Series 1962, No. 13

Issued March 1967

SOIL SURVEY

Chicot County Arkansas

OUR SOIL ★ OUR STRENGTH

This is the last report of the 1962 series

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

HOW TO USE THIS SOIL SURVEY REPORT

THIS SOIL SURVEY of Chicot County, Ark., contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, or other structures; and in appraising the value of tracts of land for agriculture, industry, or recreation.

Locating Soils

All the soils in Chicot County are shown on the detailed map at the back of this report. This map consists of many sheets that are made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

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

Finding and Using Information

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

Individual colored maps showing the relative suitability or limitations of soils for many specific purposes can be developed by using the soil map and information in the text. Interpretations not included in the text can be developed by grouping the soils according to their suitability or limitations for a particular use. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils in the soil descriptions and in the discussions of the interpretative groupings.

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

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

Community planners and others concerned with suburban development can read about the soil properties that affect the choice of homesites, industrial sites, schools, and parks in the section "Nonagricultural Uses of the Soils."

Engineers and builders will find under "Engineering Applications" tables that give descriptions of the soils in the county and that name soil features that affect engineering practices and structures.

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

Students, teachers, and others will find information about soils and their management in various parts of this report.

Newcomers in Chicot 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."

* * * * *

Fieldwork for this survey was completed in 1962. Unless otherwise indicated, all statements in this report refer to conditions in the county at the time the survey was in progress. This survey of Chicot County was made as part of the technical assistance furnished by the Soil Conservation Service to the Chicot County Soil Conservation District, which was organized in 1950.

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SOIL SURVEY OF CHICOT COUNTY, ARKANSAS

BY HARDY CLOUTIER AND CHARLES J. FINGER, SOIL CONSERVATION SERVICE

FIELD SURVEY BY HARDY CLOUTIER, FRED C. LARANCE, AND H. WADE LONG, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE ARKANSAS AGRICULTURAL EXPERIMENT STATION

CHICOT COUNTY is in the extreme southeast corner of Arkansas (fig. 1). It is roughly rectangular, although the east boundary is very irregular because of the meandering Mississippi River. The county, including all bodies of water, covers an area of 414,080 acres, or 647 square miles.

About 60 percent of Chicot County consists of level to gently undulating clayey material derived from Mississippi River alluvium. This clayey material is mainly in slack-water areas. About 27 percent of the county consists of sandy and silty material also derived from alluvium. This material is on banks of bayous, along shores of oxbow lakes, and along other former channels of the Mississippi and Arkansas Rivers. About 13 percent of the county consists of nearly level to moderately steep silty material derived from loess. This material is in the Macon Ridge area. On the eastern edge of the ridge is a steep escarpment that is a well-defined break between the alluvium and the loess.

The humid, temperate, continental climate of this county is characterized by warm summers and mild winters.

Soybeans, rice, and cotton are the major crops grown in the county. The general trend in land use has been to clear wooded areas and put them in soybeans or in soybeans rotated with rice. The major pasture plants are Coastal bermudagrass, common bermudagrass, dallisgrass, tall fescue, and white clover.

Poor drainage is the major limitation of the soils in the county. Erosion is a minor limitation on the Macon Ridge escarpment.

How This Soil Survey Was Made

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

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, the major horizons of all the soils of one series are similar in thickness, arrangement, and other important distinguishing 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. McGehee and Portland, 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 natural characteristics.

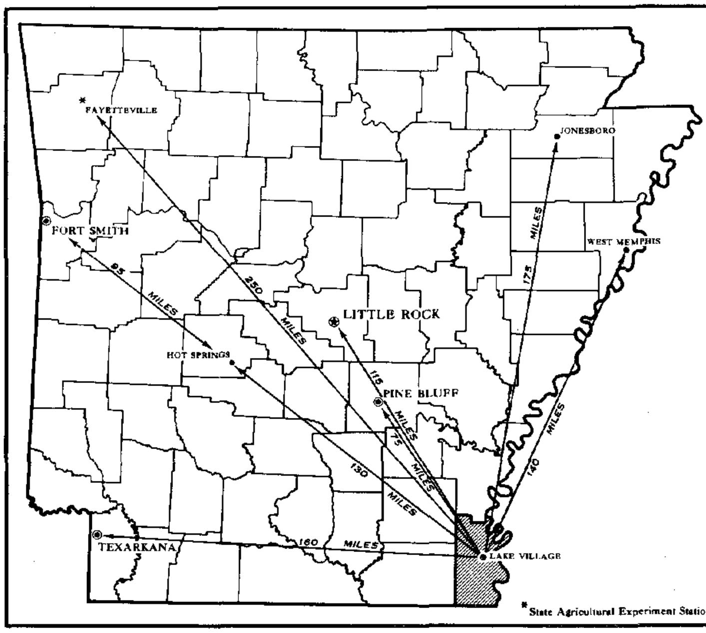

Figure 1.—**Location of Chicot County in Arkansas.**

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

Some soil types vary so much in slope, degree of erosion, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into soil phases. The name of a soil phase indicates a feature that affects management. For example, Grenada silt loam, 3 to 8 percent slopes, is one of several phases of Grenada silt loam, a soil type that ranges from level to moderately sloping.

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

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

In preparing some detailed maps, the soil scientists have the problem of delineating an area where two or more kinds of soils occur in such an intricate pattern and in individual areas so small in size that they cannot be shown separately on the soil map. Therefore, such an area is shown as one mapping unit and is called a complex. Ordinarily, a complex is named for the major soils in it, for example, Calloway-Grenada silt loams.

Occasionally, two or more similar kinds of soils that do not occur in regular geographic association are shown as one mapping unit because separating the soils would have little significance. Such a mapping unit is called an undifferentiated soil group. It is named for its constituent soils, and the names are connected by "and." Hebert and Crowley silt loams is an undifferentiated soil group in Chicot County.

Also, on most soil maps, areas are shown that are so rocky, so shallow, so frequently worked by wind and water, or so disturbed by man that they are not identifiable as soils. These areas are given descriptive names, like Gullied land. This kind of mapping unit is called a land type.

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

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in soil survey reports. On basis of the yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. Then, the scientists 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 report shows, in color, the soil associations in Chicot County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of 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 slope, depth, stoniness, drainage, and other characteristics that affect management.

Described in the following pages are the eight soil associations in Chicot County.

1. Calloway-Henry-Grenada association

Level to moderately steep, poorly drained to moderately well drained, silty loessal soils

This association consists of strongly acid soils that formed in thick deposits of windblown silt. It is in the south-central part of the county and takes up about 13 percent of the county.

Grenada soils make up about 45 percent of this association, Calloway soils 35 percent, and Henry soils 15 percent. Minor soils and Gullied land make up the rest. Grenada soils are moderately well drained. They have a dark-brown to brown surface layer and a brown subsoil. Calloway soils are somewhat poorly drained. They have a dark grayish-brown surface layer and a pale-brown subsoil. Henry soils are poorly drained. They have a dark-gray surface layer and a light-gray subsoil. All of these soils have a compact, dense fragipan in their subsoil. The fragipan is silt loam or silty clay loam that is hard and brittle when dry. It is so compact that moisture moves very slowly through it and roots make their way into it only through a few channels and cracks. In many places a perched water table is above the pan.

Most of this association is nearly level or gently sloping, but moderately steep areas and Gullied land are in a narrow strip along the eastern edge of the association.

This association is well suited to pasture and to pine trees. It is one of the major pasture areas in the county. About 65 percent of its acreage is pastured; the rest is wooded (25 percent) or is cultivated (10 percent). The area is made up mostly of small farms that are worked by the individual owners. Farms average 100 acres in size. The major pasture plants are Coastal bermudagrass, common bermudagrass, dallisgrass, tall fescue, and white clover. The major crops are soybeans, cotton, oats, and lespedeza.

Grenada soils are fairly well suited as sites for residential development and as a foundation for roads, but Calloway and Henry soils are poorly suited.

2. Perry-Portland association

Level to gently undulating, poorly drained and somewhat poorly drained clayey soils that formed in Arkansas River alluvium

This association occupies about 38 percent of the county and occurs entirely in the western part.

Perry soils make up about 75 percent of this association, Portland soils about 15 percent, and Hebert and McGehee soils make up the rest. Perry soils are poorly drained. To a depth of about 25 inches, they are gray to dark gray and acid. Below that they are reddish brown and neutral. Portland soils are somewhat poorly drained. They have a 4-inch surface layer that is dark grayish brown and slightly acid. Their subsoil is reddish brown and alkaline.

This association is well suited to rice, row crops, and pasture. It is one of the major rice and soybean areas in the county. About 70 percent of its acreage is cultivated, 15 percent is pastured, and 15 percent is wooded. About 60 percent of the farms in this area are worked by the individual owners. The remaining 40 percent are worked under crop-rental agreements. The major crops are rice and soybeans, and the major pasture plants are Coastal bermudagrass, common bermudagrass, dallisgrass, tall fescue, and white clover.

The soils in this association have severe limitations for use as residential sites or as a foundation for roads.

3. Hebert-McGhee association

Level to gently undulating, somewhat poorly drained silty soils that formed in Arkansas River alluvium

This association consists of acid soils in small areas on the bottom lands. It makes up about 3 percent of the county.

Hebert soils make up about 50 percent of this association, McGehee soils about 40 percent, and minor soils about 10 percent. The Hebert soils developed in thick beds of silty material. They have a surface layer of brown silt loam and a subsoil of light brownish-gray silty clay loam. McGehee soils developed in thick beds of silty material over clay. They have a surface layer of dark-brown silt loam and a subsoil of pale-brown to light brownish-gray silty clay. Below a depth of 19 inches their color is reddish brown.

This association is fairly well suited to farming. It is about 70 percent cultivated. Soybeans, rice, cotton, and grain sorghum are the major crops.

The soils in this association are not favorable residential sites. They are slowly permeable, and thus their use as filter fields for septic tanks is limited. They have, however, few limitations for use as a foundation for roads.

