish-brown silty clay or silty clay loam. The B horizon is dark gray or gray. Reaction ranges from slightly acid to moderately alkaline.

Sharkey silty clay loam (Sc).—This poorly drained soil has a very dark grayish-brown or dark grayish-brown silty clay loam surface layer 4 to 8 inches thick. The subsoil is dark-gray or gray clay mottled with dark brown or dark yellowish brown.

A few spots of Tunica soils and of undulating areas consisting of alternating narrow depressions and low rises are included with this soil in mapping.

This soil contracts and cracks when it dries. When it gets wet, it expands and the cracks seal. Water moves through this soil very slowly except when it is cracked; then water enters rapidly until the cracks seal. The available water capacity is high. Natural fertility is moderate to high, and response to additions of fertilizer is good. This soil is slightly acid to moderately alkaline.

Tilth is difficult to maintain. Because of the high content of clay and the kind of clay, preparing a seedbed also is fairly difficult. This soil can be cultivated within only a narrow range of moisture content. Farming operations are commonly delayed after a rain unless surface drains are provided. Some areas are subject to frequent flooding. With drainage, protection from flooding, and good management, this soil is fairly well suited to most commonly grown crops. (Capability unit IIIw–1; if frequently flooded, capability unit Vw–1)

Sharkey silty clay (Sh).—This poorly drained soil has a very dark grayish-brown or dark grayish-brown silty clay surface layer 4 to 8 inches thick. The subsoil is dark-gray or gray clay mottled with dark brown and dark yellowish brown.

Included with this soil in mapping are a few spots of Tunica soils. Also included are a few small areas of soils that have a clay loam or silty clay loam surface layer. Other included areas are undulating and consist of narrow depressions alternating with low rises.

Sharkey silty clay contracts and cracks when it dries. When it gets wet it expands, and the cracks seal. Water moves through this soil very slowly except when it is cracked; then water enters very rapidly until the cracks seal. The available water capacity is high. Natural fertility is moderate to high, and response to additions of fertilizer is good. This soil is slightly acid to moderately alkaline.

Tilth is difficult to maintain. Because of the high content of clay and the kind of clay, preparing a seedbed also is difficult (fig. 4). This soil can be cultivated within only a narrow range of moisture content. Farming operations are commonly delayed after a rain. Some areas are subject to frequent flooding. With drainage, good management, and protection from flooding, this soil is fairly well suited to most commonly grown crops. (Capability unit IIIw–1; if frequently flooded, capability unit Vw–1).

***Figure 4.*—Sharkey silty clay prepared during fall so that a good seedbed can be obtained before planting in spring. During winter, the plow layer swells when wet and shrinks as it dries. This makes the clods crumble and helps to make a good seedbed.**

Sharkey-Crevasse complex (Sk).—This soil complex consists of poorly drained Sharkey soils and excessively drained Crevasse soils. These soils are mainly in the western part of the county. They are mapped together because they are intermingled in such an intricate pattern that it is not practical to map them separately at the scale of the soil map. Some areas are subject to frequent flooding.

Sharkey soils make up about 50 percent of this complex, and Crevasse soils 30 percent. The remaining 20 percent is made up of included Steele and Tunica soils. Other areas included in mapping are undulating and consist of narrow depressions alternating with low rises.

The Crevasse soils occur as patches of sand, or low mounds, that dot the dark surface of this complex. Sharkey soils are between these patches, locally called sand blows. The patches are the result of extrusions of sand that were blown from fissures opened by shock during the New Madrid earthquake in 1811 (*6*). Normally, the blow is a nearly circular patch of sand that is 8 to 15 feet across and 3 to 6 inches high, though some of the blows are as much as 100 feet wide and 600 feet or more long. These sand blows stand out strongly against the intermingled areas of darker soil. The Sharkey and the Crevasse soils in this complex have profiles similar to the ones described as typical for their series.

The Sharkey soils contract and crack when they dry, and they expand and the cracks seal when they are wet. Water moves very slowly through these soils except when they are cracked; then water enters very rapidly until the cracks seal. The available water capacity is high. Natural fertility is moderate to high, and response to additions of fertilizer is good. Sharkey soils are slightly acid to moderately alkaline.

Tilth is difficult to maintain on the Sharkey soils. Because of the high content and the kind of clay, preparing a seedbed also is difficult. The Sharkey soils can be cultivated within only a narrow range of moisture content. After a rain, farming operations commonly are delayed unless surface drains are provided. The frequently flooded areas are poorly suited to farming, but with drainage and protection from flooding, these soils are fairly well suited to the commonly grown crops.

Water moves through the Crevasse soils rapidly. These soils are medium acid to mildly alkaline. The available water capacity is low, and droughtiness limits use of these soils for crops. Natural fertility is low, and response to additions of fertilizer is moderate.

Tilth is easy to maintain on the Crevasse soils. These soils can be planted early in spring because they warm early. Crops, however, wilt during short periods of drought. With good management and protection from flooding, these soils are fairly well suited to commonly grown crops. (Sharkey soils are in capability unit IIIw–1; Crevasse soils are in capability unit IIIs–1; both soils are in capability unit Vw–1 if frequently flooded)

Sharkey-Steele complex (Sm).—This soil complex consists of poorly drained Sharkey soils and moderately well drained Steele soils. These soils are mainly in the central and western parts of the county. The soils are mapped together because they are intermingled in such an intricate pattern that it is not practical to map them separately at the scale of the soil map. Some areas are subject to frequent flooding.

The Sharkey soils make up about 70 percent of this complex, and Steele soils 30 percent. Undulating areas consisting of low rises and narrow depressions are included in mapping.

The Steele soils occur as patches of sand, or low mounds, that dot the dark surface of the complex. Between these patches are the Sharkey soils. The patches are extrusions of sand that were blown from fissures opened in 1811 during the New Madrid earthquake (*6*). Normally, the sand blow is a nearly circular patch of sand 8 to 15 feet across and 3 to 6 inches high, though some blows are as much as 100 feet wide and 600 feet or more long. The sand blows stand out strongly against the intermingled areas of dark soil. The Sharkey and the Steele soils have profiles similar to the ones described as typical for their series.

The Sharkey soils contract and crack when they dry, and they expand and the cracks seal when they are wet. Water moves very slowly through these soils except when they are cracked; then water enters the soils very rapidly until the cracks seal. The available water capacity is high in the Sharkey soils and moderate in the Steele soils. Natural fertility is moderate to high, and response to additions of fertilizer is good. These soils are slightly acid to moderately alkaline.

Tilth is difficult to maintain on the Sharkey soils. Because of the high content and the kind of clay, preparing a seedbed also is difficult. The Sharkey soils can be cultivated within only a narrow range of moisture content. After a rain, farming operations are commonly delayed unless surface drains are provided. If drained, well managed, and protected from flooding, these soils are fairly well suited to the common crops.

Water moves moderately rapidly in the upper sandy 20 to 36 inches of the Steele soils, but it moves very slowly in the underlying clayey part.

Maintaining tilth is easy on the Steele soils. Crops, however, wilt during short periods of drought unless plants are well rooted in the underlying clay. The frequently flooded areas are poorly suited to farming, but with drainage and protection from flooding, Steele soils are suited to most commonly grown crops. (Capability unit IIIw–1; if frequently flooded, capability unit Vw–1)

Sharkey and Steele soils (Sn).—This mapping unit consists of poorly drained Sharkey soils and moderately well drained Steele soils. These soils are near Big Lake in the northwestern part of the county. Some areas are frequently flooded.

Sharkey soils make up about 70 percent of the mapping unit, and Steele soils, 30 percent. Either or both kinds of soils may be in the areas mapped. Included in mapping are undulating areas consisting of narrow depressions that alternate with low rises.

The Steele soils occur as patches of sand, or low mounds, that dot the dark alluvial surface. The Sharkey soils are in strongly contrasting areas of darker soils between the patches of Steele soils. These patches are extrusions of sand that were blown from fissures opened during the New Madrid earthquake in 1811 (*6*). The normal sand blow is a nearly circular patch of sand 8 to 15 feet across and 3 to 6 inches high. Some blows, however, are as much as 100 feet wide and 600 feet or more long. The Sharkey and the Steele soils in this unit have profiles similar to the ones described as typical for their series.

The Sharkey soils contract and crack when they dry, and they expand and the cracks seal when they are wet. Water moves very slowly through these soils except when they are cracked; then water enters very rapidly until the cracks seal. The available water capacity of the Sharkey soils is high and of the Steele soils is moderate. Natural fertility is moderate to high in both these soils, and response to additions of fertilizer is good. Steele soils are slightly acid to moderately alkaline.

Maintaining tilth is difficult on the Sharkey soils. Because of the kind and amount of clay, preparing a seedbed also is difficult. The Sharkey soils can be cultivated within only a narrow range of moisture content. Consequently, farming operations are commonly delayed after a rain unless surface drains are provided. In well-managed, drained areas that are protected from flooding, the Sharkey soils are fairly well suited to the common crops.

Water moves rapidly through the upper 20 to 36 inches of the Steele soils, but it moves very slowly in the underlying clay. Response to additions of fertilizer and lime is moderate to good.

Tilth is easy to maintain on the Steele soils. Crops, however, are likely to wilt during short periods of drought unless plant roots are established in the underlying clay. If Steele soils are drained and protected from flooding, they are suited to most commonly grown crops. (Sharkey soils are in capability unit IIIw–1; Steele soils are in capability unit IIw–3; if frequently flooded, both soils are in capability unit Vw–1).

Steele Series

The soils of the Steele series consist of dark grayish-brown or brown loamy sand or silty clay loam. The material below is loamy sand overlying gray silt loam and dark-gray clay mottled with yellowish brown. Depth to the clayey layer ranges from 20 to 36 inches. These soils are moderately well drained.

Steele soils are on broad flats, where they developed in sandy, loamy, and clayey sediments. They are adjacent to Sharkey, Tunica, and Crevasse soils. The upper 20 to 36 inches of Steele soils is sandy and the lower part is dominantly clayey, whereas the Sharkey and Tunica soils are clayey within a depth of 10 inches or less from the surface, and the Crevasse soils are sandy to a depth of 40 inches or more.

Typical profile of Steele loamy sand in a cultivated area (NE¼NW¼SW¼ of section 20, T. 11 N., R. 10 E.):

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; loose; abundant small roots; slightly acid; abrupt, smooth boundary.

C1—6 to 20 inches, grayish-brown (10YR 5/2) loamy sand; common, medium, faint mottles of dark yellowish brown; single grain (structureless); very friable; loose; abundant small roots; mildly alkaline; abrupt, wavy boundary.

C2g—20 to 23 inches, gray (10YR 5/1) silt loam; common fine mottles of yellowish brown; massive to weak, fine, granular structure; friable; few small pores; alkaline; abrupt, wavy bounday.

IIC3g—23 to 64 inches, dark-gray (10YR 4/1) clay; common, fine and medium, distinct mottles of yellowish brown; massive (structureless); firm; few small roots and pores; few, small, dark, soft concretions; moderately alkaline; clear, smooth boundary.

IIC4g—64 to 76 inches, gray (10YR 5/1) silty clay loam; common, medium, distinct mottles of dark yellowish brown and common, medium, distinct mottles of yellowish brown; massive (structureless); friable; few small pores; few, medium, hard concretions of light gray; moderately alkaline.

The A horizon is dark grayish-brown or brown sand or silty clay loam. The C1 horizon is loamy sand or sand. In some places the C2g horizon is loamy sand. Depth to the clay substratum ranges from 20 to 36 inches. Reaction throughout is slightly acid to moderately alkaline.

Steele loamy sand (So).—This moderately well drained soil has a dark grayish-brown or brown loamy sand surface layer about 6 inches thick. It is underlain by grayish-brown loamy sand or sand over gray silt loam and dark-gray clay mottled with yellowish brown. Depth to the clayey layer ranges from 20 to 36 inches. This soil has the profile described as typical for the series. Some areas are frequently flooded.

Included with this soil in mapping are a few spots of Crevasse soils and undulating areas where narrow depressions alternate with low rises.

Water moves rapidly through the sandy upper 20 to 36 inches of this soil, but it moves very slowly into and through the underlying clayey part. This soil is slightly acid to moderately alkaline. The available water capacity and natural fertility are moderate, and response to additions of fertilizer and lime is moderate to good.

Tilth is easy to maintain. Crops wilt during short periods of drought unless plants are well rooted in the underlying clay. Farming operations are commonly delayed in spring unless surface drains are installed. If it is adequately drained and protected from flooding, this soil is suited to common crops. (Capability unit IIw–3; if frequently flooded, capability unit Vw–3)

Steele silty clay loam (Sr).—This moderately well drained soil has a dark grayish-brown to brown silty clay loam surface layer over grayish-brown loamy sand. Below this is dark-gray clay mottled with yellowish brown. Depth to this layer ranges from 20 to 36 inches. Some areas are frequently flooded. A few spots of Sharkey and Tunica soils are included in mapping.

Water moves through the upper 20 to 36 inches of this soil at a moderate to rapid rate, but it moves very slowly through the underlying clayey part. This soil is slightly acid to mildly alkaline and has moderate available water capacity and natural fertility. The response to additions of fertilizer and lime is moderate to good.

Tilth is fairly easy to maintain. Farming operations are commonly delayed after a rain unless surface drains are installed. If well drained and protected from overflow, the soil is well suited to commonly grown crops. (Capability unit IIw–1; if frequently flooded, capability unit Vw–1)

Steele and Crevasse soils (Ss).—This unit consists of moderately well drained and excessively drained soils that are mainly in the western part of the county. Some areas are frequently flooded. Steele and Crevasse soils occur in an irregular pattern. Either kind of soil may occur in a mapped area. Generally, about 70 percent of a mapped area is Steele soils and 25 percent is Crevasse soils. The soils have profiles similar to the ones described as typical for their series. The rest of the unit is included Sharkey and Tunica soils and undulating areas in which narrow depressions alternate with low rises.

Water moves rapidly in the sandy upper 20 to 36 inches of the Steele soils, but it moves very slowly in the underlying clayey part. Water moves rapidly through the Crevasse soils. The available water capacity is moderate in Steele soils and low in Crevasse soils. Response to fertilizer is moderate to good in Steele soils and moderate in Crevasse soils. Crevasse soils are medium acid to mildly alkaline, and Steele soils are slightly acid to moderately alkaline. Some areas of Crevasse soils respond to lime.

Natural fertility is moderate in the Steele soils and low in the Crevasse soils. Tilth is easy to maintain in both these soils. Crops grown on the Steele soils wilt during short periods of drought unless plants are well rooted in the underlying clay. Crops also wilt on the Crevasse soils during short periods of drought. Crevasse soils warm up early in spring and crops can be planted early. In spring, after a rain, farming operations on Steele soils are commonly delayed unless surface drains are installed. Under good management, Crevasse soils are fairly well suited to common cool-season crops. Drained areas of Steele soils are suited to the common crops. (Steele soils are in capability unit IIw–3; Crevasse soils are in capability unit IIIs–1; if frequently flooded, both soils are in capability unit Vw–3)

Steele and Tunica soils (St).—This mapping unit consists of moderately well drained and poorly drained soils on broad flats, mainly in the northwestern part of the county. Some areas are frequently flooded. The soils occur together in an irregular pattern. Both or either kind of soil may occur in a mapped area. Generally the mapping unit is about 50 percent Steele soils and 40 percent Tunica soils. Each kind of soil has a profile similar to that described as typical for its series. The rest is included Sharkey soils and undulating areas in which narrow depressions alternate with low rises.

Water moves rapidly through the sandy upper 20 to 36 inches of the Steele soils, but it moves very slowly in the underlying clayey part. Tunica soils contract and crack as they dry and water enters the soils very rapidly until the cracks seal; but when they get wet, the soils swell and the cracks seal. Then water moves through the soils very slowly. The Steele and Tunica soils are slightly acid to moderately alkaline. Available water capacity is moderate in the Steele soils and is high in the Tunica. The response to additions of fertilizer is moderate to good in Steele soils and good in

Tunica soils. Natural fertility is moderate in Steele soils and high in Tunica soils.

Maintaining tilth is easy in the Steele soils and difficult in the Tunica. Tunica soils can be cultivated only within a narrow range of moisture content, and preparing a seedbed is difficult because of the kind and the high content of clay. Farming operations are commonly delayed after a rain unless surface drains are installed. If adequately drained and protected from flooding, both soils are suited to common crops. (Steele soils are in capability unit IIw–3; Tunica soils are in capability unit IIw–1; both soils are in capability unit Vw–3 if frequently flooded)

Tiptonville Series

The soils of the Tiptonville series consist of very dark grayish-brown or dark-brown silt loam over very dark brown and brown silt loam and loam. The lower part of the subsoil is mottled with strong brown. Below the subsoil is yellowish-brown fine sandy loam mottled with gray and yellowish red. These soils are moderately well drained.

Tiptonville soils are on the lower part of natural levees, where they were mapped with Dubbs soils in an undifferentiated soil group. Tiptonville soils formed in beds of loamy alluvium. They are adjacent to well drained and moderately well drained Dubbs soils. The Tiptonville soils have a darker surface layer and are less well drained than Dubbs soils.

Typical profile of Tiptonville silt loam in a cultivated area (SE¼NW¼SW¼ of section 17, T. 10 N., R. 9 E.):

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, medium, granular structure; friable; abundant small roots and pores; few wormholes filled with very dark brown (10YR 2/2) silt loam; medium acid; abrupt, smooth boundary.

B21t—8 to 18 inches, very dark brown (10YR 2/2) silt loam; moderate, medium, subangular blocky structure; friable; abundant small roots; few small pores; few patchy clay films; medium acid; clear, wavy boundary.

B22t—18 to 27 inches, brown (10YR 4/3) loam; few, medium, distinct mottles of strong brown; weak, medium, subangular blocky structure; friable; few small roots and pores; few patchy clay films; cracks and some root holes filled with very dark grayish-brown (10YR 3/2) silt; medium acid; clear, wavy boundary.

C1—27 to 52 inches, yellowish-brown (10YR 5/4) fine sandy loam; common, medium, prominent mottles of yellowish red; massive (structureless); friable; few small roots and pores; few, small, brown and black concretions; few pores and root holes filled with very dark grayish-brown (10YR 3/2) silt; medium acid; clear, wavy boundary.

C2—52 to 72 inches, grayish-brown (10YR 5/2) fine sandy loam; common, medium, prominent mottles of yellowish red; common, medium, distinct mottles of gray and common, medium, faint mottles of yellowish brown; massive (structureless); friable; few small pores; few small brown and black concretions; medium acid.

The Ap horizon is very dark grayish brown or dark brown. The B22t horizon is dark grayish-brown or brown silty clay loam or loam. Reaction throughout is strongly acid to slightly acid.

Tiptonville and Dubbs silt loams (Td).—This unit consists of well-drained to moderately well drained soils that are mainly in the eastern part of the county. These soils occur in an irregular pattern and proportion. Either kind of soil may occur in a mapped area. Generally, the unit is about 50 percent Tiptonville soil and 40 percent Dubbs soil. The rest is included areas of Dundee soils. Also included are a few small areas having a surface layer of fine sandy loam or sandy loam, and undulating areas in which depressions alternate with low rises.

The surface layer of the Tiptonville soil is very dark grayish-brown silt loam about 8 inches thick. The upper part of the subsoil is very dark brown silt loam, and the lower part is brownish loam that is mottled with strong brown. Below this is mottled yellowish-brown fine sandy loam.

The surface layer of the Dubbs soil is pale-brown and dark grayish-brown silt loam about 11 inches thick. The subsoil is yellowish-brown silt loam in the upper part and is dark yellowish-brown sandy clay loam in the lower part. Below the subsoil is yellowish-brown loamy fine sand.

Water moves through these soils at a moderate rate. In places a plowsole restricts penetration of roots and movement of water. These soils are strongly acid or medium acid. The available water capacity and natural fertility are high. Crops respond well to additions of fertilizer and lime. Maintaining tilth is easy, and both of these soils are well suited to most common crops. (Capability unit I–1)

Tunica Series

The soils of the Tunica series consist of very dark grayish-brown, dark-brown, or dark grayish-brown silty clay over dark-gray or gray clay or silty clay mottled with yellowish brown. Below this, at a depth of 20 to 36 inches, is gray light silty clay loam, silt loam, loam, or fine sandy loam mottled with yellowish brown. These soils are poorly drained.

Tunica soils are at the higher elevations. They formed in moderately thick beds of sediments deposited by slack water and underlain by loamy sediments. Tunica soils are adjacent to Sharkey soils. They formed in beds of clayey material underlain by coarser textured sediments at a depth of 20 to 36 inches, whereas Sharkey soils formed in thick beds of clay.

Typical profile of Tunica silty clay in a cultivated area (NW¼NW¼SW¼ of section 12, T. 11 N., R. 10 E.):

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, fine to medium, subangular blocky structure; hard, firm, plastic; abundant small roots and pores; slightly acid; clear, smooth boundary.

B21g—8 to 24 inches, dark-gray (10YR 4/1) clay; common, fine, faint mottles of dark yellowish brown; moderate to strong, medium, subangular blocky structure; hard, firm, plastic; abundant small roots and pores; common slickensides; neutral; clear, smooth boundary.

IIB22g—24 to 45 inches, gray (10YR 5/1) silty clay loam; common, fine, distinct mottles of dark yellowish brown; weak, fine, subangular blocky structure; firm; abundant small roots and pores; neutral; gradual, wavy boundary.

IIC—45 to 72 inches, grayish-brown (10YR 5/2) silt loam; common, fine, distinct mottles of yellowish brown; massive (structureless); friable; few small roots; abundant small pores; moderately alkaline.

The A horizon is very dark grayish brown, dark brown, or dark grayish brown. The B21g horizon is silty clay or clay. The IIB22g horizon is silty clay loam, silt loam, loam, or fine sandy loam. Depth to the IIB22g horizon ranges from 20 to 36 inches. Reaction throughout ranges from slightly acid to moderately alkaline.

Tunica silty clay (Tu).—This soil has a very dark grayish-brown, dark-brown, or dark grayish-brown silty clay surface layer 5 to 9 inches thick. The subsoil is dark-gray and gray clay or silty clay and silty clay loam. It extends to a depth of about 45 inches and is underlain by silty clay loam, silt loam, loam, or fine sandy loam. Depth to material coarser than silty clay ranges from 20 to 36 inches. Some areas are frequently flooded.

Included with this soil in mapping are a few spots of Sharkey soils. Also included are undulating areas in which depressions alternate with low rises.

This soil contracts and cracks as it dries. When it gets wet it expands, and the cracks seal. Water moves through this soil very slowly except when it is cracked; then water enters very rapidly until the cracks seal. The available water capacity and natural fertility are high. Response to additions of fertilizer is good. This soil is slightly acid to moderately alkaline.

Maintaining tilth and preparing a seedbed are difficult because of the high content and the kind of clay in the soil. This soil can be cultivated within only a narrow range of moisture content. Farming operations are commonly delayed after a rain unless surface drains are installed. If drained and protected from flooding, this soil is suited to common crops. (Capability unit IIw-1; if frequently flooded, capability unit Vw-1)

Use and Management of Soils

Soils of Mississippi County are used mainly for cultivated crops and pasture. This section discusses uses of soils for these main purposes and gives basic practices of management. Also, it explains the capability classification of soils in the county and gives estimated yields of major cultivated crops. Also discussed are uses of soils in developing habitat for fish and wildlife; in building roads, reservoirs, and other engineering structures; and in improving areas for selected nonfarm uses.

Where information about the use of soils for crops and pasture is given, the procedure is to name groups that consist of similar soils and to suggest use and management for those groups. Soils in the subsections on wildlife, engineering, and nonfarm uses have not been grouped but are placed in tables so that properties significant to these uses can be readily given.

Use of Soils for Cultivated Crops and Pasture [2]

This subsection explains the system of capability grouping used by the Soil Conservation Service. It also describes management practices that are suitable for groups of similar soils, limitations to use, and management requirements. Also given are predicted yields of the major crops and pasture plants grown in the county.

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, 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.

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. (None in Mississippi County.)

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.

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. (None in Mississippi County.)

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 Mississippi County.)

[2] WILSON FERGUSON, management agronomist, Soil Conservation Service, assisted in preparing this subsection.

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.

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, IIw–2 or IIIs–1. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

Management by capability units

In this subsection the capability units in Mississippi County are described, and some suggestions for the use and management of soils in each group are given. The soils in each capability unit can be found by referring to the "Guide to Mapping Units" at the back of this survey.

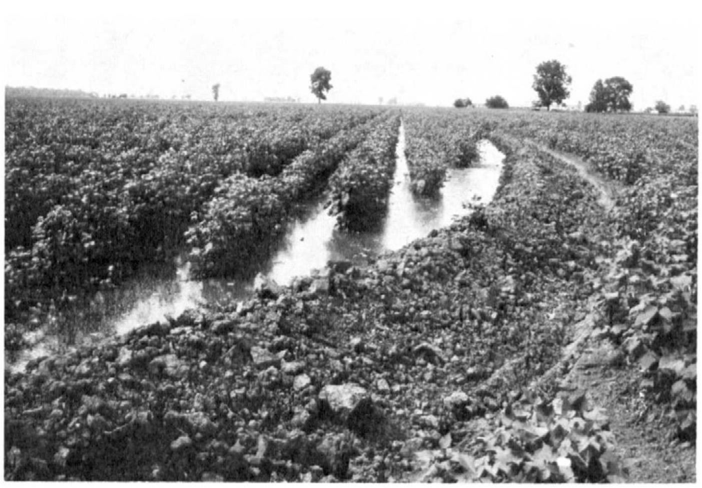

Figure 5.—**The cotton growing on Sharkey silty clay is irrigated by flooding.**

Basic practices of management should be applied on all the tillable soils in Mississippi County, or soils in capability units I–1, IIw–1, IIw–2, IIw–3, IIIw–1, IIIw–2, and IIIs–1. Among the practices needed on these groups of soils are (1) use of suitable cropping systems that return a large amount of residue annually; (2) use of good tillage methods; and (3) regular applications of lime and fertilizer, where needed. On the wetlands in the county, or soils in units IIw–1, IIw–2, IIw–3, IIIw–1, and IIIw–2, arrangement of crop rows and suitable drainage practices are needed for good plant growth. Supplemental irrigation water can be profitably applied on some crops during periods of drought (fig. 5).

The cropping systems used should control erosion, maintain organic-matter content, sustain or improve crop growth, and improve soil tilth. Where only a small amount of residue remains on the surface or where soil blowing is a hazard, grasses and legumes are needed at regular intervals in the cropping system.

Most of the acreage in Mississippi County is used for row crops year after year, and all cultivated soils in the county need residue management. Soils that benefit most from this management are probably the sandy ones, such as the Crevasse, Bruno, and Steele. These soils have limited available water capacity, and they contain a small amount of plant nutrients. Also, these soils are most likely to be damaged by soil blowing in some years if they are left bare early in spring. Although the sand is not blown far, the organic matter and fine soil material are winnowed.

A nitrogen fertilizer is needed on all nonleguminous crops. Some crops need phosphate and potash, but ordinarily these fertilizers are used in fairly small amounts. From 1947 to 1961, approximately 5,200 soil samples from Mississippi County were processed in the Soils Laboratory of the University of Arkansas. About 52 percent of the soils analyzed contained large amounts of available phosphorous and potassium and about 31 percent contained medium amounts. In fields where the rate of applying nitrogen fertilizer is high year after year, most crops respond noticeably to phosphorous and potassium.

The amounts of fertilizer and lime required can be determined from experiences of farmers, from past fertilization and cropping, and from the results of soil tests made in the laboratory of the University of Arkansas.

Most soils in the county contain moderate to large amounts of calcium. On some soils periodic application of agricultural limestone may be beneficial or necessary for the growth of some crops, such as soybeans and alfalfa.

Because of frequent use of heavy equipment and regular plowing to the same depth, a plowsole commonly forms in loamy soils in capability units I–1, IIw–2, and IIIw–2. Plowsoles can be eliminated or prevented by use of proper tillage, including minimum tillage, tillage at variable depths, and cultivating the soil when the moisture content is optimum. Use of deep-rooted legumes and grasses at regular intervals in the crop-

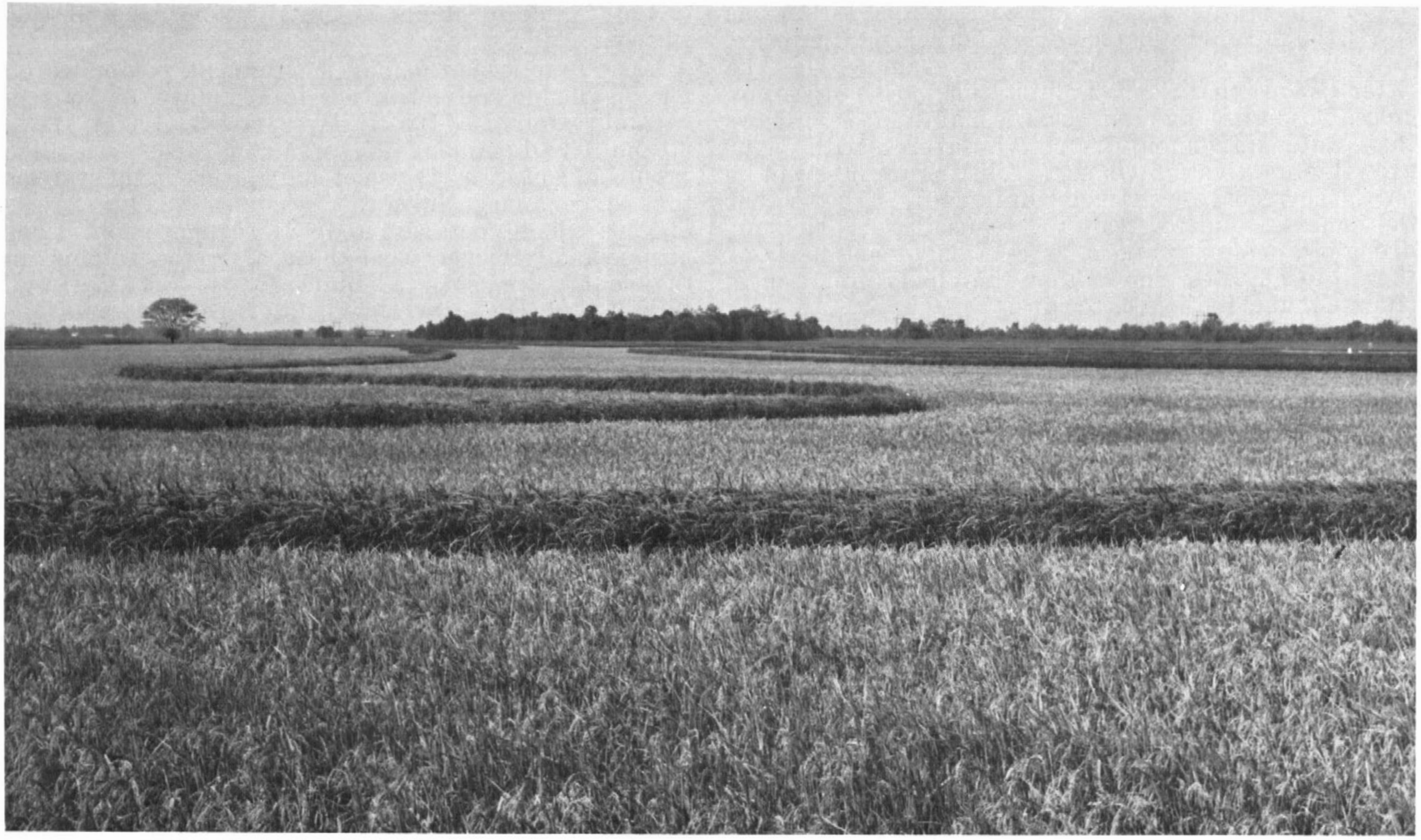

Figure 6.—**Rice growing on Alligator clay.**

ping system also helps to prevent and eliminate plowsoles. Where most soils are left bare, they are likely to pack and form crusts on the surface under heavy rains. Proper use of crop residue and cover crops helps to prevent this packing and crusting. Weed control is essential for good growth of crops.

In the following pages capability units are described and use and management of these soils are discussed.

CAPABILITY UNIT I-1

This capability unit consists of deep, somewhat poorly drained to well-drained soils that have a surface layer of silt loam, fine sandy loam, and sandy loam. Below this are loamy sediments.

The soils of this unit are very strongly acid to moderately alkaline and have high natural fertility and available water capacity. Water moves into and through these soils at a moderate to slow rate.

Some of the best soils for farming in the county are in this unit. These soils are suited to many kinds of row crops and truck crops. Under good management, cotton, soybeans, corn, small grains, and grain sorghum grow well. Green beans, tomatoes, okra, and asparagus are suitable truck crops. Suitable pasture grasses are johnsongrass, tall fescue, and bermudagrass. Well-suited legumes are vetch, crimson clover, annual lespedeza, sericea lespedeza, white clover, and alfalfa.

If adequately fertilized and properly tilled, the soils in this unit can be used year after year for cultivated crops that leave a large amount of residue.

CAPABILITY UNIT IIw-1

In this capability unit are poorly drained to moderately well drained soils. These soils have a surface layer of clay, silty clay, and silty clay loam. The subsoil is clay, silty clay, silty clay loam, silt loam, or loamy sand. Underlying the subsoil are sandy, loamy, and clayey sediments.

The soils in this unit are very strongly acid to alkaline and moderate to high in available water capacity and natural fertility. Water moves slowly through these soils except when they crack; then water enters very rapidly until the cracks seal. Runoff is slow and wetness is a moderate hazard.

Under good management, cotton, soybeans, corn, small grains, and grain sorghum are well suited. Adapted pasture grasses are bermudagrass, johnsongrass, and tall fescue. Adapted legumes are annual lespedeza, sericea lespedeza, crimson clover, and vetch. Alfalfa is a suited legume in some of the better drained areas.

In areas that are adequately drained, properly tilled, and adequately fertilized, cultivated crops that leave large amounts of residue can be grown year after year.

CAPABILITY UNIT IIw-2

This capability unit consists of poorly drained soils that have a silt loam or sandy loam surface layer. The subsoil is silt loam, silty clay, silty clay loam, and loam. Silty and loamy sediments occur below the subsoil.

These soils have high natural fertility and available water capacity. They are medium acid to mildly alkaline. Runoff is slow, and wetness is a moderate hazard.

Under good management, the soils in this unit are well suited to cotton, soybeans, corn, small grains, and grain sorghum. Adapted pasture grasses are bermudagrass, johnsongrass, and tall fescue. Adapted legumes are annual lespedeza, sericea lespedeza, crimson clover, and vetch. Alfalfa is a suited legume in some of the better drained areas.

If adequately drained, properly tilled, and adequately fertilized, these soils can be used year after year for cultivated crops that leave large amounts of residue.

CAPABILITY UNIT IIw-3

In this capability unit are moderately well drained soils. These soils have a surface layer of loamy sand. The material beneath the surface layer is loamy sand and silt loam over clay. Depth to this clay layer is 20 to 36 inches.

The soils in this unit are slightly acid to moderately alkaline and are moderate in available water capacity and natural fertility. Water moves into and through the sandy upper 20 to 36 inches of the profile rapidly, but it moves very slowly through the underlying clayey part. Runoff is medium or slow, and excess water is a moderate hazard. Droughtiness and soil blowing are slight to moderate hazards.

Under good management, these soils are suited to soybeans, cotton, grain sorghum, and small grains. Suitable pasture grasses are bermudagrass, johnsongrass, and tall fescue. White clover, vetch, and annual lespedeza are suited legumes.

If these soils are adequately drained, properly tilled, and well fertilized, cultivated crops that leave a large amount of residue can be grown year after year.

CAPABILITY UNIT IIIw-1

This capability unit consists of poorly drained soils that have a surface layer of clay, silty clay, or silty clay loam. Below this is clay that overlies clayey or loamy sediments.

The soils in this unit have moderate to high natural fertility and available water capacity. They are very strongly acid to moderately alkaline. Water moves through these soils very slowly except when they are cracked; then water enters very rapidly until the cracks are sealed. Runoff is slow, and excess water is a severe hazard.

Under good management, soybeans, cotton, grain sorghum, and rice are well suited (fig. 6). Adapted pasture grasses are bermudagrass and tall fescue, and white clover and vetch are suited legumes. Alfalfa is a suited legume in some of the better drained areas.

In areas that are properly tilled and adequately drained and fertilized, cultivated crops that leave large amounts of residue can be grown year after year.

CAPABILITY UNIT IIIw-2

In this capability unit are poorly drained soils. These soils have a surface layer of sandy loam, fine sandy loam, silt loam, or silty clay loam. The subsoil is silty clay, silty clay loam, clay loam, silt loam, or loam. Below the subsoil are clayey and loamy sediments.

The soils of this unit have high available water capacity and natural fertility and are very strongly acid to moderately alkaline. Water moves through the soils at a slow rate. Runoff is slow, and excess water is a severe hazard.

Under good management, these soils are well suited to soybeans, cotton, and grain sorghum. Bermudagrass, johnsongrass, and tall fescue are adapted pasture plants, and white clover and annual lespedeza are suited legumes. Alfalfa is a suited legume in some of the better drained areas.

If adequately drained, properly tilled, and adequately fertilized, these soils can be used year after year for cultivated crops that leave large amounts of residue.

CAPABILITY UNIT IIIs-1

This capability unit consists of excessively drained soils that have a surface layer of loamy sand. Below this is loamy sand or sand overlying loamy and sandy sediments.

The soils of this unit are strongly acid to mildly alkaline and are low in natural fertility. The available water capacity is low, and because they are droughty, their use for summer crops is severely limited.

Under good management, these soils are suited to wheat and oats. Bermudagrass and johnsongrass are adapted pasture grasses, and white clover and vetch are suited legumes.

If adequately fertilized and properly tilled, these soils can be used continuously for cultivated crops that leave large amounts of residue.

CAPABILITY UNIT Vw-1

This capability unit consists predominantly of poorly drained, clayey soils that are frequently flooded. Parts of the areas lie between the Mississippi River and its levee, and parts are in the Big Lake National Wildlife Refuge, the State-owned Big Lake Wildlife Game Management Area, and in the floodway below Big Lake.

The major soils of this unit have a surface layer of silty clay or silty clay loam. The upper part of the subsoil is clay, and the lower part ranges from clay to silt loam. The minor soils of this unit have a loamy sand surface layer, and the material beneath the surface layer ranges from loamy sand to clay.

These soils are slightly acid to moderately alkaline. Natural fertility ranges from high to low, and permeability ranges from very slow to rapid. The available water capacity is high to low.

Because flooding during the cropping season is a severe hazard, use for crops is severely limited. Cultivated crops cannot be grown in frequently flooded areas. The soils are best suited to pasture and trees and as habitat for wildlife. Bermudagrass, johnsongrass, tall fescue, and dallisgrass are suitable pasture grasses. Oak, sweetgum, cottonwood, water tupelo, and baldcypress are suitable trees.

CAPABILITY UNIT Vw-2

This capability unit consists mainly of loamy soils that are well drained to poorly drained. Most of these soils are in the frequently flooded parts of the area between the Mississippi River and its levee. Some areas are in the Big Lake National Wildlife Refuge, the State-owned Big Lake Wildlife Game Management Area, and in parts of the floodway below Big Lake.

The major soils in this unit have a fine sandy loam to silty clay loam surface layer. The subsoil or underlying material ranges from fine sandy loam to silty clay loam.