4. Gallion-Hebert association

Level and nearly level, somewhat poorly drained and well-drained, sandy and silty soils that formed in Arkansas River alluvium

This association consists of medium acid to very strongly acid soils along the western boundary of the county. It makes up about 1 percent of the county.

Gallion soils make up about 60 percent of this association, Hebert soils about 20 percent, and minor soils about 20 percent. Gallion soils are sandy and silty, and well drained. Their surface layer is dark brown, and their subsoil is brown in the upper part and reddish brown in the lower part. Hebert soils are silty and are somewhat poorly drained. Their surface layer is brown, and their subsoil is light brownish gray.

This association is well suited to cultivated crops and to pasture. It is one of the main areas in the county for row crops. About 80 percent of its acreage is cultivated, 15 percent is pastured, and 5 percent is wooded. Farms in this area average about 300 acres in size. About half of the farms are owner operated. The others are rented, and the individual owners generally take their rent in crops. The major crops are cotton and soybeans, and the major pasture plants are Coastal bermudagrass, common bermudagrass, dallisgrass, tall fescue, and white clover.

The soils in this association are well suited as sites for residential development and as a foundation for roads.

5. Gallion-Lonoke association

Level and nearly level, well-drained, sandy and silty soils that formed in Arkansas River alluvium

The soils in the Gallion-Lonoke association formed on natural levees along streams in the northwestern and north-central parts of the county. This association takes up about 4 percent of the county.

Gallion soils make up about 60 percent of this association, and Lonoke soils about 30 percent. Inclusions of Hebert soils make up the rest. Gallion soils are sandy and silty, and they are acid in reaction. Their surface layer is dark brown, and their subsoil is brown in the upper part and reddish brown in the lower part. Lonoke soils are silty and are slightly acid to strongly acid. Their surface layer is dark brown, and their subsoil is brown.

This association is well suited to cultivated crops and to pasture. It is one of the major row-crop areas in the county. About 80 percent of its acreage is cultivated, 15 percent is pastured, and 5 percent is wooded. Farms in this area average 350 acres in size. About half of the farms are owner operated, and about half are rented. The individual owners generally take their rent in crops.

The major crops are cotton and soybeans, and the major pasture plants are Coastal bermudagrass, common bermudagrass, dallisgrass, tall fescue, and white clover.

The soils in this association are well suited as sites for residential development and to use as a foundation for roads.

6. Mixed alluvial land association

Recent alluvium along the Mississippi River; subject to frequent overflow

This association consists of mixed, coarse-textured to fine-textured material in the area between the Mississippi River and the levee along the river. It covers about 10 percent of the county. The area is frequently flooded and is subject to change with each overflow.

About 80 percent of the acreage is wooded, 15 percent is pastured, and 5 percent is cultivated.

7. Sharkey-Bowdre association

Level to gently undulating, poorly drained and moderately well drained clayey soils that formed in Mississippi River alluvium

The Sharkey-Bowdre association consists of soils that formed in slack-water deposits on bottom lands. It is in the eastern part of the county, parallel to the Mississippi River, and occupies about 26 percent of the county acreage. It is characterized by broad flats, depressions, and narrow ridges that rise 1 foot to 3 feet above the flats.

Sharkey soils cover 80 percent of this association, Bowdre soils 15 percent, and minor soils 5 percent. Sharkey soils developed in thick beds of clay deposited by still or very slowly moving floodwater. These soils have layers of gray to dark-gray, plastic clay to a depth of at least 42 inches. They are poorly drained and are slightly acid to alkaline. Bowdre soils, on the other hand, developed in thin beds of clay underlain by coarser textured sediment. They have a surface layer of very dark grayish-brown silty clay loam. This layer is underlain by a 15-inch layer of very dark grayish-brown clay that, in turn, is underlain by coarser textured material. Bowdre soils are moderately well drained and are slightly acid to alkaline.

This association is well suited to farming. It is about 80 percent cultivated and nearly 20 percent wooded. It is one of the major rice- and soybean-producing areas in the county. Sharkey soils, especially, are well suited to rice culture. Farms in this area average about 550 acres in size and are highly mechanized. About 50 percent of the farms are owner operated, and the others are operated under crop-rental agreements. Almost all of the farms have well-kept buildings, including the headquarters and some small houses for laborers. The major crop is soybeans. Other commonly grown crops are rice, cotton, and alfalfa.

Because of the flat or concave relief, this association is not well suited as a site for residential development. The soils are very slowly permeable and thus are not good filter fields for septic tanks. The soils are not favorable as road-building material, because of their low load-bearing capacity when wet and their very high shrink-swell potential.

8. Commerce-Dundee association

Level to gently undulating, somewhat poorly drained and moderately well drained silty soils that formed in Mississippi River alluvium

This association consists of areas that are adjacent to oxbow lakes along the Mississippi River. It makes up about 5 percent of the county.

Commerce soils make up about 60 percent of this association, and Dundee soils about 30 percent. Inclusions of Bowdre and Robinsonville soils make up the rest. Commerce soils are moderately well drained and slightly acid to mildly alkaline. Their surface layer is dark grayish-brown loam or silty clay loam, and their subsoil is dark grayish-brown loam or silt loam. The layer immediately below the subsoil also is loam or silt loam. Dundee soils are somewhat poorly drained and are strongly acid to neutral. Their surface layer is dark grayish-brown silt loam. Their subsoil is dark grayish-brown silty clay loam, and the layer immediately below that is grayish-brown silt loam.

This association is well suited to cultivated crops and to pasture. It is one of the main areas in the county for row crops. It is about 75 percent cultivated, 20 percent pastured, and 5 percent wooded. Farms in this area average 400 acres in size. About half of the farms are owner operated; the others are operated under crop-rental agreements. The major crops are cotton and soybeans, and the major pasture plants are Coastal bermudagrass, common bermudagrass, dallisgrass, tall fescue, and white clover.

The soils in this association are fairly well suited to residential development and to use as road-foundation material.

Descriptions of the Soils

This section provides fairly detailed information about the soils in Chicot County. General information about the soils can be found in the section "General Soil Map," where broad patterns of soils are described. Detailed technical information can be found in the section "Formation and Classification of the Soils."

First, this section describes the soil series. In the description of each soil series, a profile is included that is representative for all the soils of the series; important features that apply to all the soils of the series are pointed out; some of the similar or nearby soils are mentioned; and use of the soils and their suitability for agriculture are discussed briefly.

Next, this section describes the individual soils, or mapping units, of the series. In parentheses following the name of each soil is the symbol that identifies the soil on the detailed soil map that is in the back of this report. The descriptions give the characteristics of each soil that distinguish it from all other soils. The description of each soil ends with a reference to the capability unit in which it has been placed; the capability units are discussed in another part of this report.

This section includes a table (table 1) that gives the approximate acreage and proportional extent of the individual soils. The soil map in the back of this report shows the location and distribution of the soils, and the

Glossary defines many of the technical terms used in this section.

Bowdre Series

The soils in the Bowdre series are level to gently undulating, slightly acid or neutral, and moderately well drained. They formed in thin beds of Mississippi River clayey alluvium that overlies coarser textured sediment. This is a representative profile:

0 to 5 inches, very dark grayish-brown, plastic silty clay loam.
5 to 13 inches, very dark grayish-brown, plastic clay; blocky structure.
13 to 17 inches, brown, firm sandy clay loam.
17 to 45 inches, brown, friable silt loam; yellowish-brown mottles.
45 to 68 inches, dark grayish-brown, loose loamy sand.

Layers (the upper three) of fine textured and moderately fine textured material make up the uppermost 13 to 19 inches of the profile. The lower part of the subsoil, which begins at a depth of about 17 inches, may be sandy loam, loamy fine sand, silt loam, or light sandy clay loam, and it is alkaline in places. In places the material in this part of the profile is dark brownish gray, dark brown, or a shade lighter or darker than these colors, and it may have few to many mottles.

TABLE 1.—*Approximate acreage and proportional extent of soils*

Soil	Area [1]	Extent
	Acres	*Percent*
Bowdre silty clay loam, 0 to 1 percent slopes	3, 601	0. 9
Bowdre silty clay loam, gently undulating	5, 055	1. 2
Calloway silt loam, 0 to 1 percent slopes	10, 886	2. 6
Calloway silt loam, 1 to 3 percent slopes	4, 881	1. 2
Calloway-Grenada silt loams, 0 to 3 percent slopes	368	. 1
Calloway-Henry silt loams, 0 to 2 percent slopes	1, 837	. 4
Commerce silty clay loam	4, 652	1. 1
Commerce loam	11, 136	2. 7
Dundee silt loam, 0 to 1 percent slopes	3, 640	. 9
Dundee silt loam, gently undulating	836	. 2
Gallion fine sandy loam, 1 to 3 percent slopes	1, 279	. 3
Gallion silt loam, 0 to 1 percent slopes	4, 067	1. 0
Gallion silt loam, 1 to 3 percent slopes	1, 279	. 3
Gallion and Pulaski fine sandy loams, 0 to 1 percent slopes	4, 403	1. 1
Grenada silt loam, 0 to 1 percent slopes	1, 099	. 3
Grenada silt loam, 1 to 3 percent slopes	3, 123	. 8
Grenada silt loam, 1 to 3 percent slopes, eroded	2, 907	. 7
Grenada silt loam, 3 to 8 percent slopes	402	. 1
Grenada silt loam, 3 to 8 percent slopes, eroded	2, 873	. 7
Grenada silt loam, 8 to 12 percent slopes, eroded	530	. 1
Gullied land	500	. 1
Hebert and Crowley silt loams	10, 689	2. 6
Henry silt loam	16, 776	4. 0
Lonoke silt loam	1, 693	. 4
McGehee silt loam, 0 to 1 percent slopes	6, 061	1. 5
McGehee silt loam, gently undulating	380	. 1
Mixed alluvial land	38, 259	9. 2
Perry clay, 0 to 1 percent slopes	122, 693	29. 6
Perry clay, gently undulating	3, 410	. 8
Perry silt loam, overwash	839	. 2
Portland clay, 0 to 1 percent slopes	19, 033	4. 6
Portland clay, gently undulating	1, 299	. 3
Robinsonville loam, gently undulating	2, 417	. 6
Sharkey clay, 1 to 3 percent slopes	77, 513	18. 7
Sharkey clay, gently undulating	15, 585	3. 8
Waverly silt loam	6, 100	1. 5
Total land area	392, 101	94. 7
Water areas	19, 806	4. 8
Levee	2, 173	. 5
Total area of county	414, 080	100. 0

[1] Area measurement is by Cartographic Division, Soil Conservation Service, Fort Worth, Texas.