These soils are strongly acid to moderately alkaline. Natural fertility is high, permeability is moderate to slow, and the available water capacity is high.

Flooding during the cropping season is a severe hazard. Cultivated crops cannot be safely grown in frequently flooded areas. These soils are best suited to pasture and trees and are used as wildlife habitat. Suitable pasture grasses are bermudagrass, johnsongrass, tall fescue, and dallisgrass. Among the suitable trees are oak, sweetgum, cottonwood, and sycamore.

CAPABILITY UNIT Vw-3

This capability unit consists mostly of sandy soils that are moderately well drained to excessively drained. They are in the frequently flooded parts of the area between the Mississippi River and its levee, within the Big Lake National Wildlife Refuge, the State-owned Big Lake Wildlife Game Management Area, and in parts of the floodway below Big Lake.

The major soils in this unit have a loamy sand surface layer, and the material beneath is loamy sand or sand. Some of the soils have clay at a depth of 20 to 36 inches.

These soils range from slightly acid to mildly alkaline. Permeability is rapid in the upper layers of loamy sand or sand but is very slow in the underlying clayey part. The available water capacity and natural fertility are low to moderate.

Flooding during the cropping season is a severe hazard. The frequently flooded areas cannot be safely farmed to cultivated crops. These soils are better suited to pasture and trees than to cultivated crops and are used as habitat for wildlife. Bermudagrass and johnsongrass are fairly well suited pasture grasses. Oaks, sweetgum, cottonwood, and sycamore are suitable trees on the soils with clayey underlying material. Where the underlying material is loamy sand or sand, cottonwood and sycamore are fairly well suited.

CAPABILITY UNIT VIIw-1

The only mapping unit in this capability unit is Alluvial land. This land consists of mixed alluvial sediments deposited along the banks of the Mississippi River. The areas are subject to flooding several times a year. Soil materials are removed and fresh sediments are deposited in many places. The sediments range from clay to loamy sand and are neutral to moderately alkaline.

Because of the frequent flooding, this land cannot be used safely for crops or pasture. The areas are suited to flood-tolerant hardwoods and as wildlife habitat.

Predicted yields

Yields predicted for the principal crops grown on the arable soils in Mississippi County are given in table 2. The predictions are based mainly on information obtained from field experiments and from farmers and others who are familiar with the soils and crops in the county. In years when crops receive adequate rainfall during the growing season, yields are generally larger than those given in table 2.

The yields given in table 2 are not the highest that can be obtained, but they are yields received over a period of years by farmers who practice good management. These practices are (1) using proper equipment to prepare the soils, plant crops, control weeds, and harvest crops early; (2) following systematic programs for control of insects and plant diseases; (3) applying fertilizer in kinds and amounts that are indicated by soil tests; (4) choosing suitable crop varieties; (5) using supplemental irrigation systems to irrigate crops during droughts; and (6) constructing adequate drainage systems for improving surface drainage during wet seasons. By intensifying one or more of these practices, higher yields than those given in table 2 have been obtained on many farms.

Average yields lower than those given can be expected if the farmer has insufficient equipment, which commonly leads to inadequate preparation of seedbeds, poor weed control, and late harvesting. If some or all of these practices are omitted or if they are poorly applied, the yields can be expected to be lower.

Use of Soils for Wildlife and Fish [3]

Soils are related to the kinds and abundance of wildlife through the vegetation they support and the habitat the vegetation provides. Desirable habitat depends on the nearness of vegetation and water. The kind and amount of vegetation is closely related to soil characteristics and land use.

All fish and wildlife respond to the basic characteristics of soils. This response is affected in many ways by fertility, slope, degree of erosion, and other characteristics of soils. The permeability rate determines whether or not the soils can hold enough water for ponds and lakes.

Extensive wooded areas, such as those in the vicinity of Big Lake and a few areas along the Mississippi River, are well suited as habitat for deer, wild turkey, squirrel, and songbirds because these areas provide suitable food, cover, and drinking water. Not many people live in these areas, and wildlife are not unduly disturbed.

In table 3 the soils of the county are rated according to their suitability for plants, for water developments used by wildlife, and as habitat for openland, woodland, and wetland wildlife. The ratings given in the table are *well suited, suited,* and *poorly suited.* These ratings are based on the suitability of the soil for the habitat element. Well suited indicates that the soils are relatively free of limitations or that the limitations

[3] ROY A. GRIZZELL, JR., biologist, Soil Conservation Service, assisted in preparing this section.

TABLE 2.—*Predicted average acre yields of principal crops* [1]

[Absence of yield indicates crop is not suited to or is not commonly grown on the soil; Alluvial land and Borrow pits are not used for cultivated crops and are not listed in table 2]

Mapping unit	Cotton	Soybeans	Rice	Wheat	Alfalfa
	Lb. of lint	*Bu.*	*Bu.*	*Bu.*	*Tons*
Alligator clay	450	34	90	35	
Amagon sandy loam	550	36	85	38	2.5
Bowdre silty clay loam	650	38		40	4.0
Bruno-Crevasse complex	400	20		24	
Commerce silt loam	800	44		45	4.5
Convent fine sandy loam	775	44		45	4.5
Crevasse loamy sand	360	18		22	
Crowley silt loam	650	32	85	40	3.5
Dundee silt loam	750	40		45	3.5
Dundee-Dubbs-Crevasse complex	690	32		38	
Earle clay	600	34	95	38	2.5
Forestdale silt loam	550	36	85	38	2.5
Forestdale silty clay loam	525	32	85	35	2.5
Forestdale-Routon complex	550	34	85	36	2.5
Hayti fine sandy loam	600	36		38	3.3
Iberia clay	550	36	95	37	3.0
Jeanerette silt loam	650	40	80	42	3.5
Morganfield fine sandy loam	800	40		45	4.5
Routon-Dundee-Crevasse complex	550	32		34	
Sharkey silty clay loam	525	40	95	42	3.0
Sharkey silty clay	500	38	95	40	2.8
Sharkey-Crevasse complex	430	28		30	2.5
Sharkey-Steele complex	480	32	85	35	3.0
Sharkey and Steele soils	550	36	85	38	3.0
Steele loamy sand	490	32	75	40	3.0
Steele silty clay loam	600	40	80	42	3.5
Steele and Crevasse soils	480	28		38	3.0
Steele and Tunica soils	600	40	80	42	3.5
Tiptonville and Dubbs silt loams	800	40		45	4.0
Tunica silty clay	600	40	80	42	3.5

[1] Wilson Ferguson, management agronomist, Soil Conservation Service, assisted in preparing this table.

are easily overcome; suited means that the limitations need consideration but can be overcome by good management; and poorly suited indicates that the limitations are severe enough to make use of soils for the kind of wildlife or habitat questionable.

The seven elements of wildlife habitat are defined in the following paragraphs, and examples are given of each.

Grain and seed crops consist of domestic grains or seed-producing annuals that produce food for wildlife. Examples are wheat, corn, sorghums, oats, millet, rice, soybeans, and sunflower.

Grasses and legumes are domestic or introduced plants that furnish food and cover for wildlife. Examples are tall fescue, bermudagrass, bahiagrass, panicgrasses, bristlegrasses, clover, and alfalfa.

Wild herbaceous upland plants are native or introduced perennial grasses and forbs (weeds) that provide food and cover primarily for upland wildlife. These plants are established naturally. Examples are croton, pokeberry, tick clovers, wild beans, wild peas, partridgepeas, bluestems, indiangrass, strawberries, and wild lespedeza.

Hardwood woody plants are nonconiferous trees, shrubs, and woody vines that furnish fruits, nuts, seed, buds, twigs (browse), or foliage that are used by wildlife. Most species are established naturally, but they also may be seeded. Examples of trees are oak, cherry, mulberry, dogwood, viburnum, and maple. Examples of vines and shrubs are blueberry, honeysuckle, blackberry, greenbrier, wildgrape, and multiflora rose.

Wetland food and cover plants are annual and perennial, domestic or wild herbaceous plants that grow on moist or wet sites. These plants produce the food and cover commonly used by wildlife. Examples are rice, smartweeds, wild millet, rice cutgrass, cattails, naiads, pondweeds, water lilies, and sesbonia.

Shallow water developments are areas that have been made by impounding water, by digging excavations, or by using devices to control water. In table 3 the soils are rated according to their suitability for developments that generally are not more than 6 feet deep. Examples are ricefields, flooded soybean fields, shallow dugouts, and devices that control the water level in sloughs and swales.

Excavated ponds are dug-out or impounded areas that hold enough water of suitable depth and quality to support fish or wildlife.

In table 3 the wildlife in the county are classified as open-land, woodland, and wetland.

Open-land wildlife are animals that normally inhabit cropland, pastures, meadows, and odd fields of herbaceous vegetation. They include bobwhites, doves, cottontail rabbits, and other farm game.

Woodland wildlife include animals that normally inhabit wooded areas of trees and shrubs. They require more of the wooded kind of cover mixed with other kinds. Among the woodland wildlife in the county are

TABLE 3.—*Suitability of soils for elements of*

[Absence of entry indicates mapping unit is not suited to the

Mapping unit and symbol	Elements of wildlife habitat		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants
Alligator clay: Aa	Suited	Suited	Suited
Alluvial land: Ad	Poorly suited	Suited	Suited
Amagon sandy loam: An	Suited	Suited	Suited
Borrow pits: Bp			
Bowdre silty clay loam: Br	Well suited	Well suited	Well suited
Bruno-Crevasse complex: Bv	Suited	Suited	Suited
Commerce silt loam: Cm	Well suited	Well suited	Well suited
Convent fine sandy loam: Cn	Well suited	Well suited	Well suited
Crevasse loamy sand: Cr	Suited	Suited	Suited
Crowley silt loam: Cw	Suited	Suited	Suited
Dundee silt loam: Du	Well suited	Well suited	Well suited
Dundee-Dubbs-Crevasse complex: Dv	Well suited	Well suited	Well suited
Earle clay: Ec	Suited	Suited	Suited
Forestdale silt loam: Fe	Suited	Suited	Suited
Forestdale silty clay loam: Fo	Suited	Suited	Suited
Forestdale-Routon complex: Fr	Suited	Suited	Suited
Hayti fine sandy loam: Ha	Well suited	Well suited	Well suited
Iberia clay: Ib	Suited	Suited	Suited
Jeanerette silt loam: Je	Well suited	Well suited	Well suited
Morganfield fine sandy loam: Mo	Well suited	Well suited	Well suited
Routon-Dundee-Crevasse complex: Rd	Well suited	Well suited	Well suited
Sharkey silty clay loam: Sc	Suited	Suited	Suited
Sharkey silty clay: Sh	Suited	Suited	Suited
Sharkey-Crevasse complex: Sk	Suited	Suited	Well suited
Sharkey-Steele complex: Sm	Suited	Suited	Well suited
Sharkey and Steele soils: Sn	Suited	Suited	Well suited
Steele loamy sand: So	Suited	Well suited	Well suited
Steele silty clay loam: Sr	Well suited	Well suited	Well suited
Steele and Crevasse soils: Ss	Suited	Suited	Well suited
Steele and Tunica soils: St	Suited	Suited	Well suited
Tiptonville and Dubbs silt loams: Td	Well suited	Well suited	Well suited
Tunica silty clay: Tu	Suited	Suited	Well suited

forest game such as deer, raccoon, turkeys, and squirrels.

Wetland wildlife are animals that normally inhabit wet areas, such as ponds, marshes, rivers, streams, and swamps. They include wood ducks, mallards, Canada geese, rail, heron, mink, and muskrat.

Wildlife habitat may be managed by planting choice food plants, by managing existing vegetation, and by locating water developments where water is scarce or needed. Information about soils provides a basis for improving habitat for many kinds of wildlife. The present vegetation reflects past land use. Unless the vegetation is correlated with the soil, it may be a false criterion in judging potential for developing wildlife habitat.

Information about the soils helps the landowner to determine specific sites for wildlife development and to establish food plants and cover. This knowledge can be used as a basis for preparing either small or large area maps that show present and projected conditions of the habitat.

Local representatives of the Soil Conservation Service may be consulted for help in planning and establishing food supply and habitat for a special area. For additional information on the suitability of each soil, refer to the detailed soil descriptions in the section "Descriptions of the Soils."

Engineering Uses of Soils [4]

In this subsection engineering test data for selected soils in Mississippi County are given, and properties of the soils in the county are estimated. Interpretations of soil characteristics that affect their suitability for specific engineering purposes are also given.

This information is helpful to engineers, farmers, and others who use the soils as structural material or as foundation material on which structures are built. Some soil properties are of special interest because they affect construction and maintenance of roads, airports, pipelines, building foundations, water storage facilities, erosion control structures, drainage systems, and sewage disposal systems. Among the soil properties most important to engineers are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell characteristics, grain size, plasticity, and reaction. Depth to water table, depth to bedrock, and relief are also important.

[4] KIRK WALKER, JR., civil engineer, Soil Conservation Service, assisted in preparing this subsection.

wildlife habitat and kinds of wildlife

element of wildlife habitat or to the kind of wildlife]

Elements of wildlife habitat—Continued				Kinds of wildlife		
Hardwood woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Open-land wildlife	Woodland wildlife	Wetland wildlife
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Suited	Suited			Suited	Well suited	Suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Poorly suited	Suited	Poorly suited	Suited			Suited.
Well suited	Well suited	Well suited	Suited	Well suited	Well suited	Suited.
Suited				Suited	Suited	
Well suited	Suited	Suited	Suited	Well suited	Well suited	Suited.
Well suited	Suited	Suited	Suited	Well suited	Well suited	Suited.
Suited				Suited	Suited	
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Suited	Suited	Suited	Well suited	Well suited	Suited.
Well suited	Suited	Suited	Poorly suited	Well suited	Well suited	Suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Suited	Suited	Suited	Suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Well suited	Well suited	Well suited.
Well suited	Poorly suited	Suited	Poorly suited	Well suited	Well suited	Poorly suited.
Well suited	Suited	Suited	Suited	Well suited	Well suited	Suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Suited	Suited	Well suited	Suited	Well suited	Suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Suited	Suited	Suited	Well suited	Well suited	Suited.
Well suited	Well suited	Well suited	Well suited	Well suited	Well suited	Well suited.
Well suited	Suited	Suited	Suited	Suited	Well suited	Suited.
Well suited	Well suited	Well suited	Well suited	Well suited	Well suited	Well suited.
Well suited	Poorly suited	Suited	Poorly suited	Well suited	Well suited	Suited.
Well suited	Well suited	Well suited	Suited	Suited	Well suited	Well suited.

Engineers can use the information in this survey to—

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils for use in planning agricultural drainage systems, farm ponds, dikes, and irrigation systems.
3. Make preliminary evaluations of the soil and ground conditions that will aid in selecting locations for highways and airports and in planning detailed investigations at the selected location.
4. Locate probable sources of gravel, sand, and other construction materials.
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 units for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from other published maps and reports and from aerial photographs for the purpose of making maps and reports that will be more useful to engineers.
8. Make preliminary evaluation of the suitability of a particular area for construction purposes.

Although the engineering interpretations in this subsection can be useful for many purposes, it should be emphasized that they may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and where the excavations are deeper than the depths of layers reported. Even in these situations, however, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some of the terms used by the soil scientist may not be familiar to the engineer, and some terms may have a special meaning in soil science. These and other special terms used in this survey are defined in the Glossary.

Most of the information in this subsection is in tables 4, 5, and 6. Additional information useful to engineers can be found in other sections of this soil survey, particularly "Descriptions of the Soils," and "Nonfarm Uses of Soils."

Engineering classificaton systems

Two systems of classifying soils are in general use by engineers. Both of these systems are used in this survey.

Many engineers use the system of soil classification developed by the American Association of State Highway Officials (AASHO) *(1)*. In this system, soils are placed in seven main groups on the basis of field performance. The groups range from A–1 (the soils most suitable for road subgrade) to A–7 (clayey soils that are least suitable). Of these groups, only A–2, A–3, A–4, A–6, and A–7 occur in Mississippi County. Within each group the relative engineering value of the soil material is indicated by a group index number. Under AASHO Designation M 145–49, group index numbers range from 0 for the best material to 33 for the poorest. AASHO Designation M 145–66I has no upper limit for group index numbers. They are shown in table 4, in parentheses after the AASHO classification symbols.

The Unified system of soil classification was established by the Corps of Engineers, U. S. Army *(15)*. This system is based on texture and plasticity of soils and the performance of the soils as material for engineering works. Of the 15 classes in this system, eight are for coarse-grained material, six for fine-grained material, and one for highly organic material. Each class is identified by a letter symbol. The only classes in Mississippi County are CL, CH, ML, MH, SC, SM, and SP. Soils in class CL are silts and clays that have low liquid limit. CH identifies inorganic clays that are highly plastic, and ML identifies inorganic silts and very fine sands, rock flour, silty or clayey fine sands, and clayey silts. Soils in class MH are inorganic silts, micaceous or diatomaceous fine sands or silts, and elastic silts. Soils in class SC are sands mixed with a large amount of fines, mostly silt. Soils in class SP consist of poorly graded sands and gravelly sands and little or no fines.

Engineering test data

Soil samples taken from 11 profiles in Mississippi County were tested in accordance with standard procedures of the American Association of State Highway Officials. The results of these tests are given in table 4. The table shows the depth to which sampling was done and the results of tests for particle-size distribution.

The engineering classifications given in table 4 are based on data obtained by mechanical analyses and on the results of tests to determine the liquid limit and plasticity index. The mechanical analyses were made by combined sieve and hydrometer methods.

The results of the mechanical analyses may be used to determine the relative proportions of the different sized particles that pass sieves of specified sizes. Sand and other kinds of coarser materials do not pass through the No. 200 sieve, though silt and clay do pass through this sieve. Silt is that material larger than 0.002 millimeter in diameter that passes through the No. 200 sieve. Clay is that fraction smaller than 0.002 millimeter in diameter that passes through the No. 200 sieve. The clay fraction was determined by the hydrometer method rather than the pipette method that most soil scientists use.

Tests for the liquid limit and plastic limit measure 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 soil 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. The *plasticity index* is the numerical difference between liquid limit and plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Table 4 also gives moisture-density data for the tested soils. If a soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material will increase until the optimum moisture content is reached. After that, the density decreases as the moisture content increases. The highest dry density obtained in the compaction test is termed *maximum dry density*, and the corresponding moisture content is the *optimum moisture*.

Engineering properties of soils

In table 5 the soil series and map symbols for each series are listed, and estimated properties of soils significant in engineering are given. The estimates are based on data shown in table 4, on field experience with similar soils in other counties, and on information in other parts of this survey. Because properties for Borrow pits and Alluvial land are variable, they are excluded from the table. Depth to bedrock was omitted from the table, because all of the soils are deep over bedrock and bedrock does not affect use and management of the soils in Mississippi County.

For each major horizon in a typical profile, the dominant USDA texture and the estimated Unified and AASHO classifications are listed in table 5. USDA texture is determined by the proportion of sand, silt, and clay in soil material less than 2.0 millimeters in diameter. The terms "sand," "silt," and "clay" are defined in the Glossary.

The columns headed "Percentage passing sieve" show the percentage of soil material small enough to pass the openings of No. 10 and 200 sieves.

Permeability, given in table 5, refers only to movement of water downward through undisturbed soil. The estimates, in inches per hour, are based on soil structure without compaction. Not considered in table 5 are plowpans, crusts on the surface, and other properties that result from use of the soil.

Available water capacity is an estimate of the amount of water in inches per inch of soil depth that is held at field capacity over that held at a tension of 15 atmospheres.

Reaction refers to the degree of acidity or alkalinity of a soil, expressed as a pH value. A pH of 7.0 is neutral; values lower than 7.0 are acid, and values higher are alkaline.

Shrink-swell potential indicates how much the volume of soil material changes as moisture content

TABLE 4.—Engineering test data

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

Soil name and location	Parent material	Depth	Mechanical analysis[1] Percentage passing sieve— No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	Liquid limit	Plasticity index	Moisture density[2] Maximum dry density	Optimum moisture	Classification AASHO[3]	Unified[4]
		Inches					*Lb. per cu. ft.*	*Percent*		
Alligator clay:										
SE¼NE¼SE¼ sec. 20, T. 10 N., R. 8 E. (Modal).	Alluvial.	20–51	[5]99	97	62	33	91	28	A-7-6(20)	CH
		51–74	[5]99	98	63	40	98	23	A-7-6(20)	CH
Bruno loamy fine sand:										
NE¼SE¼NE¼ sec. 30, T. 10 N., R. 9 E. (Modal).	Alluvial.	17–48	100	21	....	[6]NP	100	17	A-2-4(0)	SM
		48–78	100	16	....	NP	98	17	A-2-4(0)	SM
Convent fine sandy loam:										
SE¼NW¼SE¼ sec. 12, T. 11 N., R. 10 E. (Modal).	Alluvial.	0–7	100	42	....	NP	110	14	A-4(1)	SM
		11–23	100	95	44	21	97	20	A-7-6(14)	CL
		39–61	100	95	....	NP	104	18	A-4(8)	ML
Crevasse loamy sand:										
SE¼SW¼SW¼ sec. 15, T. 11 N., 10 E. (Nonmodal).	Alluvial.	12–28	100	17	....	NP	102	17	A-2-4(0)	SM
		47–73	100	98	64	30	88	29	A-7-5(23)	MH-CH
Dubbs silt loam:										
6 miles west and 1½ miles southwest of Joiner on Arkansas State Highway 118, 1,000 feet southeast of cemetery (Modal).	Alluvial.	10–17	100	87	35	11	102	18	A-6(8)	ML-CL
		28–36	100	32	[6]NP	NP	99	16	A-2-4(0)	SM
		46–64	100	31	NP	NP	96	17	A-2-4(0)	SM
Dundee silt loam:										
¾ mile northwest of Birdsong (Modal).	Alluvial.	4–14	100	94	44	19	96	21	A-7-6(12)	ML-CL
		14–21	100	43	NP	NP	105	16	A-4(2)	SM
		51–64	100	36	NP	NP	97	16	A-4(0)	SM
Earle clay:										
SE¼SE¼SE¼ sec. 20, T. 10 N., R. 8 E. (Modal).	Alluvial.	5–34	[5]99	96	66	35	91	28	A-7-5(26)	CH
		34–55	[5]99	89	33	10	107	18	A-4(8)	CL-ML
		55–76	[5]99	97	54	27	96	24	A-7-6(19)	CH
Morganfield fine sandy loam:										
NW¼SE¼SE¼ sec. 12, T. 11 N., R. 11 E. (Modal).	Alluvial.	11–32	100	86	26	4	108	16	A-4(8)	CL-ML
		32–82	100	91	....	NP	102	18	A-4(8)	ML
Sharkey silty clay:										
SW¼SW¼SW¼ sec. 12, T. 11 N., R. 10 E. (Modal).	Alluvial.	6–34	100	98	75	43	86	30	A-7-5(32)	CH
Steele loamy sand:										
NE¼SW¼NE¼ sec. 12, T. 11 N., R. 10 E. (Modal).	Alluvial.	12–20	100	10	....	NP	104	16	A-3(0)	SM-SP
		22–31	100	98	43	15	99	22	A-7-6(11)	ML-CL
		38–72	100	97	81	44	84	32	A-7-5(33)	MH-CH
Tunica silty clay:										
NW¼NW¼SW¼ sec. 12, T. 11 N., R. 10 E. (Modal).	Alluvial.	8–24	[5]99	98	71	41	91	28	A-7-5(30)	CH
		45–72	100	92	32	7	105	18	A-4(8)	ML

[1] Mechanical analyses according to the AASHO Designation: T 88. Results by this procedure 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 all 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 used in this table are not suitable for naming textural classes for soil.

[2] Based on AASHO Designation: T 99-57, Method A (*1*).

[3] Data for Dubbs and Dundee soils based on AASHO Designation: M 145-49. Data for all other soils based on M 145-66I.

[4] Based on the Unified Soil Classification System, Technical Memorandum No. 3-357, v. 1, Corps of Engineers (*15*). SCS and BPR have agreed to consider that all soils having plasticity indexes within two points of the A-line are to be given a borderline classification. An example of a borderline classification obtained by this use is CL-ML.

[5] 100 percent passed the No. 10 sieve.

[6] Nonplastic.

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TABLE 5.—*Estimated engineering*

[The symbol > means greater

Soil series and map symbols	Depth to seasonal high water table [1]	Depth from surface	Classification: Dominant USDA texture [2]
	Feet	*Inches*	
Alligator:			
Aa	0–0.5	0–9	Clay
		9–20	Clay
		[4]20–51	Clay
		[4]51–74	Clay
Amagon:			
An	0.5–1	0–8	Sandy loam
		8–15	Silt loam
		15–22	Silty clay loam
		22–36	Silty clay loam
		36–60	Silty clay loam
		60–72	Silt loam
Bowdre:			
Br	3–6	0–6	Silty clay loam
		6–17	Silty clay
		17–28	Loam
		28–68	Fine sandy loam
		68–74	Silt loam
Bruno:			
Bv	4–6	0–7	Loamy sand
(For properties of the Crevasse soil in Bv, refer to the Crevasse series.)		7–19	Loamy sand
		19–32	Sandy loam
		32–48	Sand
		48–56	Loam
		56–72	Sandy loam
Commerce:			
Cm	1–3	0–6	Silt loam
		6–22	Silty clay loam
		22–58	Silt loam
		58–80	Silty clay loam
Convent:			
Cn	1–3	[4]0–7	Fine sandy loam
		7–11	Loam
		[4]11–23	Heavy silt loam
		23–39	Silt loam
		[4]39–61	Very fine sandy loam
		61–74	Silt loam
Crevasse:			
Cr	3–6	0–6	Loamy sand
		6–36	Sand
		36–65	Sand
Crowley:			
Cw	0–1	0–6	Silt loam
		6–10	Silt loam
		10–16	Silt loam
		16–29	Silty clay
		29–35	Silty clay loam
		35–46	Silty clay loam
		46–59	Silt loam
		59–80	Silt loam
Dubbs	2–4	0–4	Sandy loam
(Mapped only in complex Dv and in undifferentiated unit Td.)		4–11	Silt loam
		11–24	Silt loam
		24–40	Sandy clay loam
		40–60	Loamy fine sand

properties of soils

than; < means less than]

Classification		Percentage passing sieve—		Permeability	Available water capacity [3]	Reaction	Shrink-swell potential
Unified	AASHO	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
				Inches per hour	*Inches per inch of soil*	*pH*	
CH	A–7	100	95–100	0.06–0.2	0.19	5.6–6.0	High.
CH	A–7	100	95–100	<0.06	.19	4.5–5.5	High.
CH	A–7	100	95–100	<0.06	.19	4.5–5.8	High.
CH	A–7	100	95–100	<0.06	.19	6.6–7.3	High.
SM or ML	A–4	100	40–55	0.63–2.0	.15	4.5–7.3	Low.
ML	A–4	100	75–85	0.2–0.63	.22	4.5–7.3	Moderate.
CL	A–6	100	80–90	0.06–0.2	.21	4.5–6.0	Moderate.
CL	A–6	100	80–90	0.06–0.2	.21	4.5–6.0	Moderate.
CL	A–6	100	70–90	0.06–0.2	.21	4.5–6.0	Moderate
ML	A–4	100	75–85	00.2–0.63	.22	6.1–8.5	Low.
CL	A–6	100	90–95	0.2–0.63	.21	5.6–6.5	Moderate.
CL or CH	A–6 or A–7	100	90–100	0.06–0.2	.19	5.6–6.5	High.
ML or CL	A–4 or A–6	100	70–85	0.2–0.63	.17	5.6–6.5	Low.
SM	A–2, A–4	100	30–45	0.63–2.0	.16	5.6–6.5	Low.
ML or CL	A–4	100	75–85	0.2–0.63	.21	5.6–6.5	Low.
SM	A–2	100	20–35	> 6.3	.10	5.1–7.8	Low.
SM	A–2	100	20–35	> 6.3	.08	5.1–7.8	Low.
SM	A–2	100	20–40	2.0–6.3	.16	5.1–7.8	Low.
SM	A–2 or A–3	100	15–30	> 6.3	.05	5.1–7.8	Low.
ML	A–4	100	60–85	0.63–2.0	.17	5.1–7.8	Low.
SM	A–2	100	20–40	2.0–6.3	.16	5.1–7.8	Low.
ML or CL	A–4	100	80–95	0.63–2.0	.22	6.1–8.4	Low.
CL	A–6	100	90–100	0.2–0.63	.21	6.1–8.4	Moderate.
ML or CL	A–4 or A–6	100	90–100	0.2–0.63	.22	6.1–8.4	Low.
CL	A–6	100	90–100	0.2–0.63	.21	6.1–8.4	Moderate.
SM	A–2, A–4	100	30–50	0.63–2.0	.16	6.1–8.4	Low.
ML	A–4	100	60–85	0.63–2.0	.17	6.1–8.4	Low.
CL	A–6 or A–7	100	90–100	0.63–2.0	.22	6.1–8.4	Low.
ML or CL	A–4 or A–6	100	90–100	0.63–2.0	.22	6.1–8.4	Low.
ML	A–4	100	90–100	0.63–2.0	.17	6.1–8.4	Low.
ML or CL	A–4 or A–6	100	90–100	0.63–2.0	.22	6.1–8.4	Low.
SM	A–2	100	15–25	> 6.3	.08	6.1–8.4	Low.
SM or SM–SP	A–2 or A–3	100	10–20	> 6.3	.05	6.1–8.4	Low.
SM or SM–SP	A–2 or A–3	100	10–20	> 6.3	.05	6.1–8.4	Low.
ML	A–4	100	90–100	0.2–0.63	.22	6.6–8.4	Low.
ML or CL	A–4	100	90–100	0.2–0.63	.22	6.6–8.4	Low.
ML or CL	A–4	100	90–100	0.2–0.63	.22	6.6–8.4	Low.
CH	A–7 or A–6	100	95–100	<0.06	.19	6.6–8.4	High.
CL or CH	A–7 or A–6	100	90–100	0.2–0.63	.21	6.6–8.4	Moderate.
CL or CH	A–7	100	90–100	0.2–0.63	.21	6.6–8.4	Moderate.
CL or ML	A–4 or A–6	100	90–100	0.2–0.63	.22	6.6–8.4	Low.
CL or ML	A–4 or A–6	100	90–100	0.2–0.63	.22	6.6–8.4	Low.
SM	A–2 or A–4	100	30–50	2.0–6.3	.14	5.1–6.0	Low.
ML or CL	A–4 or A–6	100	70–90	0.63–2.0	.22	5.1–6.0	Low.
ML or CL	A–4 or A–6	100	75–95	0.63–2.0	.22	5.1–6.0	Low.
SC or CL	A–6	100	45–60	0.63–2.0	.17	5.1–6.0	Moderate.
SM	A–2	100	20–40	2.0–6.3	.08	5.1–6.0	Low.

TABLE 5.—*Estimated engineering*

Soil series and map symbols	Depth to seasonal high water table [1]	Depth from surface	Classification: Dominant USDA texture [2]
	Feet	*Inches*	
Dundee:			
Du, Dv	0.5–1	0–7	Silt loam
(For properties of the Crevasse soil and of the Dubbs soil in Dv, refer to their respective series.)		7–13	Silty clay loam
		13–31	Silty clay loam
		31–38	Silt loam
		38–52	Fine sandy loam
		52–80	Fine sandy loam
Earle:			
Ec	0.5–1	0–5	Clay
		[4]5–34	Silty clay
		[4]34–55	Silt loam
		[4]55–76	Silty clay
Forestdale:			
Fe, Fr	0.5–1	0–6	Silt loam
(For properties of the Routon soil in Fr, refer to the Routon series.)		6–12	Silty clay loam
		12–26	Silty clay
		26–42	Sandy loam
		42–52	Sandy loam
		52–72	Silty clay loam
Fo	0.5–1	0–6	Silty clay loam
		6–12	Silty clay loam
		12–26	Silty clay
		26–42	Sandy loam
		42–52	Sandy loam
		52–72	Silty clay loam
Hayti:			
Ha	0.5–1	0–6	Fine sandy loam
		6–10	Fine sandy loam
		10–16	Silt loam
		16–24	Loam
		24–44	Loam
		44–67	Sandy clay loam
		67–80	Sandy loam
Iberia:			
Ib	0.5–1	0–4	Clay
		4–20	Clay
		20–29	Clay
		29–38	Clay
		38–47	Silty clay
		47–54	Silt loam
		54–68	Silty clay loam
		68–75	Fine sandy loam
Jeanerette:			
Je	0.5–1	0–9	Silt loam
		9–26	Silty clay loam
		26–36	Silty clay loam
		36–42	Loam
		42–60	Fine sandy loam
		60–72	Silty clay
Morganfield:			
Mo	4–6	0–7	Fine sandy loam
		7–11	Silt loam
		[4]11–32	Silt loam
		[4]32–62	Very fine sandy loam
		[4]62–82	Very fine sandy loam

properties of soils—Continued

Classification		Percentage passing sieve—					
Unified	AASHO	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)	Permeability	Available water capacity [3]	Reaction	Shrink-swell potential
				Inches per hour	*Inches per inch of soil*	*pH*	
ML or CL	A-4 or A-6	100	70-85	0.63-2.0	.22	4.5-6.0	Low.
ML-CL or CL	A-7 or A-6	100	90-100	0.2-0.63	.21	4.5-6.0	Moderate.
CL	A-7 or A-6	100	90-100	0.2-0.63	.21	4.5-6.0	Moderate.
ML or CL	A-4 or A-6	100	75-90	0.63-2.0	.22	4.5-6.0	Low.
SM	A-2 or A-4	100	20-50	0.63-2.0	.16	4.5-6.0	Low.
SM	A-2 or A-4	100	20-50	0.63-2.0	.16	4.5-6.0	Low.
CH	A-7	100	95-100	0.06-0.2	.19	4.5-5.5	High.
CH	A-7	100	95-100	<0.06	.19	4.5-5.5	High.
CL-ML, ML or CL	A-4 or A-6	100	80-95	0.2-0.63	.22	4.5-5.5	Low.
CH	A-7	100	95-100	0.06-0.2	.19	7.9-8.4	High.
ML or CL	A-4 or A-6	100	75-90	0.63-2.0	.22	4.5-6.0	Low.
CL or CH	A-6 or A-7	100	85-100	0.2-0.63	.21	4.5-6.0	Moderate.
CL or CH	A-7 or A-6	100	90-100	<0.06	.19	4.5-6.0	High.
SM	A-2	100	20-30	2.0-6.3	.15	4.5-6.0	Low.
SM	A-2	100	20-30	2.0-6.3	.15	4.5-6.0	Low.
CL or CH	A-6 or A-7	100	85-100	0.2-0.63	.21	4.5-6.0	Moderate.
MH, CH or CL	A-7	100	90-100	0.2-0.63	.21	4.5-6.0	Moderate.
CL or CH	A-6 or A-7	100	85-100	0.2-0.63	.21	4.5-6.0	Moderate.
CL or CH	A-7 or A-6	100	90-100	<0.06	.19	4.5-6.0	High.
SM	A-2	100	20-30	2.0-6.3	.15	4.5-6.0	Low.
SM	A-2	100	20-30	2.0-6.3	.15	4.5-6.0	Low.
CL or CH	A-6 or A-7	100	85-100	0.2-0.63	.21	4.5-6.0	Moderate.
SM	A-2 or A-4	100	30-40	2.0-6.3	.15	6.1-8.4	Low.
SM	A-4	100	40-50	2.0-6.3	.15	6.1-8.4	Low.
ML or CL	A-4	100	75-85	0.63-2.0	.22	6.1-8.4	Low.
CL or ML	A-4 or A-6	100	55-65	0.2-0.63	.17	6.1-8.4	Low.
ML or CL	A-4 or A-6	100	55-65	0.2-0.63	.17	6.1-8.4	Low.
SM or CL	A-4	100	40-55	0.06-0.2	.17	6.1-8.4	Moderate.
SM	A-2	100	30-40	2.0-6.3	.14	6.1-8.4	Low.
CH	A-7	100	85-100	0.06-0.2	.19	6.1-7.8	High.
CH	A-7	100	95-100	0.06-0.2	.19	6.1-7.8	High.
CH	A-7	100	95-100	0.06	.19	6.1-7.8	High.
CH	A-7	100	95-100	0.06	.19	6.1-7.8	High.
CH	A-7	100	95-100	0.06	.19	6.1-7.8	High.
ML or CL	A-4 or A-6	100	70-90	0.2-0.63	.22	6.1-7.8	Low.
CL	A-6 or A-7	100	85-95	0.2-0.63	.21	6.1-7.8	Moderate.
SM or ML	A-4	100	40-55	0.63-2.0	.15	6.1-7.8	Low.
CL	A-4 or A-6	100	70-90	0.2-0.63	.22	6.1-7.8	Low.
CL or CH	A-6 or A-7	100	85-95	0.2-0.63	.21	6.1-7.8	Moderate.
CL or CH	A-7 or A-6	100	85-95	0.2-0.63	.21	6.1-7.8	Moderate.
CL	A-4 or A-6	100	70-85	0.2-0.63	.17	6.1-7.8	Moderate.
SM or ML	A-4	100	40-55	0.63-2.0	.15	6.1-7.8	Low.
CH	A-7	100	90-100	0.06-0.2	.19	6.1-7.8	High.
SM or ML	A-4	100	40-55	0.63-2.0	.16	6.1-7.8	Low.
ML or CL	A-4	100	70-90	0.63-2.0	.22	6.1-7.8	Low.
CL-ML, ML or CL	A-4	100	80-90	0.63-2.0	.22	6.1-7.8	Low.
ML	A-4	100	75-95	0.63-2.0	.17	6.1-7.8	Low.
ML	A-4	100	75-95	0.63-2.0	.17	7.9-8.4	Low.

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TABLE 5.—*Estimated engineering*

Soil series and map symbols	Depth to seasonal high water table[1]	Depth from surface	Classification
			Dominant USDA texture[2]
	Feet	*Inches*	
Routon:			
Rd	0.5–1	0–6	Sandy loam
(For properties of the Crevasse and Dundee soils in this unit, refer to their respective series.)		6–13	Sandy loam
		13–19	Silt loam
		19–38	Silty clay loam
		38–48	Silt loam
Sharkey:			
Sc	0–0.5	0–6	Silty clay loam
		6–34	Clay
		34–72	Clay
Sh, Sk, Sm, Sn	0–0.5	0–6	Silty clay
(For properties of the Crevasse soil in Sk and of Steele soil in Sm and Sn, refer to their respective series.)		[4]6–34	Clay
		34–72	Clay
Steele:			
So, Ss, St	1–2	0–6	Loamy sand
(For properties of the Crevasse soil in Ss and of Tunica soil in St, refer to their respective series.)		6–20	Loamy sand
		20–23	Silt loam
		23–64	Clay
		64–76	Silty clay loam
Sr	1–2	0–6	Silty clay loam
		6–20	Loamy sand
		20–23	Silt loam
		23–64	Clay
		64–76	Silty clay loam
Tiptonville:			
Td	3–4	0–8	Silt loam
(For properties of the Dubbs soil in this mapping unit, refer to the Dubbs series.)		8–18	Silt loam
		18–27	Loam
		27–52	Fine sandy loam
		52–72	Fine sandy loam
Tunica:			
Tu	0–0.5	0–8	Silty clay
		[4]8–24	Clay
		24–45	Silty clay loam
		[4]45–72	Silt loam

[1] The water table is highest in winter.
[2] These determinations were made in the field.
[3] The values shown are midpoint in range.

changes. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. In general, clayey soils have a high shrink-swell potential and are likely to be risky if used for engineering structures.