Adjacent to Bowdre soils in Chicot County are the well-drained Robinsonville soils, moderately well drained Commerce soils, and poorly drained Sharkey soils.

The available moisture capacity of Bowdre soils is medium or high. Most of the acreage is in soybeans, cotton, or pasture. Yields are good if the soils are properly managed.

Bowdre silty clay loam, 0 to 1 percent slopes (BoA).—The surface layer of this soil is about 6 inches of very dark grayish-brown silty clay loam. The upper part of the subsoil is very dark grayish-brown clay, and the lower part is brown silt loam mottled with yellowish brown. Below the subsoil is loamy sand.

Included with this soil in mapping were small spots of well-drained Robinsonville soils, moderately well drained Commerce soils, and poorly drained Sharkey soils.

Runoff is slow on this Bowdre soil, and the hazard of erosion is slight. The available moisture capacity is medium to high, and permeability is moderately slow. This soil is low in nitrogen, medium in potassium, and high in phosphorus. The loamy sand in the lower part of the profile restricts use of this soil for rice or other water-cultured crops. If properly managed, this soil is good for cotton, soybeans, and pasture. (Capability unit IIw–1)

Bowdre silty clay loam, gently undulating (BoU).—The surface layer of this soil is very dark grayish-brown silty clay loam, about 6 inches thick. The upper part of the subsoil is very dark grayish-brown clay, and the lower part is brown silt loam mottled with yellowish brown. Below the subsoil is loamy sand.

Small spots of well-drained Robinsonville soils, moderately well drained Commerce soils, and poorly drained Sharkey soils were included with this soil in mapping.

Runoff is rapid on the rises and slow in the low places between them. Erosion is a moderate hazard. This soil is low in nitrogen, medium in potassium, and high in phosphorus. The undulations and the loamy sand in the lower part of its profile restrict the use of this soil for rice or other water-cultured crops. If properly managed, this soil is fair to good for cotton, soybeans, and pasture. (Capability unit IIIw–5)

Calloway Series

This series consists of level and nearly level, strongly acid and very strongly acid, somewhat poorly drained soils that developed in thick deposits of windblown silt. These soils have a fragipan that restricts the movement of water and the penetration of roots. This is a representative profile:

0 to 8 inches, dark grayish-brown, friable silt loam.
8 to 15 inches, pale-brown, friable silt loam.
15 to 21 inches, light brownish-gray, compact, brittle silt loam; yellowish-brown and gray mottles. (Fragipan.)
21 to 49 inches, gray silt loam to silty clay loam; strong-brown mottles.

The surface layer ranges from 6 to 10 inches in thickness. The depth to the fragipan ranges from 14 to 24 inches.

In Chicot County, Calloway soils occur throughout Macon Ridge, an area of thick loess (5 to 10 feet) in the south-central part of the county. Adjacent to these soils are moderately well drained Grenada soils and poorly drained Henry soils.

Calloway soils are in good tilth and can easily be kept that way. Their available moisture capacity is very high. Most of their acreage is in pasture, cotton, soybeans, or oats. Yields are fair if management is good.

Calloway silt loam, 0 to 1 percent slopes (CaA).—The surface layer of this soil is dark grayish-brown silt loam about 10 inches thick. The subsoil is pale-brown silt loam. A compact, brittle fragipan is at a depth of 14 to 24 inches. It is silt loam in the upper part and silty clay loam in the lower part. Its color is light brownish gray mottled with gray.

Included in the mapped areas of this soil are small spots of moderately well drained Grenada soils and poorly drained Henry soils.

Runoff is slow on this Calloway soil, and the hazard of erosion is slight. The available moisture capacity is very high, and permeability is moderate or moderately slow. This soil is in good tilth and can easily be kept that way. It is low in nitrogen, phosphorus, and potassium. The fragipan limits the depth of the root zone and impedes the movement of water. If properly managed, this is a fair soil for cotton, soybeans, oats, and lespedeza. (Capability unit IIw–2)

Calloway silt loam, 1 to 3 percent slopes (CaB).—The surface layer of this soil is a dark grayish-brown silt loam about 8 inches thick. The subsoil is pale-brown silt loam. A compact, brittle fragipan is at a depth of 14 to 24 inches. This layer is silt loam in the upper part and silty clay loam in the lower part. Its color is light brownish gray mottled with gray.

Included in the mapped areas of this soil are small spots of moderately well drained Grenada soils and poorly drained Henry soils.

Runoff is medium on this Calloway soil, and erosion is a moderate hazard. The available moisture capacity is very high, and permeability is moderate or moderately slow. This soil is in good tilth and can easily be kept that way. It is low in nitrogen, phosphorus, and potassium. The depth of the root zone is limited by the fragipan. Root penetration and water movement are restricted within the fragipan. If well managed, this soil is good for cotton, soybeans, oats, and lespedeza. (Capability unit IIw–2)

Calloway-Grenada silt loams 0 to 3 percent slopes (CGB).—This mapping unit consists of Calloway silt loam and Grenada silt loam in such an intricate pattern that separation is not practical on a map of the scale used. The soils of this complex are essentially the same as the Calloway silt loams and the Grenada silt loams that were mapped separately.

Most of this complex is in soybeans, cotton, oats, or pasture. Yields are fair if management is good. (Capability unit IIw–2)

Calloway-Henry silt loams 0 to 2 percent slopes (CHA).—This mapping unit consists of about 50 percent Calloway silt loam and about 50 percent Henry silt loam in such an intricate pattern that separation was not practical on a map of the scale used. These soils have essentially the same characteristics as the Calloway silt loams and the Henry silt loam that were mapped separately and that are described elsewhere in this report.

Most of this complex is used for soybeans, cotton, or pasture. Yields are fair to good if management is good. (Calloway silt loam, capability unit IIw–2; Henry silt loam, capability unit IIIw–3)

Commerce Series

The soils in the Commerce series developed from Mississippi River alluvium. They are level, slightly acid to mildly alkaline, and moderately well drained. The following is a representative profile:

0 to 6 inches, dark grayish-brown, very friable loam; granular structure.
6 to 22 inches, grayish-brown, friable loam; subangular blocky structure.
22 to 55 inches, grayish-brown, very friable silt loam; subangular blocky structure.

The surface layer ranges from grayish brown to dark brown in color and from loam to silty clay loam in texture. The subsoil ranges from light gray to very dark grayish brown in color and from silt to silty clay loam in texture. It has thin lenses of clay in the lower part.

Adjacent to Commerce soils in Chicot County are well-drained Robinsonville soils, moderately well drained Bowdre soils, somewhat poorly drained Dundee soils, and poorly drained Sharkey soils.

The available moisture capacity of Commerce soils is very high, and permeability is moderate or moderately slow. The organic-matter content is low or medium. Most of the acreage is in soybeans, cotton, or pasture. Yields are favorable if the soils are well managed.

Commerce silty clay loam (Cm).—The surface layer of this soil is about 6 inches of dark grayish-brown silty clay loam. The upper part of the subsoil is dark grayish-brown silty clay loam that has brown mottles, and the lower part is grayish silt loam that has brown and dark grayish-brown mottles.

Included in a few of the mapped areas of this soil are small spots of moderately well drained Bowdre soils and poorly drained Sharkey soils.

The available moisture capacity of this soil is medium or high; permeability is moderately slow; and the content of organic matter is medium. This soil is medium in potassium and high in phosphorus. If properly managed, it is a good producer of cotton, soybeans, Coastal bermudagrass, and common bermudagrass. (Capability unit IIw–1)

Commerce loam (Co).—The surface layer of this soil is about 6 inches of dark grayish-brown loam. The subsoil is grayish-brown loam that has yellowish-brown and brown mottles.

Included in the mapped areas of this soil are small spots of well-drained Robinsonville soils and somewhat poorly drained Dundee soils.

The available moisture capacity of this Commerce soil is very high, permeability is moderate, and the organic-matter content is low. This soil is medium in potassium and high in phosphorus. Under good management, it is an excellent soil for cotton, soybeans, Coastal bermudagrass, common bermudagrass, and white clover. (Capability unit I-1)

Crowley Series

The soils in this series developed from old alluvium deposited by the Mississippi and Arkansas Rivers. They are level, strongly acid to neutral, and poorly drained or somewhat poorly drained. This is a representative profile:

- 0 to 16 inches, grayish-brown, friable silt loam.
- 16 to 22 inches, light brownish-gray, friable silt loam to silty clay loam.
- 22 to 36 inches, light brownish-gray, firm silty clay mottled with reddish brown.
- 36 to 42 inches, light brownish-gray clay or stratified sandy loam and clay.

The surface layer ranges from dark gray to grayish brown and is mottled in some places. The subsoil, in places, is gray or shades of brownish gray mottled with reddish brown to red. Its texture is clay or silty clay, and its reaction is medium acid or strongly acid.

In Chicot County, Crowley soils were mapped only with Hebert soils as an undifferentiated soil group. Both soils are similar enough in behavior that their separation was not important for the objectives of this survey.

Adjacent to Crowley soils in this county are well-drained Gallion soils and Lonoke soils and somewhat poorly drained McGehee soils.

The available moisture capacity of Crowley soils is medium or high, permeability is slow, and the organic-matter content is low or medium. Cotton, soybeans, and pasture grasses are the chief crops. Yields are good if the soils are properly managed.