Engineering interpretations of soils

Table 6 gives information useful to engineers and others who plan to use soil material for building highways, and it also gives the soil features that affect other kinds of engineering work. Most of the features shown are unfavorable, but important favorable features also may be shown. The interpretations pertain only to the soil depths given in table 5. They are based on the test data in table 4, the engineering properties estimated in table 5, and on field experience. Borrow pits and Alluvial land are not listed in table 6, because their properties are variable.

Topsoil is fertile material, ordinarily rich in organic matter, that is used to topdress roadbanks, lawns, and gardens. Suitability of soils for topsoil is rated as *good, fair,* or *poor.*

Road fill is material used for building embankments. The soil material used for this purpose has been moved from borrow areas. Some soils in Mississippi County are fair sources of commercial sand, but the ratings do not indicate kinds or size of the deposits.

Also in table 6 are shown the soil features, especially unfavorable ones, that affect winter grading. Among features considered are those related to moving, mixing, and compacting soil in road building when temper-

properties of soils—Continued

Classification		Percentage passing sieve—		Permeability	Available water capacity [3]	Reaction	Shrink-swell potential
Unified	AASHO	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
				Inches per hour	*Inches per inch of soil*	*pH*	
SM	A-2	100	30-40	0.63-2.0	.15	5.6-7.3	Low.
SM	A-4 or A-2	100	35-50	0.63-2.0	.15	5.6-7.3	Low.
ML or CL	A-4 or A-6	100	70-90	0.2-0.63	.22	5.6-7.3	Low.
CL or CH	A-6 or A-7	100	85-95	0.06-0.2	.21	5.6-7.3	Moderate.
ML or CL	A-4	100	70-90	0.2-0.63	.22	5.6-7.3	Low.
CH or CL	A-6	100	90-95	0.06-0.2	.12	6.1-8.4	Moderate.
CH	A-7	100	95-100	<0.06	.19	6.1-8.4	High.
CH	A-7	100	95-100	<0.06	.19	6.1-8.4	High.
CH	A-7	100	95-100	<0.06	.19	6.1-8.4	High.
CH	A-7	100	95-100	<0.06	.19	6.1-8.4	High.
CH	A-7	100	95-100	<0.06	.19	6.1-8.4	High.
SM	A-2	100	15-25	2.0-6.3	.08	6.1-8.4	Low.
SM-SP or SM	A-2	100	5-25	> 6.3	.08	6.1-8.4	Low.
ML or CL	A-4	100	80-90	0.2-0.63	.22	6.1-8.4	Low.
CH	A-7	100	95-100	0.06-0.2	.19	6.1-8.4	High.
CL or CH	A-6 or A-7	100	90-95	0.2-0.63	.21	6.1-8.4	
CL	A-6	100	80-90	0.2-0.63	.21	6.1-8.4	Moderate.
SM	A-2	100	15-25	> 6.3	.08	6.1-8.4	Low.
ML or CL	A-4	100	80-90	0.2-0.63	.22	6.1-8.4	Low.
CH	A-7	100	95-100	0.06-0.2	.19	6.1-8.4	High.
CL or CH	A-6 or A-7	100	90-95	0.2-0.63	.21	6.1-8.4	Moderate.
ML or CL	A-4	100	80-90	0.63-2.0	.22	5.1-6.5	Low.
ML or CL	A-4 or A-6	100	80-90	0.63-2.0	.22	5.1-6.5	Low.
ML	A-4	100	65-85	0.2-0.63	.17	5.1-6.5	Low.
SM or ML	A-4	100	40-60	0.63-2.0	.16	5.1-6.5	Low.
SM or ML	A-4	100	40-60	0.63-2.0	.16	5.1-6.5	Low.
CH	A-7	100	95-100	0.06-0.2	.19	6.1-8.4	High.
CH	A-7	100	95-100	<0.06	.19	6.1-8.4	High.
CL	A-6	100	95-100	0.2-0.63	.21	6.1-8.4	Moderate.
ML or CL	A-4 or A-6	100	90-95	0.2-0.63	.22	6.1-8.4	Low.

[4] On these horizons, the Arkansas State Highway Department performed tests in cooperation with U.S. Department of Commerce, Bureau of Public Roads.

atures are below freezing. Adaptability of soils in wet weather is the same as that for grading in winter.

Agricultural drainage is essential before many soils on bottom lands are used for farming. These soils are poorly drained because of a slowly permeable or very slowly permeable layer.

Suitability of soils for sewage lagoons is rated chiefly by such soil features as slope and permeability. Most soils in the county have only slight or moderate limitations when used for sewage lagoons.

Soil features affecting highway location are mainly those of the undisturbed soil material. Among these features are traffic-supporting capacity, shrink-swell potential, and a high water table.

During part of the growing season, irrigation is beneficial to many soils in the county. Water for irrigation is stored in reservoirs or is obtained from wells and small streams. Several methods of irrigation can be used, including furrow, contour levee, and sprinkler. Surface methods are suited to the moderately to very slowly permeable soils, and sprinkler methods to the highly permeable soils.

Dikes and levees are low structures for impounding or diverting water. The soil features named are mainly unfavorable ones that affect use of the soil as material for building low dikes and levees.

Land leveling is the reshaping of the soil surface by removing knolls, mounds, and ridges and by filling swales, potholes, and gullies. It improves surface drainage and insures uniform spread of irrigation water.

TABLE 6.—*Engineering*

[Alluvial land (Ad) and Borrow pits (Bp) have properties

Soil series and map symbol	Suitability as source of— Topsoil	Road fill	Sand	Winter grading
Alligator: Aa	Poor	Poor	Unsuitable	Poorly drained soils; high clay content; seasonal high water table.
Amagon: An	Fair	Fair	Poor to unsuitable	Poorly drained soils; seasonal high water table.
Bowdre: Br	Poor; good below 17 inches.	Poor; fair below 17 inches.	Poor	Moderately well drained soils; frequent floods in some areas.
Bruno: Bv For properties of Crevasse soil in Bv, see the Crevasse series.	Poor	Good	Fair to good	Soil features favorable.
Commerce: Cm	Good	Fair	Poor	Somewhat poorly drained soils; seasonal high water table; some areas frequently flooded.
Convent: Cn	Good	Fair	Poor	Somewhat poorly drained soils; seasonal high water table; frequent floods in some areas.
Crevasse: Cr	Poor	Good	Fair to good	Excessively drained soils; some areas frequently flooded.
Crowley: Cw	Fair to poor	Poor	Unsuitable	Poorly drained soils; seasonal high water table.
Dubbs Mapped only in complex Dv and in an undifferentiated unit Td.	Good	Good	Poor	Seasonal high water table; some areas frequently flooded.
Dundee: Du, Dv For properties of Dubbs and Crevasse soils in Dv, see their respective series.	Good	Fair	Poor	Somewhat poorly drained soils; seasonal high water table; some areas frequently flooded.

interpretations of soils

too variable to rate and are not included in this table]

Soil features affecting suitability for—					
Agriculture drainage	Sewage lagoons	Highway location	Irrigation	Dikes and levees	Land leveling
Poorly drained soils; very slow permeability.	All soil features favorable.	Poor traffic-supporting capacity; high shrink-swell potential; high water table.	Very slow intake rate; high available water capacity.	Low strength and stability; high shrink-swell potential; high compressibility.	Soil features favorable.
Poorly drained soils; slow permeability.	Soil features favorable.	Poor traffic-supporting capacity; high water table.	Slow intake rate; high available water capacity.	Moderate shrink-swell potential; moderate compressibility; subject to piping.	Soil features favorable.
Moderately well drained soils; some areas frequently flooded.	High seepage rate; thin clayey layer; sand below depth of 17 inches in places; some areas frequently flooded.	Poor traffic-supporting capacity; moderate to high shrink-swell potential; high water table; some areas frequently flooded.	Slow intake rate; high available water capacity; some areas frequently flooded.	Moderate to high shrink-swell potential in upper part; moderate strength and stability throughout profile; subsoil subject to piping.	Soil features favorable; some areas frequently flooded.
Excessively drained soils.	High seepage rate; high sand content.	Good traffic-supporting capacity; good stability.	High intake rate; low available water capacity.	Low strength and stability; subject to piping and erosion; rapid permeability.	Soil features favorable.
Somewhat poorly drained soils; some areas frequently flooded.	Moderate to low seepage rate; some areas frequently flooded.	Fair traffic-supporting capacity; high water table; some areas frequently flooded.	Moderate to slow intake rate; high available water capacity; some areas frequently flooded.	Moderate to low shrink-swell potential; moderate strength and stability; subject to piping.	Soil features favorable; some areas frequently flooded.
Somewhat poorly drained soils; frequent floods in some areas.	Moderate seepage rate; some areas frequently flooded.	Fair traffic-supporting capacity; high water table; some areas frequently flooded.	Moderate intake rate; high available water capacity; some areas frequently flooded.	Subject to piping; moderate strength and stability.	Soil features favorable; some areas frequently flooded.
Excessively drained soils; some areas frequently flooded.	High seepage rate; high sand content; some areas frequently flooded.	Good traffic-supporting capacity; fair stability; some areas frequently flooded.	High intake rate; low availble water capacity; some areas frequently flooded.	Subject to piping; low strength and stability; rapid permeability.	Soil features favorable; some areas frequently flooded.
Poorly drained soils; very slow permeability.	Soil features favorable.	Fair to poor traffic-supporting capacity.	Slow to very slow intake rate; high available water capacity.	Low strength and stability; part of profile subject to piping; part has high shrink-swell potential.	Soil features favorable.
Moderately well drained and well drained soils; some areas frequently flooded.	Moderate to high seepage rate; sandy below depth of 40 inches; frequent floods in some places.	Fair traffic-supporting capacity; some areas frequently flooded.	Moderate intake rate; high available water capacity; some areas frequently flooded.	Subject to piping; moderate to rapid permeability below a depth of 40 inches.	Soil features favorable; frequent flooding in some areas.
Somewhat poorly drained soils; moderately slow permeability; some areas frequently flooded.	Moderately slow seepage rate; frequent floods in some areas.	Fair traffic-supporting capacity; some areas frequently flooded.	Moderately slow intake rate; high available water capacity; some areas frequently flooded.	Subject to piping and erosion in material below a depth of 3 feet.	Soil features favorable; frequent flooding in some areas.

TABLE 6.—*Engineering interpretations*

Soil series and map symbol	Suitability as source of—			
	Topsoil	Road fill	Sand	Winter grading
Earle: Ec	Poor	Poor	Unsuitable	Somewhat poorly drained soils; high clay content; seasonal high water table.
Forestdale: Fe, Fo, Fr For properties of Routon soil in Fr, see the Routon series.	Poor	Poor	Poor	Poorly drained soils; seasonal high water table.
Hayti: Ha	Fair	Poor to fair	Poor	Poorly drained soils; seasonal high water table; some areas frequently flooded.
Iberia: Ib	Poor	Poor	Unsuitable	Poorly drained soils; high clay content; seasonal high water table.
Jeanerette: Je	Fair	Fair	Poor	Poorly drained soils; seasonal high water table; some areas frequently flooded.
Morganfield: Mo	Good	Fair	Poor	Well-drained soils; seasonal high water table; some areas frequently flooded.
Routon: Rd For properties of Dundee and Crevasse soils in Rd, see their respective series.	Fair	Fair	Poor	Poorly drained soils; seasonal high water table; some areas frequently flooded.
Sharkey: Sc, Sh, Sk, Sm, Sn For properties of Crevasse soil in Sk and of Steele soil in Sm and Sn, see their respective series.	Poor	Poor	Unsuitable	Poorly drained soils; high clay content; high water table; some areas frequently flooded.
Steele: So, Sr, Ss, St For properties of Crevasse soil in Ss and of Tunica soil is St, see their respective series.	Poor to fair in surface layer only.	Poor	Poor to good in upper 20 to 30 inches.	Moderately well drained soils; seasonal high water table; some areas frequently flooded.

of soils—Continued

Soil features affecting suitability for—					
Agriculture drainage	Sewage lagoons	Highway location	Irrigation	Dikes and levees	Land leveling
Somewhat poorly drained soils; very slow permeability.	Soil features favorable.	High shrink-swell potential; poor traffic-supporting capacity.	Very slow intake rate; high available water capacity.	Low strength and stability; high shrink-swell potential; high compressibility in upper 2 to 3 feet and below 5 feet; material between 2 to 3 feet and 5 feet subject to piping; sandy below 3 feet in places.	Soil features favorable.
Poorly drained soils; very slow permeability.	Moderate seepage rate in loamy material below depth of 26 inches in places.	Poor traffic-supporting capacity.	Slow to very slow intake rate; high available water capacity.	Moderate to high shrink-well potential; high compressibility in upper 2 feet; subject to piping below 2 feet.	Soil features favorable.
Poorly drained soils; high water table; slow permeability; some areas frequently flooded.	Sandy material in the upper 10 inches and below depth of 44 inches; slow to moderate seepage rate; some areas frequently flooded.	Poor traffic-supporting capacity; some areas frequently flooded.	Moderate to slow intake rate; high available water capacity; some areas frequently flooded.	Stratified material; no limiting features if well mixed and compacted.	Soil features favorable; some areas frequently flooded.
Poorly drained soils; very slow permeability.	All soil features favorable.	Poor traffic-supporting capacity; high shrink-swell potential.	Very slow intake rate; high available water capacity.	High shrink-swell potential; low strength and stability; high compressibility.	Soil features favorable.
Poorly drained soils; some areas frequently flooded.	Loamy material with moderate seepage rate below depth of 42 inches; some areas frequently flooded.	Fair traffic-supporting capacity; some areas frequently flooded.	Moderate to slow intake rate; high available water capacity; frequent floods in some areas.	Moderate shrink-swell potential; moderate compressibility.	Soil features favorable; some areas frequently flooded.
Well-drained soils; some areas frequently flooded.	Moderate seepage rate; sand below depth of 32 inches; some areas frequently flooded.	Fair traffic-supporting capacity; some areas frequently flooded.	Moderate intake rate; moderate to high available water capacity; frequent floods in some areas.	Moderate compressibility subject to piping; low strength and stability.	Soil features favorable; some areas frequently flooded.
Poorly drained soils; slow permeability; some areas frequently flooded.	Moderately slow to slow seepage rate; some areas frequently flooded.	Fair traffic-supporting capacity; some areas frequently flooded.	Moderate to slow intake rate; high available water capacity; some areas frequently flooded.	Moderate compressibility; subject to piping; moderate shrink-swell potential in some layers.	Soil features favorable; some areas frequently flooded.
Poorly drained soils; very slow permeability; high water table; some areas frequently flooded.	All soil features favorable; some areas frequently flooded.	Poor traffic-supporting capacity; high shrink-swell potential; some areas flooded frequently.	Very slow intake rate; high available water capacity; some areas frequently flooded.	Low strength and stability; high shrink-swell potential; high compressibility.	Soil features favorable; some areas frequently flooded.
Moderately well drained soils; very slow permeability; some areas frequently flooded.	Loamy and sandy material in upper part; clay below depth of 20 to 36 inches; some areas frequently flooded.	Fair traffic-supporting capacity; some areas frequently flooded.	Moderately slow to rapid intake rate; moderate available water capacity; some areas frequently flooded.	Low strength and stability in upper 20 to 30 inches; high shrink-swell potential below 2 feet.	Soil features favorable; some areas frequently flooded.

TABLE 6.—*Engineering interpretations*

Soil series and map symbol	Suitability as source of—			
	Topsoil	Road fill	Sand	Winter grading
Tiptonville: Td. For properties of Dubbs soil in Td, see the Dubb series.	Good	Fair	Poor	Moderately well drained soils; seasonal high water table.
Tunica: Tu	Poor	Poor	Unsuitable	Poorly drained soils; high clay content; seasonal high water table; frequent floods in some areas.

Nonfarm Uses of Soils

The same basic soil classification that is significant to farming may also be used in predicting the behavior of soils when they are used for residential developments, industrial plants, and recreational areas.

The soils in Mississippi County are highly contrasting and vary widely in the degree of limitations to use for nonfarm purposes. The topography is generally level, and run-off accumulates in depressions and in broad flat areas. Problems of varying intensity occur when the soils are put to various uses, since in some places excess water remains on the surface and within the soil for long periods.

Mississippi County has wide areas of sediments laid down by slack water. These sediments contain large amounts of clay, which swells when it gets wet and shrinks as it dries. Because of this clay content, the soils are unstable and limitations to use for community developments are severe. Instability of roadbeds and building foundations, as well as improper performance of septic tank filter fields, is directly related to local accumulations of runoff and slow movement of water through the soils. Sharkey and Alligator are examples of clayey soils.

In table 7 the soils are rated according to their degree and kind of limitations if used for selected nonfarm purposes. Generally, the soils most suitable for farming, such as Dubbs and Tiptonville, are equally well suited to the nonfarm uses.

In table 7 the degree of limitation is rated *slight, moderate, severe,* or *very severe*. The ratings reflect the features of a given soil to a depth of 5 feet that affect a potential nonfarm use. *Slight* indicates that the limitation is not serious and is easily overcome; *moderate* that the limitation generally can be corrected by practical means; *severe* means that the limitation is difficult or impractical to overcome; and *very severe* means that the use of the soil for a particular purpose is not practical.

Features that are significant in determining the limitations of soils used for nonfarm purposes are drainage, percolation rate, water table, shrink-swell potential, bearing value, traffic-supporting capacity, trafficability, and hazard of flooding.

Drainage is the natural drainage under which the soil developed.

The percolation rate for a given soil is suitable for septic tank filter fields if the rate is faster than 1 inch of water moving through saturated soil in 60 minutes. Limitations are moderate on soils that have a percolation rate of 1 inch of water in 60 to 90 minutes and are very severe when the time is more than 90 minutes.

The water table is the upper surface of free water in the soil or underlying material. In some places the table is perched; that is, separated from a lower water table by a dry zone. Both the depth to the water table and the length of time the table remains at that depth are considered.

Shrink-swell potential is the potential change in volume with change in moisture content; that is, the extent to which the soil shrinks when dry and swells when wet. Shrink-swell potential is influenced by the amount and kind of clay in the soil. Damage to buildings is often caused by the shrinking and swelling of the soil after construction.

Bearing values are based on estimates of the maximum load for a specific soil material when compacted. They are used in building codes to determine soil stability for building foundations. The ratings given for bearing capacity are estimates and should not be assigned specific values.

Traffic-supporting capacity is the ability of the undisturbed soil to support moving loads. It indicates the suitability of soil as subgrade material.

The trafficability of a soil is determined by the ease with which people can move about on foot or in small vehicles. Limitations are slight for loamy soils that have a water table below a depth of 30 inches during periods of heavy use and that are not subject to flooding. Clayey soils have severe limitations.

For dwellings, the degree of limitation depends on percolation rate, stability, flood hazard, natural wetness, depth to water table, and suitability for lawn grasses, shrubs, and trees. If percolation is adequate for the disposal of the septic tank effluent, the limita-

of soils—Continued

Soil features affecting suitability for—					
Agriculture drainage	Sewage lagoons	Highway location	Irrigation	Dikes and levees	Land leveling
Moderately well drained soils; moderate permeability.	Moderate seepage rate.	Fair traffic-supporting capacity.	Moderate intake rate; high available water capacity.	Moderate compressibility; low strength and stability; subject to piping and erosion.	Soil features favorable.
Poorly drained soils; very slow permeability; frequent floods in some areas.	Soil features favorable; frequent floods in some areas.	Poor traffic-supporting capacity; frequent floods in some areas.	Very slow intake rate; high available water capacity; frequent floods in some areas.	Low strength and stability; high compressibility; high shrink-swell potential in upper 2 feet.	Soil features favorable; some areas frequently flooded.

tion is the same for dwellings served by sewerage systems as for those that require septic tanks.

The degree of limitation for use as picnic sites, campsites, and playgrounds depends on productivity, wetness, flood hazard, and trafficability.

The limitation for light industrial use applies to structures of less than three stories. The degree of limitation depends on bearing value, shrink-swell potential, depth to water table, flood hazard, and natural drainage.

The soil limitation of flood hazard is based on frequency and duration of flooding, especially during the season of use. Even a slight hazard of flooding greatly limits use of a soil as a site for dwellings and other buildings and for highways.

Information in this subsection is intended only as a guide for planning nonfarm uses of soils because most mapping units include areas of more than one kind of soil. Thus, an area designated as Morganfield fine sandy loam may consist of as much as 15 percent of another kind of soil. The included soil may have different characteristics from those of the soil that gave the mapping unit its name. Limitations of Morganfield fine sandy loam, for example, are moderate for homes or small lots that require septic tanks for sewage disposal, though areas mapped as this Morganfield soil may include some Commerce silt loam. Limitations of the Commerce soil for septic tank filter fields are severe because the subsoil of this soil has higher clay content than in Morganfield fine sandy loam and the water table is higher. The subsoil slows percolation of water and septic tank effluent. In wet seasons, when the water table is high, the effluent may be brought to the surface, and it can become hazardous to community health. Because of variations, such as those within the mapping unit, onsite investigation is necessary before building or other construction sites are finally located.

Formation, Classification, and Morphology of Soils

In this section the factors that affect soil formation in Mississippi County and the processes of horizon differentiation are discussed. Then, the current system of soil classification is explained and the soil series are placed in some of the categories of that system. The soil series in the county, including a profile representative of each series, are described in the section "Descriptions of the Soils."

Factors of Soil Formation

Soil is formed by weathering and other processes that act upon the soil. The characteristics of the soil at any given point depend on (1) climate, (2) living organisms, (3) parent material, (4) relief, and (5) time. Each factor acts on the soil and modifies the effect of the other four. When climate, living organisms, or any other one of the five factors is varied to a significant extent, a different soil may be formed *(13)*.

Climate and living organisms are the active forces in soil formation. Relief modifies the effects of climate and living organisms, mainly by its influence on temperature and runoff. Because climate, vegetation, parent material, and relief interact over a period of time, time is the fifth factor of soil formation. The effect of time is also reflected in the soil characteristics.

The interaction of the five factors of soil formation is more complex for some soils than for others. For example, in places where the environment has changed, the characteristics of a young soil have been superimposed on those of an older soil.

The five factors that affect soil formation are discussed in the following paragraphs.

Climate [5]

The climate in Mississippi County is characterized by warm summers and mild winters. The warm temperature and high precipitation probably are similar to the climate under which the soils in the county formed. The average daily maximum temperature at Osceola in July is 81.3° F. and the average in January is 40.9°. The average annual temperature is about 61.1°. The total annual rainfall is about 47.5 inches, about half of which falls in 5 months, December through April *(14)*. For

[5] Data on climate compiled by the U.S. Weather Bureau Station at Osceola, Mississippi County, Ark.

TABLE 7.—*Degree and kinds of limitations to use of soils*

Soil series and map symbol	Drainage	Dwellings served by public or community sewage system	Dwellings served by septic tank filter fields
Alligator: Aa	Poor	Severe: wetness; low bearing value; high shrink-swell potential; occasional flooding.	Severe: very slow percolation rate; wetness; low bearing value; high shrink-swell potential; seasonal high water table; occasional flooding.
Amagon: An	Poor	Severe: wetness; moderate bearing value; moderate shrink-swell potential; occasional flooding.	Severe: slow percolation rate; wetness; low bearing value; moderate shrink-swell potential; seasonal high water table; occasional flooding.
Bowdre: Br[1]	Moderately good	Severe: high shrink-swell potential in upper clayey part; no flood hazard.	Severe: high shrink-swell potential in upper clayey part; seasonal water table; no flood hazard.
Bruno: Bv For limitations of Crevasse soil in this mapping unit, refer to the Crevasse series.	Excessive	Slight to moderate: not subject to flooding; grass and shrubs difficult to maintain.	Slight to moderate: not subject to flooding; grass and shrubs difficult to maintain.
Commerce: Cm	Somewhat poor	Slight to moderate: seasonal high water table; not subject to flooding.	Severe: seasonal high water table; moderately slow percolation; not subject to flooding.
Convent: Cn[1]	Somewhat poor	Slight to moderate: seasonal high water table; no flood hazard.	Moderate to severe: seasonal high water table; no flood hazard.
Crevasse: Cr[1]	Excessive	Slight to moderate: difficult to maintain grass and shrubs; no flood hazard.	Slight to moderate: difficult to maintain grass and shrubs; not subject to flooding.
Crowley: Cw	Poor	Severe: wetness; moderate to low bearing value; moderate to high shrink-swell potential; seasonal high water table; no flood hazard.	Severe: wetness; very slow percolation; moderate to low bearing value; moderate to high shrink-swell potential; seasonal high water table; no flood hazard.
Dubbs[1] Mapped only in a complex and in an undifferentiated unit.	Moderately good and good.	Slight: no flood hazard	Moderate: moderate to moderately slow percolation rate; seasonal high water table; no flood hazard.
Dundee: Du, Dv[1] For limitations of Dubbs and Crevasse soils in Dv, refer to their respective series.	Somewhat poor	Moderate: seasonal high water table; moderate to low shrink-swell potential; not subject to flooding.	Severe: seasonal high water table; moderately slow percolation rate; low to moderate shrink-swell potential; not subject to flooding.
Earle: Ec	Somewhat poor	Severe: low bearing value; seasonal high water table; high shrink-swell potential; not subject to flooding.	Severe: low bearing value; seasonal high water table; high shrink-swell potential; very slow percolation rate; no flood hazard.
Forestdale: Fe, Fo, Fr For limitations of the Routon soil in mapping unit Fr, refer to the Routon series.	Poor	Severe: wetness; low bearing value; moderate to high shrink-swell potential; seasonal high water table;	Severe: very slow to slow percolation rate; wetness; low to moderate bearing value; moderate to high shrink-swell potential; seasonal high water table.

for building sites, recreational facilities, and trafficways

Recreation			Light industry	Trafficways
Campsites	Picnic areas	Intensive play areas		
Severe: seasonal high water table; poor trafficability; occasional flooding; wetness.	Severe: seasonal high water table; poor trafficability; occasional flooding; wetness.	Severe: seasonal high water table; poor trafficability; occasional flooding; wetness.	Severe: low bearing value; high shrink-swell potential; seasonal high water table; wetness; occasional flooding.	Severe: poor traffic-supporting capacity; seasonal high water table; occasional flooding.
Severe: fair trafficability; seasonal high water table; occasional flooding; wetness.	Severe: fair trafficability; seasonal high water table; occasional flooding; wetness.	Severe: fair trafficability; seasonal high water table; occasional flooding; wetness.	Severe: low bearing value; moderate shrink-swell potential; seasonal high water table; occasional flooding; wetness.	Severe: poor traffic-supporting capacity; seasonal high water table; occasional flooding.
Severe: poor trafficability; not subject to flooding.	Severe: poor trafficability; not subject to flooding.	Severe: poor trafficability; not subject to flooding.	Moderate: moderate bearing value; high shrink-swell potential in upper clayey part; not subject to flooding.	Severe: poor traffic-supporting capacity; seasonal high water table; not subject to flooding.
Moderate: fair trafficability; not subject to flooding.	Moderate: fair trafficability; not subject to flooding.	Moderate: fair trafficability; not subject to flooding.	Slight: not subject to flooding.	Slight: not subject to flooding.
Moderate: seasonal high water table; not subject to flooding.	Moderate: seasonal high water table; not subject to flooding.	Moderate: seasonal high water table; not subject to flooding.	Moderate: moderate bearing value; seasonal high water table; not subject to flooding.	Moderate: fair traffic-supporting capacity; seasonal high water table; not subject to flooding.
Slight to moderate: seasonal high water table; not subject to flooding.	Slight to moderate: seasonal high water table; not subject to flooding.	Slight to moderate: seasonal high water table; not subject to flooding.	Moderate: moderate bearing value; seasonal high water table; not subject to flooding.	Moderate: fair traffic-supporting capacity; seasonal high water table; no flood hazard.
Moderate: fair trafficability; moderate soil blowing in winter and spring unless vegetated; no flood hazard.	Moderate: fair trafficability; moderate soil blowing in winter and spring unless vegetated; no flood hazard.	Moderate: moderate soil blowing in winter and spring unless vegetated; fair trafficability; no flood hazard.	Slight: moderate soil blowing in winter and spring unless vegetated; no flood hazard.	Slight: not subject to flooding.
Moderate to severe: fair trafficability; wetness; seasonal high water table; not subject to flooding.	Moderate to severe: fair trafficability; wetness; seasonal high water table; not subject to flooding.	Moderate to severe: fair trafficability; wetness; seasonal high water table; not subject to flooding.	Severe: low bearing value; seasonal high water table; moderate to high shrink-swell potential; no flood hazard.	Severe: fair to poor traffic-supporting capacity; seasonal high water table; not subject to flooding.
Slight: not subject to flooding.	Slight: not subject to flooding.	Slight: not subject to flooding.	Moderate: moderate bearing capacity; low to moderate shrink-swell potential; no flood hazard.	Moderate: fair traffic-supporting capacity; not subject to flooding.
Moderate: fair trafficability; seasonal high water table; no flood hazard.	Moderate: fair trafficability; no flood hazard.	Moderate: fair trafficability; no flood hazard.	Moderate: seasonal high water table; moderate bearing value; low to moderate shrink-well potential; not subject to flooding.	Moderate: seasonal high water table; fair traffic-supporting capacity; not subject to flooding.
Severe: poor trafficability; seasonal high water table; no flood hazard.	Severe: poor trafficability; seasonal high water table; no flood hazard.	Severe: poor trafficability; seasonal high water table; no flood hazard.	Severe: seasonal high water table; high shrink-swell potential; low bearing value; not subject to flooding.	Severe: seasonal high water table; poor trafficability; no flood hazard.
Severe: wetness; poor trafficability; seasonal high water table.	Severe: wetness; poor trafficability; seasonal high water table.	Severe: wetness; poor trafficability; seasonal high water table.	Severe: seasonal high water table; low bearing value; moderate to high shrink-swell potential; wetness.	Severe: seasonal high water table; poor traffic-supporting capacity.

TABLE 7.—*Degree and kinds of limitations to use of soils for building*

Soil series and map symbol	Drainage	Dwellings served by public or community sewage system	Dwellings served by septic tank filter fields
Hayti: Ha	Poor	Severe: wetness; low bearing value; moderate shrink-swell potential; seasonal high water table; occasional flooding.	Severe: low bearing value; wetness; slow percolation rate; low to moderate shrink-swell potential; seasonal high water table; occasional flooding.
Iberia: Ib	Poor	Severe: wetness; low bearing value; high shrink-swell potential; seasonal high water table.	Severe: very slow percolation rate; wetness; low bearing value; high shrink-swell potential; seasonal high water table; occasional flooding.
Jeanerette: Je [1]	Poor	Severe: wetness; low bearing value; high water table; moderate shrink-swell potential; no flood hazard.	Severe: wetness; low bearing value; seasonal high water table; moderate shrink-swell potential; slow percolation rate; not subject to flooding.
Morganfield: Mo [1]	Good	Moderate: moderate bearing value; no flood hazard.	Moderate: moderate bearing value; no flood hazard.
Routon: Rd [1] For limitations of Dundee and Crevasse soils in this mapping unit, refer to the Dundee and Crevasse series, respectively.	Poor	Severe: wetness; low bearing value; seasonal high water table; flooded occasionally.	Severe: very slow percolation rate; low bearing value; seasonal high water table; occasional flooding.
Sharkey: Sc, Sh, Sk, Sm, Sn [1] For limitations of the Crevasse soil in Sk, and of the Steele soil in Sm and Sn, refer to the Crevasse and Steele series, respectively.	Poor	Severe: low bearing value; high shrink-swell potential; seasonal high water table; occasional flooding; wetness.	Severe: very slow percolation; low bearing value; high shrink-swell potential; seasonal high water table; occasional flooding; wetness.
Steele: So, Sr, Ss, St [1] For limitations of the Crevasse soil in Ss, and of the Tunica soil in St, refer to the Crevasse and Tunica series, respectively.	Moderately good	Severe: low bearing value; high shrink-swell potential in lower part; seasonal high water table; occasional flooding.	Severe: very slow percolation; low bearing value; high shrink-swell potential in lower part; seasonal high water table; occasional flooding.
Tiptonville: Td For limitations of Dubbs soil in this mapping unit, refer to the Dubbs series.	Moderately good	Moderate: moderate bearing value.	Moderate: moderate bearing value.
Tunica: Tu [1]	Poor	Severe: low bearing value; high shrink-swell potential; seasonal high water table; wetness.	Severe: very slow percolation; wetness; low bearing value; high shrink-swell potential; seasonal high water table.

[1] Some areas are subject to frequent flooding and have very severe limitations for all uses listed in table.

sites, recreational facilities, and trafficways—Continued

Recreation			Light industry	Trafficways
Campsites	Picnic areas	Intensive play areas		
Severe: wetness; seasonal high water table; poor trafficability; occasional flooding.	Severe: poor trafficability; wetness; high water table; occasional flooding.	Severe: poor trafficability; wetness; high water table; occasional flooding.	Severe: seasonal high water table; low bearing value; occasional flooding; wetness.	Severe: seasonal high water table; occasional flooding; poor traffic-supporting capacity.
Severe: wetness; seasonal high water table; poor trafficability; occasional flooding.	Severe: poor trafficability; wetness; seasonal high water table; occasional flooding.	Severe: poor trafficability; wetness; seasonal high water table; occasional flooding.	Severe: seasonal high water table; low bearing value; high shrink-swell potential; occasional flooding; wetness.	Severe: seasonal high water table; occasional flooding; poor traffic-supporting capacity.
Severe: wetness; seasonal high water table; poor trafficability; not subject to flooding.	Severe: poor trafficability; wetness; seasonal high water table; not subject to flooding.	Severe: poor trafficability; wetness; seasonal high water table; not subject to flooding.	Severe: seasonal high water table; moderate shrink-swell potential; low bearing value; wetness; not subject to flooding.	Severe: seasonal high water table; not subject to flooding; poor to fair traffic-supporting capacity.
Slight: not subject to flooding.	Slight: not subject to flooding.	Slight: not subject to flooding.	Moderate: moderate bearing value; not subject to flooding.	Moderate: fair traffic-supporting capacity; not subject to flooding.
Severe: wetness; seasonal high water table; poor trafficability; occasional flooding.	Severe: poor trafficability; wetness; seasonal high water table; occasional flooding.	Severe: poor trafficability; wetness; seasonal high water table; occasional flooding.	Severe: seasonal high water table; low bearing value; wetness; occasional flooding.	Severe: poor traffic-supporting capacity; table; occasional flooding.
Severe: poor trafficability; wetness; seasonal high water table; occasional flooding.	Severe: poor trafficability; wetness; seasonal high water table; occasional flooding.	Severe: poor trafficability; wetness; seasonal high water table; occasional flooding.	Severe: seasonal high water table; low bearing value; high shrink-swell potential; occasional flooding; wetness.	Severe: seasonal high water table; poor traffic-supporting capacity; occasional flooding.
Severe: fair to poor trafficability; occasional flooding.	Severe: fair to poor trafficability; occasional flooding.	Severe: fair to poor trafficability; occasional flooding.	Severe: seasonal high water table; low bearing value; high shrink-swell potential; occasional flooding.	Severe: seasonal high water table; poor traffic-supporting capacity; occasional flooding.
Slight	Slight	Slight	Moderate: moderate bearing value.	Moderate: fair traffic-supporting capacity.
Severe: poor trafficability; wetness; seasonal high water table.	Severe: poor trafficability; wetness; seasonal high water table.	Severe: poor trafficability; wetness; seasonal high water table.	Severe: seasonal high water table; low bearing value; high shrink-swell potential; wetness.	Severe: seasonal high water table; poor traffic-supporting capacity.

additional information on climate, refer to the section "General Nature of the County."

The warm, moist climate promotes rapid soil formation, and the warm temperature allows rapid chemical reactions. The large amount of available water that moves through the soil is instrumental in removing dissolved or suspended materials. Because remains of plants decompose rapidly, the organic acids thus formed hasten the formation of clay minerals and removal of carbonates. Because the soil is frozen for only short periods, soil formation continues almost the year round. The climate throughout the county is uniform, though its effect is modified locally by runoff. Climate alone does not account for the formation of different kinds of soils in the county.

Living organisms

The higher plants and animals, as well as insects, bacteria, and fungi, are important in the formation of soils. Among the changes they cause are gains in organic matter and nitrogen in the soil, gains or losses in plant nutrients, and changes in structure and porosity.

Before Mississippi County was settled, the native vegetation had more influence on soil formation than did animal activity. Hardwood forests, broken by a few canebrakes, covered the county. Dense stands of bald cypress filled the swampy areas, whereas hardwoods covered most of the loamy and sandy Bruno, Convent, Crevasse, Dubbs, Tiptonville, and other somewhat poorly drained to excessively drained soils. Many of the wetter soils, such as the Amagon and Forestdale, also were covered by hardwoods. The trees growing at the higher elevations were chiefly hickory, pecan, white oak, post oak, red oak, blackgum, and winged elm. In the swales and low places that were wet but not swampy, most of the trees were water tupelo, sweetgum, soft elm, green ash, hackberry, cottonwood, overcup oak, and willow oak. Here, the Alligator, Sharkey, Earle, Iberia, Jeanerette, Steele, and Tunica soils formed. The Bowdre and Dundee soils formed in canebrakes that covered many of the flats between the swamps and the sloughs and bayous.

These differences in native vegetation seem to have been related to variations in drainage. Only the major differences in the original vegetation are reflected to any extent by the characteristics of the soils.

Man is important to the future rate of soil formation because he clears the forest, cultivates the soils, and introduces new kinds of plants. Building levees for flood control and improving drainage also affect the future development of soils. Some results of these changes will not be evident for many centuries. Nevertheless, the complex of living organisms affecting soil formation in this county has been drastically changed because of man.

Parent material

The soils of Mississippi County are derived from parent materials deposited during recent geological time. The materials were deposited by the Mississippi and Ohio Rivers and in part reworked by local tributaries of the Mississippi River *(5)*.

The alluvium along the lower parts of the Mississippi River consists of a mixture of material washed from the many kinds of soils, rocks, and unconsolidated sediments in about 24 States *(17)*. Because it comes from the wide areas of the basin of the upper Mississippi River, the alluvium is mixed. In this upper basin, which extends from Montana to Pennsylvania, sedimentary rocks of various kinds are widespread. Other kinds of rocks also are exposed in many places and serve as sources of sediment. Large areas in the upper basin are mantled by glacial drift and loess. Consequently, the alluvium consists of many kinds of minerals, most of which are slightly weathered.

The wide ranges in texture of the alluvium in Mississippi County results from differences in site of composition. When a river overflows and spreads over the flood plain, the coarse sediments are dropped first and then, along the channel, sands are deposited in bands. Thus, low ridges known as natural levees formed *(17)*. On these ridges, the Dubbs, Morganfield, Tiptonville, Bruno, and Crevasse soils formed. Finer sediments, such as silt, are laid down as the floodwaters spread. These sediments are generally mixed with sand and clay. Where water is left standing as shallow lakes or swamps, the clays settle; in these sediments, the Alligator, Sharkey, Iberia, Bowdre, Earle, Jeanerette, and Tunica soils formed.