Dundee Series

The soils in the Dundee series developed from Mississippi River alluvium. They are level to gently undulating, medium acid to moderately alkaline, and somewhat poorly drained. The following is a representative profile:

- 0 to 6 inches, dark grayish-brown, friable silt loam; granular structure.
- 6 to 13 inches, dark grayish-brown, friable loam; angular blocky structure.
- 13 to 20 inches, dark grayish-brown, firm silty clay loam; subangular blocky structure.
- 20 to 49 inches, grayish-brown, friable silt loam; subangular blocky structure.
- 49 to 72 inches, dark-gray, very firm, plastic silty clay.

The color of the surface layer ranges from light brownish gray to very dark grayish brown. The depth to the third layer ranges from 10 to 20 inches, and the color of this third layer ranges from yellowish brown to very dark grayish brown. The texture generally is silty clay loam, sandy clay, or sandy clay loam. In some profiles, very thin lenses of clay are present. The color of the lower part of the subsoil ranges from pale brown to dark gray. In some places, mottles do not occur in the upper part of the subsoil, but they are always present in the lower part.

Adjacent to Dundee soils in Chicot County are Bowdre soils and Commerce soils, both of which are moderately well drained.

The available moisture capacity of Dundee soils is very high, permeability is moderately slow, and the organic-matter content is low or medium. The content of potassium is medium, and that of phosphorus is high. Most of the acreage is in soybeans, cotton, or pasture. Yields are favorable if the soils are well managed.

Dundee silt loam, 0 to 1 percent slopes (DnA).—The surface layer of this soil is about 6 inches of dark grayish-brown silt loam. The upper part of the subsoil is dark grayish-brown loam, and the lower part is silty clay loam. The layer immediately below the subsoil is grayish-brown silt loam.

Small spots of moderately well drained Bowdre and Commerce soils were included with this soil in mapping.

The available moisture capacity of this soil is very high, and permeability is moderately slow. The content of organic matter is low, that of potassium is medium, and that of phosphorus is high. Most of the acreage is in cotton, soybeans, or pasture. Yields are favorable if management is good. (Capability unit IIw-3)

Dundee silt loam, gently undulating (DnU).—This soil is on short slopes. It has a 6-inch surface layer of dark grayish-brown silt loam. The upper part of its subsoil is dark grayish-brown loam, and the lower part is silty clay loam. Immediately below the subsoil is a layer of grayish-brown silt loam.

Small spots of moderately well drained Bowdre and Commerce soils were included with this soil in mapping.

The available moisture capacity of this soil is very high, and permeability is moderately slow. The content of organic matter is low, that of potassium is medium, and that of phosphorus is high. Most of the acreage is in cotton, soybeans, or pasture. Yields are favorable if management is good. (Capability unit IIIw-4)

Gallion Series

The soils in this series developed from Arkansas River alluvium. They are level or nearly level, medium acid to very strongly acid, and well drained. The following is a representative profile:

- 0 to 8 inches, dark-brown, very friable silt loam; granular structure.
- 8 to 19 inches, brown, friable silt loam; angular blocky structure.
- 0 to 8 inches, dark-brown, very friable silt loam; granular blocky structure.
- 26 to 39 inches, yellowish-red, friable silty clay loam; subangular blocky structure.
- 39 to 72 inches, light-brown, very friable silt loam.

The surface layer and the upper part of the subsoil (second layer) are brown to dark brown. The lower part of the subsoil (third and fourth layers) is reddish-brown or yellowish-red silt loam, sandy clay loam, silty clay loam, or sandy clay and has lenses of clay. The layer below the subsoil is silt loam or fine sandy loam. In some profiles, a few mottles are noticeable in this layer.

Adjacent to Gallion soils in Chicot County are somewhat poorly drained Hebert and McGehee soils.

The available moisture capacity of Gallion soils is very high, and permeability is moderate. The organic-matter content is low, and fertility is low. These soils can be cultivated throughout a wide range of moisture content without clodding or crusting. Generally, the depth of the root zone is not restricted, but a plowpan forms if the soils are plowed to the same depth for a long period. If properly managed, these soils are good to excellent for cotton, soybeans, and pasture grasses.

Gallion fine sandy loam, 1 to 3 percent slopes (GaB).—This soil has a surface layer, about 8 inches thick, of dark-brown fine sandy loam. The upper part of its subsoil is brown fine sandy loam, and the lower part is reddish-brown to yellowish-red silty clay loam. The subsoil is underlain by light-brown fine sandy loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Hebert and McGehee soils.

The available moisture capacity of this soil is very high, and permeability is moderate. The organic-matter content is low, and fertility is medium. This soil can be cultivated throughout a wide range of moisture content without clodding or crusting. If plowed to the same depth for a long period, it develops a plowpan. The depth of the root zone is restricted only where a plowpan has formed. Erosion is a hazard because this soil is on short slopes. Most of the acreage is in soybeans, cotton, or pasture. Yields are good if proper management is applied. (Capability unit IIe-1)

Gallion silt loam, 0 to 1 percent slopes (GnA).—This soil has a dark-brown silt loam surface layer that is about 8 inches thick. The upper part of its subsoil is brown silt loam, and the lower part is reddish-brown to yellowish-red silty clay loam. The subsoil is underlain by light-brown silt loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Hebert and McGehee soils.

The available moisture capacity of this soil is very high, and permeability is moderate. The organic-matter content is low, and fertility is medium. This soil can be cultivated throughout a wide range of moisture content without clodding or crusting. If plowed to the same depth year after year, it develops a plowpan that restricts the depth of the root zone. Erosion is not a hazard or is only a slight hazard. Under good management, this soil is excellent for cotton, soybeans, and pasture grasses. (Capability unit I-1)

Gallion silt loam, 1 to 3 percent slopes (GnB).—This soil has a dark-brown silt loam surface layer that is about 8 inches thick. The upper part of the subsoil is brown silt loam, and the lower part is reddish-brown to yellowish-red silty clay loam. The subsoil is underlain by light-brown silt loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Hebert and McGehee soils.

The available moisture capacity of this soil is very high, and permeability is moderate. The organic-matter content is low, and fertility is medium. This soil can be cultivated throughout a wide range of moisture content without clodding or crusting. If plowed to the same depth year after year, it develops a plowpan that restricts the growth of plant roots. Erosion is a hazard because this soil is on short slopes. Most of the acreage is in soybeans, cotton, or pasture. Yields are good if proper management is applied. (Capability unit IIe-1)

Gallion and Pulaski fine sandy loams, 0 to 1 percent slopes (GPA).—Gallion fine sandy loam and Pulaski fine sandy loam make up this mapping unit, which is called an undifferentiated soil group. These soils were mapped together because they are very similar in behavior, and each occurs in a pattern so intricate that separation was not practical on a map of the scale used. Generally, both soils occur in each of the mapped areas of this unit, but the Gallion soil is dominant.

The surface layer of these soils is brown to dark brown and is about 8 inches thick. The subsoil is yellowish red to reddish brown. The subsoil of the Gallion soil is finer textured than that of the Pulaski soil.

Included with these soils in mapping were small spots of Hebert soils and McGehee soils, both of which are somewhat poorly drained.

The available moisture capacity of Gallion and Pulaski fine sandy loams is very high, and permeability is moderate. The organic-matter content is low, and fertility is medium. These soils can be cultivated throughout a wide range of moisture content without clodding or crusting. If plowed to the same depth year after year, they develop a plowpan that restricts the growth of plant roots. Most of the acreage is in soybeans, cotton, or pasture. Yields are good if proper management is applied. (Capability unit I-1) (Additional information about Pulaski soils is given in the description of the Pulaski series.)

Grenada Series

This series consists of soils that developed from Mississippi Valley loess. These soils have a fragipan at a depth of 20 to 28 inches. They are nearly level to sloping, medium acid to very strongly acid, and moderately well drained. The following is a representative profile:

0 to 3 inches, dark-brown, friable silt loam; granular structure.
3 to 10 inches, brown, friable silt loam; granular structure.
10 to 25 inches, brown, friable light silty clay loam; blocky structure.
25 to 41 inches, light yellowish-brown, compact, brittle silt loam mottled with gray and dark yellowish brown. (Upper part of fragipan.)
41 to 58 inches, light brownish-gray, compact, brittle light silty clay loam mottled with gray and dark yellowish brown. (Lower part of fragipan.)

The loess that overlies the unconforming material is 5 to 10 feet thick. Silt loam is the only soil type in this series.

Adjacent to Grenada soils in Chicot County are somewhat poorly drained Calloway soils and poorly drained Henry soils.

Grenada soils are in good tilth and can easily be kept that way. The available moisture capacity of these soils is very high, the organic-matter content is low in other than virgin soil, and fertility is low or medium. Most of the acreage is in pasture, cotton, or soybeans. Yields are fair to good if proper management is applied.

Grenada silt loam, 0 to 1 percent slopes (GrA).—This soil has a dark-brown silt loam surface layer that is about 3 inches thick. It has a brown subsoil and, at a depth of 20 to 28 inches, a light yellowish-brown, compact, brittle fragipan that is mottled with gray and dark yellowish brown. The upper part of the fragipan is silt loam, and the lower part is silty clay loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Calloway soils and poorly drained Henry soils.

This soil is in good tilth and can easily be kept that way. The available moisture capacity is very high, the content of organic matter is low in other than virgin soil, and fertility is low or medium. Most of the acreage is in pasture, cotton, or soybeans. Yields are fair to good if proper management is applied. (Capability unit IIw-2)

Grenada silt loam, 1 to 3 percent slopes (GrB).—This soil has a dark-brown silt loam surface layer that is about 3 inches thick. It has a brown subsoil and, at a depth of 20 to 28 inches, a light yellowish-brown, compact, brittle fragipan that is mottled with gray and dark yellowish brown. The upper part of the fragipan is silt loam, and the lower part is silty clay loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Calloway soils and poorly drained Henry soils.