This simple pattern of sediment distribution is not common along the Mississippi River, because through the centuries, the river channel has meandered back and forth across the flood plains. Sometimes the channel has cut out all or parts of natural levees, and at other times, it has deposited sand on top of slack-water clay or slack-water clay on top of sand. The normal pattern of distributing sediment from a single channel has been severely truncated in many places, and more recent beds of alluvium have been superimposed. The Bowdre and the Tunica are examples of water-transported soils formed in these kinds of materials. The Bowdre soils formed in thin beds of clayey sediments over coarser sediments, and the Tunica soils, in moderately thick beds of clay sediments over coarser sediments.

In some of the complexes and undifferentiated units in Mississippi County, especially the Sharkey-Steele complex, the loamy sand component generally consists of circular mounds, or sand blows. These blows are mainly in the sunken area of the county and are an effect of the New Madrid earthquake of 1811 *(6)*.

A great many combinations of kinds of sediments now occur on the flood plain. In many places parts of former river channels form oxbows with sandy and loamy natural levees; there are very gently sloping areas consisting of loamy sediments and large areas of slack-water clay. The slack-water clay has been fairly stable because it is farther from the meander belt of the river.

Some natural levees along abandoned channels have been in place long enough without deposition of fresh sediments to undergo significant leaching of cations and some translocation of clay. Originally, the sediments were stratified and mostly neutral to calcareous, as are the raw sediments along the present course of the Mississippi River. Dubbs, Dundee, Tiptonville, and other soils that formed on old natural levees are very strongly acid to medium acid. Their subsoils have accumulated clay eluviated from upper horizons (fig. 7). In the slack-water areas, soils such as the clayey Alligator and Earle are now very strongly acid or strongly acid, though they originally were neutral to calcareous.

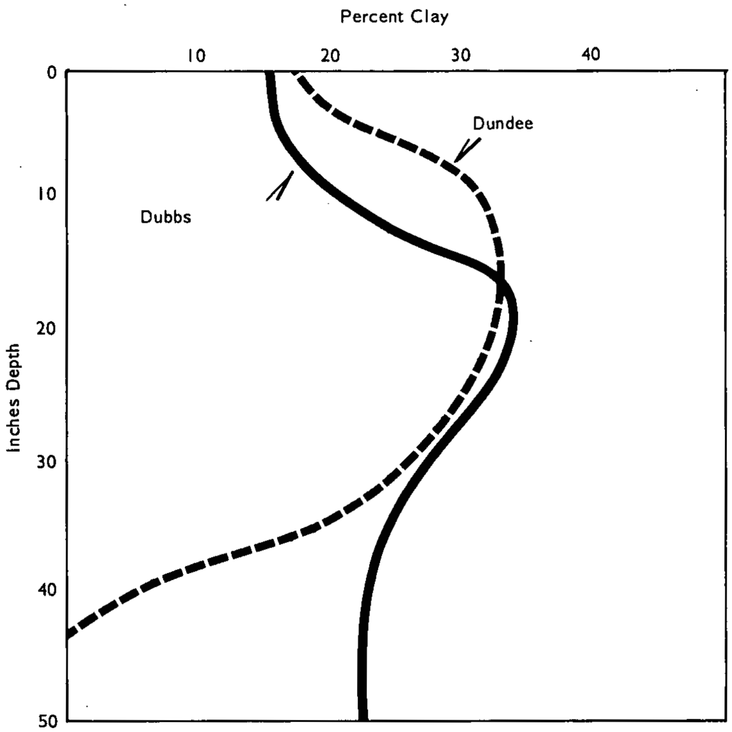

***Figure 7.*—Distribution of clay in Dubbs and Dundee soils.**

Differences in texture of the alluvium are accompanied by some differences in chemical and mineralogical composition. The sandier sediments normally contain more quartz than do sediments of intermediate or finer texture. They also have less feldspars and ferromagnesium and are commonly but not everywhere lower in carbonates.

Relief

Relief is the entrenchment of the drainage pattern into the land surface. The other soil-forming processes are affected by relief through its effect on drainage, runoff, erosion, and percolation of water through the soils.

Mississippi County lies within the flood plain of the Mississippi River. The relief ranges from level areas of slack-water clay to low ridges and swales in areas that once bordered a stream channel. Local differences in elevation are commonly less than 2 feet, but differences in a few areas along streambanks are as much as 15 feet. The total acreage of this greater relief is negligible. The highest elevation in the county, 260 feet above sea level, is in the northeastern part. The lowest elevation, 200 feet above sea level, is in the southeastern part.

Time

The length of time required for soil formation depends largely on other factors of soil formation. Usually, less time is required if the climate is warm and humid and the vegetation luxuriant. If other factors are equal, less time also is required where the parent material is coarse textured than where it is fine textured.

The soils in Mississippi County have been in place too short a time for mature soils to develop. Geologically, the soils in this county are young, and even now some areas receive fresh deposits of sediments at frequent intervals. It seems probable that the sediments now forming the surface of the county were deposited during and after the advance of the Wisconsin glaciers. The last of these glaciers retreated from the North Central States about 11,000 years ago *(8, 9)*.

Processes of Soil Formation

In this subsection a brief definition of the horizon nomenclature and processes responsible for soil horizon formation are given.

The marks that the soil-forming factors leave on the soil are recorded in the soil profile, which is a succession of layers, or horizons, from the surface to the parent rock. The horizons differ in one or more properties, such as color, texture, structure, consistence, porosity, and reaction.

Most soil profiles contain three major horizons, called A, B, and C. Young soils do not have a B horizon.

The A horizon, or the surface layer, can be the horizon of maximum accumulation of organic matter, called the A1 horizon, or it can be the horizon of maximum leaching of dissolved or suspended materials, called the A2.

The B horizon lies immediately beneath the A horizon and is sometimes called the subsoil. It is a horizon of maximum accumulation of dissolved or suspended materials, such as iron and clay. Commonly, the B horizon has blocky structure *(16)* and is firmer than the horizons immediately above and below it.

Beneath the B is the C horizon, which has been little affected by the soil-forming processes, though the C horizon can be materially modified by weathering. In some young soils, the C horizon immediately underlies the A horizon and has been slightly modified by living organisms, as well as by weathering.

Several processes have been active in the formation of soil horizons in the soils of Mississippi County. Among these processes are: (1) the accumulation of organic matter, (2) the leaching of calcium carbonates and bases, (3) the reduction and transfer of iron, and (4) the formation and translocation of silicate clay minerals. In most soils of the county, more than one of these processes has been active in soil formation.

Accumulation of organic matter in the upper profile to form an A1 horizon has been an important process in soil formation. Most of the soils of Mississippi County range from medium to low in content of organic matter.

Leaching of carbonates and bases has occurred in nearly all of the soils in Mississippi County. Among soil scientists, it is generally accepted that bases are leached downward in soils before silicate clay minerals begin to move. Most of the soils in the county are moderately leached, an important factor in horizon development.

Reduction and transfer of iron have occurred in the poorly drained and somewhat poorly drained soils of the county. In the naturally wet soils, this process is called gleying. Gray colors in the subsurface layer indicate the reduction and loss of iron. Some horizons contain reddish-brown mottles and concretions caused by segregated iron. Gleying is most pronounced in the Alligator, Amagon, and Forestdale soils.

In most soils of Mississippi County, the translocation of clay minerals has contributed to horizon development. In many places the eluviated A2 horizon has been destroyed by cultivation, but in areas where an A2 horizon occurs, its structure is blocky to platy; clay content is less than in the lower horizons; and the soil is lighter in color. Generally, clay films have accumulated in pores and on ped faces in the B horizon. The soils were probably leached of carbonates and soluble salts to a great extent before translocation of silicate clay occurred, even though content of bases is still high in all soils of the county.

Leaching of bases and translocation of silicate clay are among the most important processes in horizon differentiation in the soils of Mississippi County.

Classification of 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. They are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Because this system is under continual study, readers interested in developments of the current system should search the latest literature available *(10, 12)*.

The current system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped. In table 8, the soil series of Mississippi County are placed in some categories of the current system. Most of the classes of the current system are briefly defined in the following paragraphs.

ORDER: Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. Two exceptions, Entisols and Histosols, occur in many different climates.

As shown in table 8, four soil orders are represented in Mississippi County—Entisols, Inceptisols, Mollisols, and Alfisols. Entisols are young mineral soils that do not have genetic horizons or have only the beginning of such horizons. In Mississippi County many soils of this order were previously called Alluvial soils, Regosols, and Lithosols.

Inceptisols are mineral soils that generally occur on young, but not recent, land surfaces. Horizons have definitely started to form in these soils. Most soils of this order were previously called Ando soils and Sols Bruno Acides, and some were called Brown Forest soils, Low-Humic Gley soils, and Humic Gley soils.

Mollisols are friable soils that have a thick dark surface layer with moderate or strong structure and high base saturation. These soils are dominantly saturated with bivalent cations and have argillic or cambic horizons. Argillic and cambic horizons are diagnostic horizons that form below the soil surface. An argillic horizon is one in which illuvial silicate clay has accumulated This horizon is called a natric horizon if it contains an appreciable amount of exchangeable sodium and has prismatic or columnar structure. A cambic horizon is a layer in which changes have been sufficient to give rise to soil structure, liberate iron oxides, form silicate clay minerals, obliterate most evidence of original rock structure, or some combination of these.

The Mollisols in Mississippi County were formerly called Chernozems, Brunizems, Chestnut soils, and Reddish Prairie soils. Also included were the associated Humic Gley soils and Planosols, and those Rendzinas, Brown soils, Reddish Chestnut soils, and Brown Forest soils that have a mollic epipedon. A mollic epipedon is a diagnostic horizon that is a thick, dark-colored layer at the surface. This layer is much like surface layers formed under grass. This horizon may have moderate to strong structure, and it has base saturation of 50 percent or more.

Alfisols are soils that have argillic or natric horizons with accumulated aluminum and iron. Alfisols have a base saturation of more than 35 percent. This order includes most soils formerly called Gray-Brown Podzolic, Gray Wooded, Noncalcic Brown soils, and Chernozems and some soils called Planosols and Half Bog soils.

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

TABLE 8.—*Soil series in Mississippi County classified into higher categories*

Series	Current classification system		
	Family	Subgroup	Order
Alligator	Very fine, montmorillonitic, acid, thermic	Vertic Haplaquepts	Inceptisols.
Amagon	Fine-silty, mixed, thermic	Typic Ochraqualfs	Alfisols.
Bowdre	Clayey over loamy, mixed, thermic	Aquic Fluventic Hapludolls	Mollisols.
Bruno	Sandy, mixed, thermic	Typic Udifluvents	Entisols.
Commerce	Fine-silty, mixed, nonacid, thermic	Aeric Fluventic Haplaquepts	Inceptisols.
Convent	Coarse-silty, mixed, nonacid, thermic	Aeric Haplaquents	Entisols.
Crevasse	Mixed, thermic	Typic Udipsamments	Entisols.
Crowley	Fine, montmorillonitic, thermic	Typic Albaqaulfs	Alfisols.
Dubbs	Fine-silty, mixed, thermic	Typic Hapludalfs	Alfisols.
Dundee	Fine-silty, mixed, thermic	Aeric Ochraqualfs	Alfisols.
Earle	Clayey over loamy, montmorillonitic, acid, thermic	Vertic Haplaquepts	Inceptisols.
Forestdale	Fine, montmorillonitic, thermic	Typic Ochraqualfs	Alfisols.
Hayti	Fine-silty, mixed, nonacid, thermic	Fluventic Haplaquepts	Inceptisols.
Iberia	Fine, montmorillonitic, noncalcareous, thermic	Vertic Haplaquolls	Mollisols.
Jeanerette	Fine-silty, mixed, noncalcareous, thermic	Typic Argiaquolls	Mollisols.
Morganfield	Coarse-silty, mixed, nonacid, thermic	Typic Udifluvents	Entisols.
Routon	Fine-silty, mixed, thermic	Typic Ochraqualfs	Alfisols.
Sharkey	Very fine, montmorillonitic, nonacid, thermic	Vertic Haplaquepts	Inceptisols.
Steele	Sandy over clayey, mixed, nonacid, thermic	Aquic Udifluvents	Entisols.
Tiptonville	Fine-silty, mixed, thermic	Typic Argiudolls	Mollisols.
Tunica	Clayey over loamy, mortmorillonitic, nonacid, thermic	Vertic Haplaquepts	Inceptisols.

GREAT GROUP: Suborders are separated into great groups on basis of uniformity in kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus has 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 clays, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like. The great group is not shown separately in table 8, because it is the last word in the name of the subgroup.

SUBGROUP: Great groups are subdivided into subgroups, one representing the central (typic) segment of the group, and others, called intergrades, that have properties of the groups and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group.

FAMILY: Families are separated within a subgroup primarily on the basis of properties important to the growth of plants or behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

Nomenclature

The nomenclature of classes in each of the five highest categories is mainly connotative. The formative elements come chiefly from the classical languages. Because many of the roots are familiar, they are helpful in visualizing the soil. For example, the Amagon soils are classified as Typic Ochraqualfs. The formative elements indicate that Amagon soils are typical (typ), light colored (ochr), modified by water (aqu), and have a high base saturation (alf). The base saturation is 35 percent or more 40 inches below the top of the B horizon.

The names are distinctive for the classes in each category so that they indicate the category to which a given class belongs. Moreover, the names are so designed that each subgroup, by its name, identifies the soil with the great group, suborder, and order to which it belongs. For example, the name Typic Ochraqualfs indicates a class in a subgroup. For the name, one can identify the great group (Ochraqualf), the suborder (Aqualfs), and the order (Alfisols).

Physical and Chemical Analyses

Physical and chemical data from laboratory analyses are useful to soil scientists in classifying soils. These data are helpful in estimating available water capacity, base-exchange capacity, mineralogical composition, and other soil characteristics that affect management. They are also helpful in developing concepts of soil formation and, recently, have been helpful in rating soils for nonfarm uses.

The most extensive and important soils in the survey area are first considered when soil scientists select the soils for laboratory analyses. Generally, priority is given to the soils for which little or no laboratory data are available. Soils representing 15 series in the county were selected for the analyses; then laboratory tests were made by the Soils Laboratory, University of Arkansas, in Fayetteville. Table 9 gives data obtained from the analyses. The section "Descriptions of the

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TABLE 9.—*Physical and chemical*

[Analyses by the Soils Laboratory, University of Arkansas, Fayetteville, Ark. Lack of data indicates that

Soil and sample number	Depth	Horizon	Particle-size distribution: Very coarse sand (2.0 to 1.0 mm.)	Coarse sand (1.0 to 0.5 mm.)	Medium sand (0.5 to 0.25 mm.)	Fine sand (0.25 to 0.10 mm.)	Very fine sand (0.10 to 0.05 mm.)	Total sand	Silt (0.05 to 0.002 mm.)	Clay (less than 0.002 mm.)
	Inches		*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Alligator clay:										
S-65-Ark-47-5 (1)	0-9	Ap	0	0.66	0.66	2.71	1.26	5.3	28.8	65.9
S-65-Ark-47-5 (2)	9-20	Bg	0	.26	.37	.83	.83	2.3	17.8	79.9
S-65-Ark-47-5 (3)	20-51	Clg	0	.39	.45	.84	3.36	5.0	40.2	54.8
S-65-Ark-47-5 (4)	51-74	C2g	0	.24	.39	1.08	5.43	7.1	49.9	43.0
Amagon sandy loam:										
S-65-Ark-47-41 (1)	0-8	Ap	.05	7.80	15.20	18.75	9.90	51.7	43.0	5.3
S-65-Ark-47-41 (2)	8-15	A2g	0	1.39	5.38	7.98	8.84	23.6	67.0	9.4
S-65-Ark-47-41 (3)	15-22	B21tg	.05	1.20	4.63	6.10	4.12	16.1	51.9	32.0
S-65-Ark-47-41 (4)	22-36	B22tg	0	.83	2.26	6.59	11.02	20.7	47.3	32.0
S-65-Ark-47-41 (5)	36-60	B3g	0	1.08	1.85	4.40	23.47	30.8	46.0	23.2
Commerce silt loam:										
S-65-Ark-47-23 (1)	0-6	Ap	0	3.88	3.36	3.37	6.39	17.0	57.6	25.4
S-65-Ark-47-23 (2)	6-22	B	0	3.96	.83	1.64	4.07	10.5	59.6	29.6
S-65-Ark-47-23 (3)	22-58	C1	0	.08	.08	.46	4.58	5.2	70.0	24.8
Convent fine sandy loam:										
S-65-Ark-47-10 (1)	0-7	Ap	0	.22	.65	40.58	27.65	69.1	27.6	3.3
S-65-Ark-47-10 (2)	7-11	A1	0	.05	.05	10.71	71.19	82.0	16.2	1.8
S-65-Ark-47-10 (3)	11-23	C1	0	.15	.26	3.01	15.58	19.0	58.5	22.5
S-65-Ark-47-10 (4)	23-39	C2g	0	.05	.08	.51	6.36	7.0	79.0	14.0
S-65-Ark-47-10 (5)	39-61	C3g	0	.08	.08	.90	49.34	50.4	46.5	3.1
S-65-Ark-47-10 (6)	61-74	C4g	0	0	.03	.06	.31	.4	77.2	22.4
Dundee silt loam:										
S-65-Ark-47-25 (1)	0-7	Ap	0	3.71	4.75	12.29	15.05	35.8	49.6	14.6
S-65-Ark-47-25 (2)	7-13	B21t	0	.13	.21	1.95	3.71	6.0	64.5	20.5
S-65-Ark-47-25 (3)	13-31	B22t	0	.08	.15	.72	4.45	5.4	62.3	32.3
S-65-Ark-47-25 (4)	31-38	B3	0	.10	.13	3.84	22.23	26.3	52.1	21.6
S-65-Ark-47-25 (5)	38-52	C1	0	.08	.08	45.95	31.79	77.9	14.1	8.0
Forestdale silt loam:										
S-65-Ark-47-24 (1)	0-6	Ap	0	.53	2.38	6.08	21.41	30.4	53.6	16.0
S-65-Ark-47-24 (2)	6-12	B21tg	0	0	0	1.26	13.74	15.0	58.0	27.0
S-65-Ark-47-24 (3)	12-26	B22tg	0	.81	3.94	3.73	2.62	1.11	41.4	47.5
S-65-Ark-47-24 (4)	26-42	IIB3g	0	9.51	35.77	30.65	3.17	79.1	10.3	10.6
Iberia clay:										
S-65-Ark-47-35 (1)	0-4	Ap	0	.90	2.47	7.14	6.19	16.7	37.1	46.2
S-65-Ark-47-35 (2)	4-20	A1	0	.30	1.01	1.67	1.42	4.4	32.9	62.7
S-65-Ark-47-35 (3)	20-29	B21g	0	.74	.87	2.41	3.68	7.7	42.1	50.2
S-65-Ark-47-35 (4)	29-38	B22g	0	.18	.19	.68	.65	1.7	55.1	43.2
S-65-Ark-47-35 (5)	38-47	B3g	0	.11	.15	.32	.32	.9	39.6	59.5
Jeanerette silt loam:										
S-65-Ark-47-17 (1)	0-9	Ap	0	.46	1.82	13.57	22.05	37.9	34.1	28.0
S-65-Ark-47-17 (2)	9-26	B21tg	0	.05	.28	2.53	14.24	17.1	44.7	38.2
S-65-Ark-47-17 (3)	26-36	B22tg	0	.08	.10	1.69	20.33	22.2	51.5	26.3
S-65-Ark-47-17 (4)	36-42	B3g	0	.06	.10	7.62	18.52	26.3	49.5	24.2
Morganfield fine sandy loam:										
S-65-Ark-47-9 (1)	0-7	Ap	0	.33	1.96	37.38	24.23	63.9	32.8	3.3
S-65-Ark-47-9 (2)	7-11	A1	0	.26	.49	5.83	27.52	34.1	51.8	14.1
S-65-Ark-47-9 (3)	11-32	C1	0	.05	.10	2.86	26.49	29.5	63.3	7.2
S-65-Ark-47-9 (4)	32-62	C2	0	.07	.05	2.51	46.87	49.5	48.5	2.0
S-65-Ark-47-9 (5)	62-82	C3	0	.03	.05	.91	50.91	51.9	44.6	3.5
Steele loamy sand:										
S-65-Ark-47-20 (1)	0-6	Ap	0	.25	2.99	81.30	7.16	91.7	6.8	1.5
S-65-Ark-47-20 (2)	6-20	C1	0	50.04	.43	41.27	2.46	94.2	4.5	1.3
S-65-Ark-47-20 (3)	20-23	C2g	0	.13	.13	3.12	24.32	27.7	59.4	12.9
S-65-Ark-47-20 (4)	23-64	IIC3g	0	.21	.18	1.83	1.68	3.9	38.8	56.3

analyses of selected soils

analyses were not made; 0 indicates that amount determined was too low for significant interpretations]