This soil is in good tilth and can easily be kept that way. The available moisture capacity is very high; the organic-matter content is low, except in virgin soil; and fertility is low or medium. Erosion is a moderate hazard. Most of the acreage is in pasture, cotton, or soybeans. Yields are fair to good if proper management is applied. (Capability unit IIe-2)

Grenada silt loam, 1 to 3 percent slopes, eroded (GrB2).—This soil has a brown silt loam surface layer. It has a brown subsoil and, at a depth of 20 to 28 inches, a light yellowish-brown, compact, brittle fragipan that is mottled with gray and dark yellowish brown. The upper part of the fragipan is silt loam, and the lower part is silty clay loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Calloway soils and poorly drained Henry soils.

This soil is in good tilth and can easily be kept that way. The available moisture capacity is very high, the organic-matter content is low, and fertility is low. Most of the acreage is in pasture, cotton, or soybeans. Yields are fair if management is good. (Capability unit IIe-2)

Grenada silt loam, 3 to 8 percent slopes (GrC).—This soil has a brown silt loam surface layer. It has a brown subsoil and, at a depth of 20 to 28 inches, a light yellowish-brown, compact, brittle fragipan that is mottled with gray and dark yellowish brown. The upper part of the fragipan is silt loam, and the lower part is silty clay loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Calloway soils and poorly drained Henry soils.

This soil is in good tilth, and it has a very high available moisture capacity. Erosion is a moderately severe hazard because of the gently sloping relief. Most of the acreage is in pasture, cotton, or soybeans. Yields are fair if management is good. (Capability unit IIIe-1)

Grenada silt loam, 3 to 8 percent slopes, eroded (GrC2).—This soil has a brown silt loam surface layer, brown subsoil, and at a depth of 20 to 25 inches, a light yellowish-brown, compact, brittle fragipan that is mottled with gray and dark yellowish brown. The upper part of the fragipan is silt loam, and the lower part is silty clay loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Calloway soils and poorly drained Henry soils.

The available moisture capacity of this soil is very high. The organic-matter content is low, and fertility is low. Most of the acreage is in pasture, cotton, or soybeans. Yields are fair if management is good. (Capability unit IIIe-1)

Grenada silt loam, 8 to 12 percent slopes, eroded (GrD2).—This soil has a surface layer and a subsoil of brown silt loam. At a depth of 20 to 25 inches it has a light yellowish-brown, compact, brittle fragipan that is mottled with gray and dark yellowish brown. The upper part of the fragipan is silt loam, and the lower part is silty clay loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Calloway soils and poorly drained Henry soils.

The available moisture capacity of this soil is very high. The organic-matter content is low, and fertility is low. Most of the acreage is in pasture, cotton, or soybeans. Yields are fair if management is good. (Capability unit IVe-1)

Gullied Land

Gullied land (Gu) is a miscellaneous land type that occurs on long, narrow escarpments where Macon Ridge breaks to the bottom lands that lie east of the ridge. The slope is as much as 20 percent. This land type is characterized by a network of gullies of varying depth and size. Only small areas of the original soils (chiefly Grenada and Calloway soils) remain between the gullies.

The soil material is of loessal origin. It varies in texture and consistence. It is very strongly acid and somewhat poorly drained or moderately well drained.

Gullied land can be used, to a limited extent, for pasture but is not suitable for cultivation. Most of the acreage is in pasture or is wooded, and some is reverting to woods. (Capability unit VIIe-1)

Hebert Series

The soils in this series developed from Arkansas River alluvium. They are level, slightly acid to strongly acid, and somewhat poorly drained. The following is a representative profile:

0 to 16 inches, grayish-brown, friable silt loam.
16 to 31 inches, grayish-brown, friable or firm silty clay loam mottled with strong brown; blocky structure.
31 to 45 inches, grayish-brown, friable fine sandy loam mottled with reddish brown.

The surface layer ranges from brown to shades of gray, and in some places it is mottled. This layer is 4 to 22 inches thick. The subsoil ranges from yellowish red to reddish brown and has reticulations of gray and brown, or it may be mottled brown, yellowish red, or grayish brown. This layer is sandy clay loam, silty clay loam, or clay loam. The layer immediately below the subsoil is brown to reddish brown silt loam, sandy loam, or stratified sand, silt, and clay.

Adjacent to Hebert soils in Chicot County are well-drained Gallion and Lonoke soils, somewhat poorly drained McGehee soils, and poorly drained or somewhat poorly drained Crowley soils.

The available moisture capacity of Hebert soils is high, permeability is moderately slow, and the organic-matter content is low or medium. These soils are not likely to clod or crust when plowed, but they develop a plowpan if plowed to the same depth year after year.

Cotton, soybeans, and pasture grasses are the chief crops. Yields are good if proper management is applied.

Hebert and Crowley silt loams (HC).—Hebert silt loam and Crowley silt loam make up this mapping unit, which is called an undifferentiated soil group. These soils were mapped together because their differences are insignificant, and each occurs in such an irregular pattern that separation was not practical on a map of the scale used. One soil or the other, or both, occur in each of the mapped areas of this unit.

The surface layer of the Hebert soil is brown silt loam; it is about 8 inches thick. The upper part of the subsoil is light brownish-gray silty clay loam, and the lower part is reddish-brown silty clay loam. Below the subsoil is reddish-brown silt loam or very fine sandy loam.

Crowley silt loam has a dark gray to grayish brown surface layer and a subsoil of light brownish-gray silty clay or clay that is mottled with red or reddish brown.

Included with these soils in mapping were small spots of well-drained Gallion and Lonoke soils and somewhat poorly drained McGehee soils.

The available moisture capacity of Hebert and Crowley silt loams is moderate to high, and permeability is slow or moderately slow. The organic-matter content is medium or low, and fertility is medium. Erosion is a slight hazard is some places. These soils are slightly wet but are not likely to clod or crust when plowed. If plowed to the same depth year after year, however, they develop a plowpan. Most of the acreage is in cotton, soybeans, or pasture. Yields are good if proper management is applied. (Capability unit IIw-3)

Henry Series

This series consists of poorly drained, strongly acid or very strongly acid soils that formed in thick deposits of loess. These soils have a firm to extremely firm fragipan. They occur in depressions or in level areas. The following is a representative profile:

0 to 13 inches, dark-gray to light-gray, friable silt loam; blocky structure.
13 to 29 inches, light-gray, firm, brittle silty clay loam to silt loam.
29 to 42 inches, light brownish-gray, compact, brittle silty clay loam.
42 to 72 inches, gray, compact, brittle silt loam.

The loess that overlies the unconforming material is 5 to 10 feet thick. The fragipan is at a depth that ranges from 10 to 30 inches, but more commonly it is at the lower part of this range.

In Chicot County, moderately well drained Grenada soils and somewhat poorly drained Calloway soils are adjacent to Henry soils.

The available moisture capacity of Henry soils is high, and permeability is slow. The organic-matter content is low, except in virgin soil, and fertility is low. The thick fragipan restricts the growth of roots and the movement of water. These soils are wet in winter and in spring.

Henry silt loam (He).—The surface layer of this soil is light-gray to dark-gray silt loam and is about 13 inches thick. It is underlain by a mottled, compact, brittle fragipan. The upper part of the fragipan is light-gray silty clay loam. This part is underlain by light brownish-gray silty clay loam that, in turn, is underlain by gray silt loam.

Included in the mapped areas of this soil are small spots of moderately well drained Grenada soils and somewhat poorly drained Calloway soils.

The available moisture capacity of this soil is high, and permeability is slow. The organic-matter content is low, and fertility is low. The thick fragipan restricts the growth of roots and the movement of water. This soil is wet in winter and in spring. (Capability unit IIIw-3)

Lonoke Series

The soils in the Lonoke series are level, slightly acid to strongly acid, and well drained. They formed in Arkansas River alluvium. The following is a representative profile:

0 to 12 inches, dark-brown, friable silt loam; granular or blocky structure.
12 to 18 inches, dark-brown, friable silt loam; blocky structure.
18 to 57 inches, yellowish-red, friable silt loam; blocky structure.

The color of the surface layer ranges from dark brown to dark grayish brown; that of the subsoil, from brown to very dark grayish brown; and that of the layer immediately below the subsoil, from dark brown and yellowish red to reddish brown. This lower layer is mottled with gray or pale brown in some places.

Adjacent to Lonoke soils in Chicot County are well-drained Gallion soils and somewhat poorly drained Hebert soils.

The available moisture capacity of Lonoke soils is very high, and permeability is moderate. The organic-matter content is medium, and natural fertility is medium. Tilth is good and is easily maintained, but a plowpan forms if the soils are cultivated to the same depth year after year.

Lonoke silt loam (Lo).—The surface layer of this soil is dark-brown silt loam and is about 12 inches thick. The subsoil also is dark-brown silt loam. It is underlain by yellowish-red silt loam.

Small spots of well-drained Gallion soils and of somewhat poorly drained Hebert soils were included with this soil in mapping.

The available moisture capacity of this soil is very high, and permeability is moderate. The content of organic matter is medium, and natural fertility is medium. This soil is easy to till and is easily kept in good tilth. A plowpan forms, however, if the soil is cultivated to the same depth year after year. (Capability unit I-1)

McGehee Series

The soils in this series formed in alluvium deposited by the Arkansas River. They are level to gently undulating, medium acid or strongly acid, and somewhat poorly drained. The following is a representative profile:

0 to 6 inches, dark-brown, very friable silt loam; granular structure.
6 to 14 inches, pale-brown, friable silt loam; granular to blocky structure.
14 to 19 inches, light brownish-gray, very friable silt loam.
19 to 26 inches, reddish-brown silt loam to silty clay loam; blocky structure.

26 to 42 inches, reddish-brown, very firm silty clay loam to silty clay; blocky structure.
42 to 53 inches, very dark gray, firm silty clay or clay.

The surface layer may be pale brown, brown, dark brown, or gray to light brownish gray. The subsoil ranges from reddish brown to dark brown, strong brown, or red. In some places dark-gray clay is at a depth of 30 inches or more, and in many places the soil material at a depth of 30 inches or more is neutral or alkaline in reaction.

Adjacent to McGehee soils in Chicot County are somewhat poorly drained Hebert soils and Portland soils.

McGehee soils are slightly wet. They have a very high available moisture capacity and are slowly permeable. They have medium content of organic matter and are only moderately fertile. These soils can be cultivated throughout a wide range of moisture content without clodding or crusting. They develop a plowpan, however, if plowed to the same depth for a long period. Most of the acreage is in soybeans, cotton, or pasture. Yields are good if management is good.

McGehee silt loam, 0 to 1 percent slopes (McA).—This soil has a dark-brown silt loam surface layer that is about 6 inches thick. Immediately below the surface layer is pale-brown silt loam that grades to brownish-gray silt loam. The subsoil is reddish-brown silty clay loam that grades to gray clay.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Hebert and Portland soils.

This soil is slightly wet. The available moisture capacity is very high, and permeability is slow. The organic-matter content is medium, and fertility is medium. This soil can be cultivated throughout a wide range of moisture content without clodding or crusting. A plowpan forms, however, if the soil is plowed to the same depth for a long period. Most of the acreage is in soybeans, cotton, or pasture. Yields are good if proper management is applied. (Capability unit IIw-3)

McGehee silt loam, gently undulating (McU).—This soil has a 6-inch surface layer of dark-brown silt loam. It has a subsurface layer of pale-brown silt loam and below that, a layer of light brownish-gray silt loam. The subsoil is reddish-brown silty clay loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Hebert and Portland soils.

This soil is slightly wet. The available moisture capacity is very high, and permeability is slow. The organic-matter content is medium, and fertility is medium. This soil can be cultivated throughout a wide range of moisture content without clodding or crusting. It develops a plowpan, however, if plowed to the same depth for a long period. Most of the acreage is in soybeans, cotton, or pasture. Yields are good if proper management is applied. (Capability unit IIIw-4)

Mixed Alluvial Land

Mixed alluvial land (Mu) is a miscellaneous land type that occurs in unprotected level areas between the Mississippi River and the levee along the river.

The soil material is alluvial in origin. It is slightly acid to alkaline and is excessively drained to poorly drained. It cannot be classified as to texture, because frequent overflows change the material from year to year. The sequence and texture of the layers vary, even within a few feet.

Most areas are wooded or are in pasture. Yields are good if proper management is applied. (Capability unit Vw-1)

Perry Series

The soils in the Perry series formed in Arkansas River alluvium. They are level to gently undulating, medium acid or strongly acid, and poorly drained. The following is a representative profile:

0 to 5 inches, dark-gray, very firm clay; blocky structure.
5 to 10 inches, dark-gray, very firm clay; blocky structure.
10 to 19 inches, gray, very firm clay; blocky structure.
19 to 25 inches, mottled gray and reddish-brown, very firm clay; blocky sructure.
25 to 42 inches, reddish-brown, very firm clay; blocky structure.

The color of both the surface layer and the subsoil ranges from gray to dark gray. The upper part of the subsoil is grayish and generally is acid; the lower part is reddish and is neutral to alkaline. This part of the subsoil has common or many slickensides. The depth to the reddish clay ranges from 19 to 42 inches. The mottles vary widely in size, number, and contrast. They are yellowish brown, reddish brown, or other shades of brown and red.

Adjacent to Perry soils in Chicot County are somewhat poorly drained Hebert soils and poorly drained Sharkey soils.

The available moisture capacity of Perry soils is medium or high, and permeability is very slow. The organic-matter content is medium or low, and fertility is medium or high. These soils are difficult to maintain in good tilth and are likely to clod or crust if plowed at a time other than when they are most friable. They are excellent soils for rice. Most areas are in rice, soybeans, cotton, or pasture. Yields are good if the soils are properly managed.

Perry clay, 0 to 1 percent slopes (PeA).—This soil has a dark-gray surface layer that is about 10 inches thick. The upper part of its subsoil is gray clay, and the lower part is reddish-brown clay.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Hebert soils and poorly drained Sharkey soils.

The available moisture capacity of this soil is medium or high, the organic-matter content is medium or low, and fertility is medium or high. This soil is difficult to maintain in good tilth and can be cultivated without clodding or crusting only during the short period when its moisture content is favorable. It is an excellent soil for rice (fig. 2). Most of the acreage is in rice, soybeans, cotton, or pasture. Yields are good if proper management is applied. (Capability unit IIIw-1)

Perry clay, gently undulating (PeU).—This soil has a dark-gray surface layer that is about 10 inches thick. The upper part of its subsoil is gray clay, and the lower part is reddish-brown clay.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Hebert soils and poorly drained Sharkey soils.

This soil has short slopes and is subject to erosion. Its available moisture capacity is medium or high, its organic-

Figure 2.—**Emerging rice on Perry clay, 0 to 1 percent slopes, an excellent soil for this crop. Generally, the yield is 106 bushels per acre.**

matter content is medium or low, and its fertility is medium or high. This soil is difficult to maintain in good tilth, and can be plowed without clodding or crusting only during the limited period when its moisture content is favorable. Most of the acreage is in soybeans, cotton, or pasture. Yields are good if proper management is applied. (Capability unit IIIw–2)

Perry silt loam, overwash (Pr).—This soil has a 6-inch surface layer of dark grayish-brown silt loam. The upper part of its subsoil is gray clay, and the lower part is reddish-brown clay.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Hebert soils and poorly drained Sharkey soils.

The available moisture capacity of this soil is medium or high, the organic-matter content is medium or low, and fertility is medium or high. This soil is easier to work and to keep in good tilth than Perry clay. It does not crust and crack so readily. It is a good soil for rice, soybeans, cotton (fig. 3), and pasture grasses but needs proper management. (Capability unit IIIw–1)

Portland Series

The soils in this series formed in Arkansas River alluvium. They are level to gently undulating and somewhat poorly drained. These soils are slightly acid or medium acid in the upper part and neutral or mildly alkaline in the lower part. The following is a representative profile:

- 0 to 4 inches, dark grayish-brown, very firm clay; blocky structure.
- 4 to 17 inches, reddish-brown, very firm, strongly acid clay; blocky structure.
- 17 to 72 inches, reddish-brown, very firm, alkaline clay; blocky structure.

The surface layer ranges from gray to dark brown. The second layer has common to many, medium or coarse, light brownish-gray and strong-brown mottles. The subsoil is brown, dark brown, strong brown, yellowish red, or reddish brown. It has common to many slickensides and few to common lime concretions. The upper part of the subsoil is slightly acid to strongly acid, and the lower part is neutral to alkaline.

Adjacent to Portland soils in Chicot County are somewhat poorly drained McGehee soils and poorly drained Perry soils.

The available moisture capacity of Portland soils is medium or high, and permeability is very slow. The organic-matter content is medium, except in virgin soil, and fertility is medium or high. These soils have a narrow optimum moisture range for cultivation and are difficult to maintain in good tilth. They are excellent soils for rice. Most of their acreage is in rice, soybeans, cotton, or pasture. Yields are good if proper management is applied.

Portland clay, 0 to 1 percent slopes (PtA).—The surface layer of this soil is dark grayish-brown clay; it is about 4 inches thick. The subsoil is reddish-brown clay. The upper part of the subsoil is strongly acid, and the lower part is mildly alkaline.

Included in the mapped areas of this soil are small spots of somewhat poorly drained McGehee soils and poorly drained Perry soils.

The available moisture capacity of this soil is medium or high, and permeability is very slow. The organic-matter content is medium, and fertility is medium or high. This soil is difficult to maintain in good tilth and has a narrow range of moisture content within which it can be cultivated. It is an excellent soil for rice. Most of the acreage is in rice, soybeans, cotton, or pasture. Yields are good if proper management is applied. (Capability unit IIIw–1)

Portland clay, gently undulating (PtU).—This soil has a dark grayish-brown surface layer that is about 4 inches thick. It has a reddish-brown clay subsoil that is strongly acid in the upper part and mildly alkaline in the lower part.

Included in the mapped areas of this soil are small spots of somewhat poorly drained McGehee soils and poorly drained Perry soils.

The available moisture capacity of this soil is medium or high, and permeability is very slow. The organic-matter content is medium, and fertility is medium or high. This soil has short slopes and is subject to erosion. It has a narrow optimum moisture range for cultivation and is hard to maintain in good tilth. Most of the acreage is in soybeans, cotton, or pasture. Yields are good if the soil is well managed. (Capability unit IIIw–2)

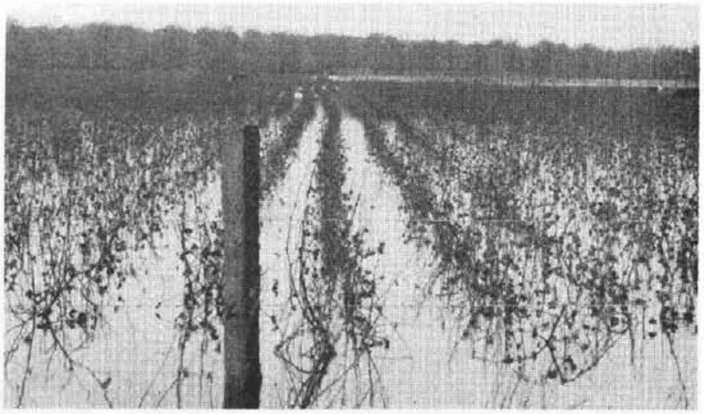

Figure 3.—**Cotton destroyed by flooding on Perry silt loam, overwash. The watershed program in Chicot County is providing drainage outlets for such poorly drained soils.**

Pulaski Series

The soils in this series formed in alluvium deposited by the Arkansas River. They are level, slightly acid or medium acid, and well drained. The following is a representative profile:

0 to 7 inches, dark-brown, very friable fine sandy loam; granular structure.
7 to 22 inches, brown, friable fine sandy loam; granular structure.
22 to 26 inches, reddish-brown, friable fine sandy loam; subangular blocky structure.
26 to 45 inches, yellowish-red, friable fine sandy loam; subangular blocky structure.