USDA textural class	Extractable cations (milliequivalents per 100 grams of soil)						Base saturation	Reaction	Organic matter	Available phos-phorus
	K	Ca	Mg	Na	H	Total				
							Percent	*pH*	*Percent*	*Lbs. per acre*
Clay	0.97	13.06	6.25	0.40	14.85	35.53	58	5.6	2.8	94
Clay	.88	13.13	8.33	1.04	14.85	38.23	61	5.3	.8	63
Silty clay or clay	.47	9.25	8.33	2.12	8.73	28.90	70	5.3	.4	80
Silty clay	.46	26.25	8.33	2.37	2.40	39.81	94	6.7	.3	65
Sandy loam	.20	3.63	1.21	.23	3.44	8.71	61	5.9	2.0	49
Silt loam	.15	3.38	1.19	.19	2.45	7.36	67	6.2	.3	29
Silty clay loam	.33	4.50	3.24	.24	9.57	17.88	46	5.2	.2	72
Silty clay loam or clay loam	.45	4.88	3.42	.31	11.17	20.23	45	5.0	.2	76
Loam	.47	5.50	4.68	.50	6.00	17.15	65	5.3	.2	82
Silt loam	.91	8.44	3.65	.14	3.16	16.30	81	6.5	1.8	103
Silty clay loam	.47	10.25	4.17	.14	3.41	18.44	82	6.6	1.4	35
Silt loam	.33	9.50	5.00	.16	1.01	16.00	94	7.6	.6	23
Fine sandy loam	.31	2.75	1.56	.11	1.18	5.91	80	7.4	.5	92
Loamy very fine sand	.20	2.25	1.56	.11	.79	4.91	84	7.9	.1	100
Silt loam	.41	8.25	3.13	.17	2.46	14.42	83	7.2	1.1	54
Silt loam	.25	7.00	2.60	.14	1.65	11.64	86	7.5	.3	32
Very fine sandy loam	.16	4.25	1.56	.13	.93	7.03	87	7.3	.1	23
Silt loam	.37	7.75	3.64	.22	1.21	13.19	91	7.5	.4	21
Silt loam or loam	.40	6.25	1.04	.34	2.94	10.97	73	6.0	1.3	56
Silty clay loam	.45	9.75	1.67	1.30	5.83	19.00	69	5.4	.8	43
Silty clay loam	.45	9.00	1.67	.78	7.32	19.22	62	5.1	.3	58
Silt loam	.32	6.81	1.46	.36	5.09	14.04	64	5.0	.4	49
Fine sandy loam or loamy fine sand	.17	3.50	1.15	.22	3.05	8.09	62	5.6	.1	47
Silt loam	.44	5.25	2.08	.16	4.05	11.98	66	....	.7	78
Silty clay loam or silt loam	.42	8.75	2.08	.33	5.45	17.03	68	....	.7	50
Silty clay	.64	14.38	3.65	.51	9.36	28.54	67	....	.7	43
Fine sandy loam	.17	3.25	1.25	.17	1.85	6.69	72	....	.4	44
Clay	.56	20.25	4.69	.20	5.46	31.16	82	6.5	2.4	92
Clay	.60	28.50	7.00	.38	.71	41.19	89	6.9	1.2	44
Silty clay	.56	28.75	7.33	.43	5.01	42.08	88	7.2	.8	37
Silty clay	.79	30.50	7.50	.52	8.87	48.18	82	7.2	1.0	31
Clay or silty clay	.82	21.88	7.00	.57	1.79	32.06	94	7.5	.7	24
Loam or clay loam	.54	9.38	2.60	.14	4.07	16.73	75	6.4	1.4	92
Silty clay loam or clay loam	.68	13.50	4.17	.27	4.67	23.29	80	6.3	.8	39
Silt loam	.38	11.63	2.92	.18	4.17	19.28	78	6.4	.4	44
Silt loam or loam	.38	11.50	2.92	.19	4.68	19.67	76	6.6	.3	38
Fine sandy loam	.28	2.50	1.56	.45	1.08	5.87	82	7.5	.3	78
Silt loam	.33	7.63	3.13	.14	3.74	14.97	75	7.4	1.7	112
Silt loam	.21	5.25	1.56	.10	1.38	8.50	84	7.6	.4	78
Very fine sandy loam	.18	4.25	1.56	.10	.74	6.83	89	7.8	0	67
Very fine sandy loam	.16	4.37	1.56	.10	1.97	8.16	76	8.2	.1	62
Fine sand	.26	1.94	1.04	.13	1.98	5.35	63	6.1	.9	76
Sand	.47	1.31	1.15	.14	.58	3.65	84	7.8	0	76
Silt loam	1.17	4.63	2.08	.14	1.80	9.82	82	7.9	.5	56
Clay	1.19	17.25	3.75	.35	6.64	29.18	77	8.1	.5	39

Soils" describes profiles of the soils analyzed. Soil textures reported in table 9 are not necessarily the same as those stated in the section "Descriptions of the Soils," which are field estimates.

Particle-size distribution was determined by the hydrometer method *(4)*. Organic carbon was determined by the Walkley-Black method of digestion with potassium dichromate-sulfuric acid *(7)*. Organic matter was determined by use of the equation: percent organic carbon x 1.72 = organic matter.

Soil reaction (pH) was determined by using a Beckman model pH meter on mixtures of soil and water at a ratio of 1:1. Available phosphorus was extracted by the Bray No. 1 solution (0.03 N NH4F in 0.025 N HCL) and determined colorimetrically.

Potassium, calcium, magnesium, and sodium were extracted with normal ammonium acetate buffered at pH 7.0 with ammonium hydroxide. Calcium, potassium, and sodium in the extract were determined with a flame emission spectrophotometer. Magnesium in the extract was determined colorimetrically after the color was developed by adding hydroxylamine chloride solution, gum arabic solution, clayton yellow solution, and sodium hydroxide solution *(7)*.

Extractable hydrogen was determined by reaction of the soil with a buffer solution of barium chloride and triethanolamine. The leachate from this reaction was then titrated with hydrochloric acid *(2, 3)*.

The total extractable calcium, hydrogen, potassium, magnesium, and sodium approximate the cation exchange capacity of the soil. Base saturation percentage is determined by dividing the total of the extractable bases by the sum of the extractable cations and multiplying by 100.

General Nature of the County

This section discusses the climate, farming, and physiography and drainage in Mississippi County. It also discusses natural resources, woodland, and industry. Statistics in the discussion of farming are from the 1964 Census of Agriculture.

Climate [6]

Mississippi County is in the northeastern part of Arkansas in the typically nearly level flood plain of the Mississippi River. Elevations do not vary more than 50 to 100 feet throughout the county. Because the topography generally is level, it has no noticeable effect on the weather. Table 10 is a climatic summary of temperature and precipitation at Blytheville.

The climate of Mississippi County, like all of Arkansas, is one of warm summers and mild winters. Commonly, there are winter storms and outbreaks of polar and even arctic weather, though these intensive cold and snow fronts are of short duration. The summers are hot and humid because the air masses from the Gulf of Mexico are hot and moist and dewpoints are high. From late in May until early in Setember, only a few cold fronts reach the area. The county is occasionally relieved from hot weather in summer, though cool air sometimes penetrates Arkansas no farther than the extreme northeastern part.

The precipitation, which averages a little less than 48 inches per year, is adequate for most crops. It is fairly evenly distributed throughout the year. Fall is the driest season, and winter is the wettest. In January, the wettest month, precipitation averages almost twice the 2.8 inches normally received in October. Frontal systems that have low pressure circulation are by far the most reliable sources of precipitation. Although convective clouds occur almost daily in summer, they are erratic sources of rainfall.

In Mississippi County a productive rain is most likely when a moisture-laden warm front approaches from the southwest. A trough of low pressure, plus moisture from the Gulf of Mexico, can bring as much as 8 to 10 inches of rain in any month.

In winter, the cold air often penetrates so far south that the moisture from the gulf is limited to coastal areas south of Arkansas. In winter and early in spring, however, the moist air from the gulf merges with dry, continental air, and excessive rainfall can be expected. In January, the chance that precipitation will exceed 1 inch is 90 percent and is 10 percent that it will exceed 10 inches.

Snowfall is negligible as a source of precipitation. The normal annual amount is less than 5 inches. In actual water this amount represents only about 1 percent of the total annual precipitation.

Despite the generally abundant rainfall, short periods of drought are frequent throughout the county. Severe to extreme droughts have been reported in only 7 percent of the months in the past 35 years of record. The most severe drought began late in 1953 and lasted for 18 months.

Temperature data for the county show that winters are mild, summers are hot, and the growing season is long. Approximately 60 percent of the year is frost free. The sun is intense from mid-May through mid-September. It keeps the humidity and loss of soil moisture through evaporation high. Evaporation rates average as much as one-third of an inch per day in summer. Winters are characterized by cool, cloudy, rainy weather followed by clear, cold periods and then warmer weather with increased cloudiness and rain.

Thunderstorms occur in Mississippi County on an average of slightly more than 50 days each year. From 1916 through 1961, 35 tornadoes were observed in the county and five adjoining or nearby counties in the northeastern part of Arkansas and southeast Missouri.

Records from the U.S. Weather Bureau Station at Blytheville show that the average number of days is 243 between the last freezing temperature of 28° F. or lower in spring and the first such temperature in fall. The average is 220 days between temperatures of 32° or lower. The average date of the last freezing temperature of 28° F. in spring is March 14, and the average of the first in fall is November 12. The average date of the last temperature of 32° in spring is March 28, and that of the first in fall is November 3. The latest date that a temperature of 28° has been recorded was

[6] ROBERT O. REINHOLD, meteorologist in charge, U.S. Weather Bureau, Little Rock, Ark., assisted in preparing this subsection.

TABLE 10.—*Temperature and Precipitation*

[All data from Blytheville, Ark., for period 1931-60]

Month	Temperature: Average daily maximum	Temperature: Average daily minimum	Temperature: Two years in 10 will have at least 4 days with— Maximum temperature equal to or higher than—	Temperature: Two years in 10 will have at least 4 days with— Minimum temperature equal to or lower than—	Precipitation: Average monthly total	Precipitation: One year in 10 will have— Less than—	Precipitation: One year in 10 will have— More than—
	°F.	°F.	°F.	°F.	In.	In.	In.
January	49	31	73	5	5.45	1.55	9.87
February	53	33	75	7	4.33	1.11	7.45
March	61	40	82	18	5.00	1.87	8.75
April	73	50	89	29	4.01	1.95	7.20
May	81	57	95	41	4.17	1.08	6.44
June	90	68	101	52	3.29	.48	6.25
July	92	70	101	55	3.66	.53	6.50
August	91	69	104	53	3.38	.33	6.38
September	86	61	100	42	3.21	.51	7.08
October	76	50	92	30	2.80	.87	5.76
November	61	39	82	16	3.93	1.32	7.67
December	51	33	74	7	4.24	1.50	7.04
Year	72	50			47.47	34.90	58.90

April 11, 1960, and the earliest was October 24, 1937. The latest date that a temperature of 32° has been recorded was April 20, 1936, and the earliest date was October 15, 1937.

Farming

In Mississippi County the people depend mainly on farming as a means of livelihood. The early settlers based their economy on the plantation system, and cotton was the main crop. Since 1933, when the first allotment was placed on cotton, the importance of that crop has declined and the cropping system has become diversified. Soybeans and small grains have increased in importance.

Most farms in Mississippi County are general farms that produce soybeans, cotton, wheat, and alfalfa; a few also produce corn or rice. On a few general farms there are fairly large herds of beef cattle. Table 11 shows the acreage of principal crops grown in selected years.

According to the 1964 Census of Agriculture, the approximate land area of the county was 589,440 acres. About 89.2 percent of this acreage was in farms, and the rest consisted of wooded tracts, cities, roads, railroads, and urban areas. In 1964 the cropland harvested totaled 469,090 acres.

Farms in Mississippi County are decreasing in number and increasing in size. Between 1959 and 1964, the farms in the county decreased from 2,904 to 1,828 in number and the average sized farm increased from 184 acreas to 288 acres. Large farms are increasing in number, but small farms are decreasing. In 1959 there were 23 farms of 2,000 acres or more, and by 1964, farms of this size had increased to 27. In 1959 there were 415 farms in the county of less than 10 acres, but by 1964, the number of farms of this size decreased to 225.

TABLE 11.—*Acreage of principal crops for stated years*

Crops	1959	1964
Soybeans harvested for beans	243,517	244,179
Cotton	189,656	176,328
Wheat	27,486	100,189
Corn for all purposes	13,784	3,569
Rice	1,356	1,533
Alfalfa and alfalfa mixtures cut for hay	3,458	3,577

Of the farm operators in the county in 1964, 261 were full owners, 430 part owners, 45 managers, and 1,092 were tenants.

The number of livestock in Mississippi County has been decreasing for several years. Most beef cattle are of good grade. The dairy cattle generally are of poor quality and are kept mainly for home use. Table 12 gives the kinds and number of the principal livestock in the county in 1959 and 1964.

TABLE 12.—*Number of livestock in stated years*

Livestock	1959	1964
All cattle and calves	7,809	7,506
Milk cows	308	72
Hogs and pigs	12,977	5,429
Chickens [1]	53,089	17,455

[1] More than 4 months old.

In this county most of the farms are family size. The family does most of the work, but outside labor is hired occasionally. The family-sized farms are generally in the western one-fourth of the county. The larger farms are operated either by tenants or by day laborers, who are supervised by the owner or manager. Tenants pay fixed rent or a percentage of the crop for the use of the land. In recent years the trend has been toward hiring day laborers.

The amount of equipment and the facilities available on the farms in Mississippi County vary widely. The larger farms are highly mechanized, and most of the other farms are considerably mechanized. Many farmers use chemicals for weed control.

Physiography and Drainage

The geological deposits on the surface of Mississippi County consist of alluvium from the Mississippi River. Alluvial sediments are the parent materials of the soils in the county. The thickness of the sediments ranges from 100 to 180 feet. The alluvium is a mixture of minerals from many kinds of soils, rocks, and unconsolidated sediments that came from more than 24 States.

Mississippi County is a part of an immense deltaic flood plain that reaches from Cairo, Ill., to the Gulf of Mexico. The topography is generally level to nearly level and ranges from broad flats to gently sloping ridges and swales. Elevation ranges from 200 to 260 feet above sea level. Slopes are generally less than 1 percent, but slopes on a few streambanks are as much as 15 percent. The total acreage of steep soil is very small.

The drainage of Mississippi County is generally southward. The major natural drainageways in the county are the Mississippi River, Pemiscot Bayou, Left Hand Chute of Little River, Right Hand Chute of Little River, Buffalo Creek, and the Tyronza River. The area protected by the levee of the Mississippi River drains into the St. Francis River; this river, in turn, empties into the Mississippi River. The area on the river side of the levee drains directly into the Mississippi River.

Natural Resources

Soil, water, forest, and sand are the four main resources of Mississippi County. The soils and forest are discussed in other parts of this survey.

Mississippi County is well supplied with streams, bayous, and lakes, but some streams are dry part of the year. The principal streams are the Mississippi River, Right Hand Chute of Little River, Left Hand Chute of Little River, the Tyronza River, and Buffalo Creek. The main lakes are Crooked, Long, Big, and Swan. Along the Mississippi River are many unnamed oxbow lakes and abandoned channels.

An abundant supply of ground water can be obtained from wells throughout the county. Wells drilled to a depth of 110 feet furnish about 1,700 gallons of water per minute. Water from the wells is of poor to good quality and is used to irrigate rice and the commonly grown row crops.

Beneath the soils in Mississippi County is a layer of sand. Depth to the sand ranges from a few inches to about 25 feet. After the surface material is stripped off, exposed sand is mined from open pits. Some sand and gravel is dredged from the Mississippi River and is used in road construction and in concrete.

Woodland [7]

Mississippi County at one time was covered by virgin forests. The deep, rich alluvium supported some of the best hardwoods in the South. The principal species were sweetgum, cottonwood, hackberry, pecan, baldcypress, ash, sycamore, and persimmon, and the oaks, Southern red, Shumard, cherrybark, water, willow, pin, overcup, and swamp chestnut.

In recent years much land has been cleared, and the original forest cover has been reduced to less than 10 percent of the total land area. If the present trend in land clearing continues, the acreage in trees will be further reduced until about all of the woodland remaining in the county will be in narrow bands along the major drainageways and on the river side of levees.

Because the woodland in the county has such a small acreage, and because this acreage is decreasing, woodland interpretations are not given in this survey. Local representatives of the Soil Conservation Service can be consulted for specific information on uses of the soils as woodland.

Industry

In Mississippi County, there are 58 cottongins, five cotton compresses, three cottonseed and soybean oil mills, four alfalfa dehydrators, and six grain elevators and dryers. Among the factories in the county are two garment, two shoe, two farm implement, three farm implement parts, a mobile home, a furniture, and a hearse factory. Among the plants are one that makes greeting cards, a textile plant, a vegetable oil processing plant, a strawberry processing plant, two canneries, two bakeries, and three meat packing plants. Other industries in the county are a plant that manufactures fertilizer, two bottling companies, four ice plants, four ready-mix concrete plants, and a gravel and sand dredge.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregate 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 a soil to hold water in a form available to plants. Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coefficient, or about 15 atmospheres of tension.

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.

Claypan. A compact, slowly permeable soil horizon that contains more clay than the horizon above and below it. A claypan is commonly hard when dry and plastic or stiff when wet.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Eluviation. The transportation of dissolved or suspended material within the soil by the movement of water when rainfall exceeds evaporation.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has been allowed to drain away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Green manure. A crop which is plowed under green for its beneficial effect on the soil.

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:

0 horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

Leached soil. A natural soil from which most of the more soluble constituents have been removed through the entire profile or removed from one part of the profile and accumulated in another part.

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.

Munsell notation. A system for designating color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10 YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Natural soil drainage. Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Imperfectly or somewhat poorly drained soils are wet for significant periods but not all the time, and in Podzolic soils commonly have mottlings below 6 to 16 inches, in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Parent material. The disintegrated and partly weathered rock material from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

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 or plowsole. A compacted layer formed in soil immediately below the plowed layer.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is 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 degree of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Runoff (hydraulics). The part of the precipitation upon a drainage area that is discharged from the area in stream channels. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called groundwater runoff or seepage flow from ground water. Classes of surface runoff are *ponded, very slow, slow, medium, rapid,* and *very rapid.*

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.

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.

Soil separates. Mineral particles, less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *Very coarse sand* (2.0 to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.002 millimeter). The separates recognized by the International Society of Soil Science are as follows: I (2.0 to 0.2 millimeter); II (0.2 to 0.02 millimeter); III (0.02 to 0.002 millimeter); IV (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

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 aggregate 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.

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.

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