The lower part of the subsoil, in some places, is silt loam or light silty clay loam. It is underlain by fine sandy loam.

In Chicot County, Pulaski soils were mapped only with Gallion soils as an undifferentiated soil group. Both soils are similar enough in behavior so that their separation was not important for the objectives of this survey.

The available moisture capacity of Pulaski soils is very high, and permeability is moderate. The organic-matter content is low, and fertility is medium. These soils can be cultivated throughout a wide range of moisture content without clodding or crusting. If plowed to the same depth for a long period, however, they develop a plowpan that restricts the growth of plant roots. Most of the acreage is in cotton, soybeans, or pasture. Yields are favorable if management is good.

Robinsonville Series

The soils in this series formed in Mississippi River alluvium. They are gently undulating, slightly acid to moderately alkaline, and well drained. The following is a representative profile:

0 to 9 inches, dark grayish-brown, very friable loam; blocky structure.
9 to 34 inches, dark grayish-brown, very friable fine sandy loam; granular structure.
34 to 48 inches, dark grayish-brown, very fine sandy loam; granular structure.
48 to 60 inches, grayish-brown, loose sand; structureless.

The surface layer is light yellowish-brown to brown, fine sandy loam or loam. In some places, thin lenses of fine-textured material are at the surface. The subsoil is light yellowish brown to dark grayish brown.

Adjacent to Robinsonville soils in this county are moderately well drained Bowdre and Commerce soils.

The available moisture capacity of Robinsonville soils is high, and permeability is moderate. The organic-matter content is low, and fertility is medium. These soils can be cultivated throughout a wide range of moisture content without clodding or crusting. They develop a plowpan, however, if plowed to the same depth for a long period. In Chicot County, these soils are used mostly for cotton, soybeans, and pasture. Yields are good if proper management is applied.

Robinsonville loam, gently undulating (RoU).—The surface layer of this soil is dark grayish brown and is about 9 inches thick. The subsoil also is dark grayish brown, and the layer below that is grayish brown.

Included in the mapped areas of this soil are small spots of moderately well drained Bowdre and Commerce soils.

The available moisture capacity of this soil is high, and permeability is moderate. The content of organic matter is low, and fertility is medium. This soil can be cultivated throughout a wide range of moisture content without clodding or crusting. It develops a plowpan, however, if plowed to the same depth year after year. Most of the acreage is in cotton, soybeans, or pasture. Yields are good if proper management is applied. (Capability unit IIe–1)

Sharkey Series

The soils in this series formed in Mississippi River alluvium. They are nearly level to gently undulating, medium acid to moderately alkaline, and poorly drained. The following is a representative profile:

0 to 4 inches, very dark grayish-brown, firm clay; blocky structure.
4 to 48 inches, dark-gray, firm clay; blocky structure.

The surface layer ranges from very dark grayish brown to dark gray. The subsoil has yellowish-red or reddish-brown mottles in some places.

Adjacent to these soils in Chicot County are moderately well drained Bowdre soils and poorly drained Perry soils.

The available moisture capacity of Sharkey soils is medium or high, and permeability is very slow. The organic-matter content is medium, and fertility is medium or high. These soils are difficult to maintain in good tilth and have a narrow range of moisture content within which they can be cultivated. They are excellent soils for rice. Most of the acreage is in rice, soybeans, cotton, or pasture. Yields are good if the soils are well managed.

Sharkey clay, 1 to 3 percent slopes (ShA).—This soil has a very dark grayish-brown surface layer that is medium acid or slightly acid, and it has a dark-gray subsoil that is slightly acid to moderately alkaline.

Included in mapped areas of this soil are small spots of moderately well drained Bowdre soils and poorly drained Perry soils.

The available moisture capacity of this soil is medium or high, and permeability is very slow. The organic-matter content is medium, and fertility is medium or high. This soil is difficult to maintain in good tilth and has a narrow range of moisture content within which it can be cultivated. It is an excellent soil for rice. Most of it is used for rice, soybeans, cotton, and pasture. Yields are good if proper management is applied. (Capability unit IIIw–1)

Sharkey clay, gently undulating (ShU).—This soil has a very dark grayish-brown surface layer that is medium acid or slightly acid, a dark-gray subsoil that is slightly acid or neutral, and a dark-gray layer below the subsoil that is neutral to moderately alkaline.

Included in the mapped areas of this soil are small spots of moderately well drained Bowdre soils and poorly drained Perry soils.

The available moisture capacity of this soil is medium or high, and permeability is very slow. The organic-matter content is medium, and fertility is medium or high. This soil has short slopes and is subject to erosion. It is difficult to maintain in good tilth, and it is likely to clod or crust if plowed at a time other than when its moisture content is favorable. Most of this soil is in soybeans, cotton, and pasture. Yields are good if proper management is applied. (Capability unit IIIw–2)

Waverly Series

The soils in the Waverly series developed from medium-textured alluvium that is dominantly silty. These are strongly acid or very strongly acid, poorly drained soils in level or depressed areas. The following is a representative profile:

0 to 6 inches, light brownish-gray, friable silt loam; blocky structure.
6 to 30 inches, gray, friable silt loam; blocky structure.
30 to 59 inches, gray, friable silty clay loam to silt loam; blocky structure.

Both the surface layer and the subsoil may be any shade of gray mottled with various shades of brown.

Adjacent to these soils in Chicot County are somewhat poorly drained Calloway soils and poorly drained Henry soils.

The available moisture capacity of Waverly soils is very high. The organic-matter content is low or medium, and fertility is low. These soils are subject to frequent overflow. In winter and spring, the water table is normally high or near the surface. Water stands on the surface after a heavy rain. These soils are used mostly for woodland and for pasture. Pasture yields are fair, and timber yields are good if proper management is applied.

Waverly silt loam (Wa).—This soil consists of about 6 inches of light brownish-gray silt loam underlain by gray silt loam that, in turn, is underlain by gray silty clay loam.

Included in the mapped areas of this soil are small spots of somewhat poorly drained Calloway soils and poorly drained Henry soils.

This soil has a very high available moisture capacity. It contains low or medium amounts of organic matter and is low in fertility. It is subject to frequent overflow and therefore is used mostly as woodland and as pasture. If proper management is applied, yields from pasture are fair, and those from woodland are good. (Capability unit Vw–1)

Use of the Soils for Crops and Pasture[1]

This section has several parts. The first part discusses briefly general management of cropland and pasture. The second explains the capability classification system, and the third discusses use and management of the soils in each of the capability units. The last part gives estimated yields of the principal crops.

[1] WILSON FERGUSON, conservation agronomist, Soil Conservation Service, assisted in the preparation of this section.

General Management of Cropland and Pasture

Cropland.—Tillable soils in Chicot County require management practices that include use of a cropping system that returns large amounts of residue, use of proper tillage methods, fertilization, and liming. Sloping areas used intensively for clean-tilled crops require additional practices, including contour cultivation, terraces, and vegetated waterways. Short, undulating slopes, where contour cultivation and terraces are not practical, require cross-slope farming. Wetlands require row arrangement and drainage for dependable and economical production of crops. Rice-producing areas require irrigation, and other areas could benefit from this practice.

A cropping system is suitable if it helps to control erosion, to maintain or increase fertility and thereby increase production, and to improve the physical condition of the soil. Where only low-residue crops are grown or where the soils are subject to severe erosion, the cropping system should include cover crops or grasses and legumes.

If residue from crops is shredded and distributed evenly on the surface as a protective cover, it helps to maintain or improve the workability of the soil, the available moisture capacity, the nutrient-holding capacity, the organic-matter content, and the cation-exchange capacity.

A compact plowpan forms in medium-textured soils that are cultivated with heavy equipment year after year to the same depth. To prevent a plowpan from forming, these soils should be plowed when not too moist, and the depth to which they are plowed should be varied.

The kind and amount of fertilizer needed for optimum yields and for large amounts of residue can be determined by soil analyses, from fertilization and cropping histories, by study of the crops to be grown, and by study of yields obtained locally under comparable conditions.

Nitrogen fertilizer is needed on all but the newly cleared soils for all the locally grown crops except legumes. Phosphate and potash are needed for maximum production on almost all the soils in the loessal area. In the past, phosphate and potash have had little effect on most crops on the bottom lands of the Mississippi River. The response to phosphate and potash is expected to increase, however, if the use of nitrogen fertilizer in large amounts is continued.

Pasture.—About half of the acreage now in pasture is suited to row crops and can be used for row crops, but in rotation with pasture. The rest of the pastured acreage is on steep slopes adjacent to bottom lands and on moderately steep slopes in the Macon Ridge area. The levee along the Mississippi River is sodded to bermudagrass and is used for grazing.

Most long-range pasture programs are based on the use of perennial grasses and legumes. This combination usually includes either summer or winter perennial grasses grown with a suitable legume. Such mixtures increase the quality and quantity of the forage.

Well-adapted summer perennial grasses are common bermudagrass, Coastal bermudagrass, bahiagrass, dallisgrass, and johnsongrass. Tall fescue is presently the only suitable winter perennial grass. These grasses respond well to fertilizer, particularly to nitrogen, and to grazing-control practices. The kinds and amounts of fertilizer to use should be based on soil analyses, plants to be grown, forage needs, and fertilization and cropping histories. A soil analysis can be made by the Agricultural Extension Service in the county.

White clover, crimson clover, singletary peas, vetch, and annual lespedeza are the legumes suitable in permanent pasture.

Sudan grass and small grains are suitable for supplemental grazing. These can be used effectively to reduce grazing pressure on perennial grasses and legumes during critical or peak grazing periods.

Capability Groups of Soils

The capability classification is a grouping that shows, in a general way, how suitable soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels—the capability class, the subclass, and the unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be up to four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere 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 country, indicates 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 or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it are subject to little or no erosion but have other limitations that restrict their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, groups of soils 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 identified by numbers assigned locally, for example, IIe-1 or IIIw-2.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamation projects.

The eight classes in the capability system, and the subclasses and units in this county, are described in the list that follows:

Class I. Soils that have few limitations that restrict their use.

- Capability unit I-1.—Well drained and moderately well drained, level soils on bottom lands; surface layer is fine sandy loam, loam, or silt loam; subsoil is fine sandy loam, silt loam, loam, or silty clay loam.

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

- Subclass IIe. Soils subject to moderate erosion if they are not protected.
  - Capability unit IIe-1.—Well-drained, nearly level to gently undulating soils on bottom lands; surface layer is loam, fine sandy loam, or silt loam; subsoil is loam, fine sandy loam, silt loam, or silty clay loam.
  - Capability unit IIe-2.—Moderately well drained, nearly level soils on loessal uplands; surface layer and upper part of subsoil are silt loam; lower part of subsoil is a compact fragipan.
- Subclass IIw. Soils that have moderate limitations because of slightly restricted drainage.
  - Capability unit IIw-1.—Moderately well drained, level soils on bottom lands; surface layer is silty clay loam and subsoil is clayey or silty material.
  - Capability unit IIw-2.—Moderately well drained and somewhat poorly drained, level and nearly level soils on loessal uplands; surface layer and upper part of subsoil are silt loam; lower part of subsoil is a compact fragipan.
  - Capability unit IIw-3.—Poorly drained or somewhat poorly drained, level soils on bottom lands; surface layer is silt loam and subsoil is silty or clayey material.

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

- Subclass IIIe. Soils subject to moderately severe erosion.
  - Capability unit IIIe-1.—Moderately well drained, gently sloping soils on loessal uplands; surface layer is silt loam; a compact fragipan is at a depth of about 2 feet.
- Subclass IIIw. Soils that have severe limitations because of severely restricted drainage.
  - Capability unit IIIw-1.—Poorly drained and somewhat poorly drained, level and nearly level soils on bottom lands; surface layer is silt loam or clay and subsoil is clay.
  - Capability unit IIIw-2.—Poorly drained and somewhat poorly drained, gently undulating soils on bottom lands; surface layer and subsoil are clay.
  - Capability unit IIIw-3.—Poorly drained, level and nearly level soils on loessal uplands; surface layer and upper part of subsoil are silt

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loam; lower part of subsoil is a compact fragipan.

Capability unit IIIw-4.—Somewhat poorly drained, gently undulating soils on bottom lands; surface layer is silt loam and subsoil is loam, silt loam, or silty clay loam.

Capability unit IIIw-5.—Moderately well drained, gently undulating soils on bottom lands; surface layer is silty clay loam; upper part of subsoil is clay and lower part is silt loam.

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

Subclass IVe. Soils subject to severe erosion.

Capability unit IVe-1.—Moderately well drained, moderately sloping soils on loessal uplands; surface layer and upper part of subsoil are silt loam; lower part of subsoil is a compact fragipan.

Class V. Soils that have little or no hazard of erosion but have other limitations, impractical to remove without major reclamation, that limit their use largely to pasture, woodland, or wildlife.

Subclass Vw. Soils subject to frequent overflow.

Capability unit Vw-1.—Poorly drained to excessively drained, level soils on bottom lands; surface layer and subsoil range from coarse sand to clay.

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and that limit their use largely to pasture, woodland, or wildlife. (No class VI soils in Chicot County.)

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation without major reclamation and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIe. Soils very severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability unit VIIe-1.—Severely eroded soils on loessal uplands.

Class VIII. Soils and landforms that, without major reclamation, have limitations that preclude their use for commercial production of plants and restrict their use to recreation, wildlife, water supply, or esthetic purposes. (No class VIII soils in Chicot County.)

Management by Capability Units

The soils in one capability unit have about the same limitations. They are suited to about the same kinds of crops and can produce about the same yields. The soils in one unit, therefore, need about the same kind of management, though they may have developed from different kinds of parent materials and in different ways.

The capability units are described in the following pages. The soils in each unit are listed, characteristics of the soils that affect use and management are discussed, and management suitable for the soils of each unit is suggested.

Capability unit I-1

This unit consists of level, well drained and moderately well drained soils. The surface layer of these soils is brown to dark-brown, friable loam, silt loam, or fine sandy loam. The subsoil is brown, dark-brown, or yellowish-red, friable or firm loam, silt loam, fine sandy loam, or silty clay loam.

The soils in this unit can easily be kept in good tilth and can be cultivated throughout a wide range of moisture content without clodding or crusting. They develop a plowpan or traffic pan, however, if plowed to the same depth with heavy equipment year after year. Plant roots easily penetrate the soil material, except where a plowpan has formed. These soils are neutral to strongly acid. They are medium or high in natural fertility and respond well to fertilizer, particularly to nitrogen. The soils are—

Commerce loam.
Gallion silt loam, 0 to 1 percent slopes.
Gallion and Pulaski fine sandy loams, 0 to 1 percent slopes.
Lonoke silt loam.

These soils make up about 5.2 percent of the county. About 90 percent of the acreage is cultivated, 5 percent is wooded, and 5 percent is pastured.

The soils in this unit are well suited to cotton, corn (fig. 4), soybeans, truck crops, and small grain. They are well suited also to pasture grasses, including bermudagrass, tall fescue, bahiagrass, johnsongrass, and dallisgrass, as well as to legumes such as alfalfa, vetch, Austrian winter peas, annual lespedeza, singletary peas, and white clover. Yields are favorable if the soils are properly managed.

These soils are not subject to erosion, or are subject to only slight erosion, and therefore can be used continuously for those crops that return large amounts of residue to the soil. They need fertilizer and should be tilled

Figure 4.—Corn on Lonoke silt loam in a 55-acre field that yielded 145 bushels of corn per acre. One hundred and forty units of nitrogen were applied to this field, and weeds were controlled by means of chemicals. Rainfall was adequate.

properly. The possible formation of a plowpan must be considered in planning management.

If these soils are used mainly for crops that produce small amounts of residue, they should be planted to soil-improving grasses or legumes every third or fourth year or to a cover crop every year.

Capability unit IIe-1

This unit consists of well-drained, nearly level to gently undulating soils. The surface layer of these soils is brown, friable silt loam, fine sandy loam, or loam. The subsoil is brown and yellowish-brown, friable or firm silt loam, fine sandy loam, loam, or silty clay loam.

The soils in this unit can easily be kept in good tilth and can be cultivated throughout a wide range of moisture content without clodding or crusting. They develop a plowpan or traffic pan, however, if plowed to the same depth with heavy equipment year after year. Plant roots easily penetrate the soil material, except where a plowpan has formed. These soils are alkaline to medium acid. They are moderately fertile or highly fertile and respond well to fertilizer, particularly to nitrogen. The soils are—

Gallion fine sandy loam, 1 to 3 percent slopes.
Gallion silt loam, 1 to 3 percent slopes.
Robinsonville loam, gently undulating.

These soils make up about 1.2 percent of the county. About 50 percent of the acreage is cultivated, 45 percent is pastured, and 5 percent is wooded.

The soils in this unit are well suited to cotton, soybeans, corn, truck crops, and small grain. They are well suited also to pasture grasses, including bermudagrass, bahiagrass, tall fescue, johnsongrass, and dallisgrass, as well as to legumes such as alfalfa, vetch, Austrian winter peas, annual lespedeza, white clover, and singletary peas. Yields are favorable if the soils are properly managed.

Factors to consider in managing these soils are slope, moderate erosion, and the possible formation of a plowpan. If these soils are adequately fertilized, properly tilled, and protected by terraces and contour cultivation, they can be used every year for row crops that return large amounts of residue. Sown crops that return large amounts of residue can be grown continuously without terraces and without contour cultivation.

If the cropping system is one that emphasizes production of low-residue crops, then soil-improving grasses and legumes need to be grown every third or fourth year, or a cover crop needs to follow each low-residue crop.

Capability unit IIe-2

This unit consists of moderately well drained, nearly level soils that have a mottled brittle layer, or fragipan. These soils have a dark-brown, friable, silty surface layer and a yellowish, silty subsoil. The fragipan is in the lower part of the subsoil, at a depth of about 2 feet.

Plant roots easily penetrate these soils down to the fragipan, but this layer greatly restricts further penetration. Water moves slowly through the fragipan, and the subsoil is therefore saturated during rainy seasons, particularly in winter and early in spring. These soils are slightly droughty in a dry summer. They are easy to keep in good tilth, however, and can be cultivated throughout a wide range of moisture content without clodding or crusting. These soils are strongly acid and low in fertility but respond well to lime and fertilizer. They can be irrigated to advantage. The soils are—

Grenada silt loam, 1 to 3 percent slopes.
Grenada silt loam, 1 to 3 percent slopes, eroded.

These soils make up about 1.5 percent of the county. About 60 percent of the acreage is in pasture, 20 percent in cultivation, and 20 percent in woodland.

The factors to be considered in managing these soils are moderate runoff, moderate erosion, wetness in winter, dryness in summer, and low fertility. If well managed, these soils are good producers of cotton, soybeans, corn, and small grain. Annual lespedeza, sericea lespedeza, white clover, crimson clover, singletary peas, vetch, and Austrian winter peas are well-suited legumes. Bermudagrass, bahiagrass, tall fescue, and dallisgrass grow well. Yields of summer crops and pasture vary greatly from one year to another, depending on rainfall.

If they are adequately fertilized, properly tilled, and protected by terraces and contour cultivation, these soils can be used every year for row crops that return large amounts of residue. Sown crops that return large amounts of residue can be grown continuously without terraces and without contour cultivation. Contour cultivation is necessary, however, if row crops are grown in a regular rotation with grasses and legumes.

If the cropping system is one that emphasizes production of low-residue crops, then soil-improving grasses or legumes need to be grown every third or fourth year, or a cover crop needs to follow each low-residue crop.

Pastures on these soils are easily damaged by trampling in winter and early in spring because the fragipan holds water in the upper part of the soils, and thus drying is delayed.

Capability unit IIw-1

This unit consists of moderately well drained, level soils. These soils have a very dark grayish-brown to brown silty clay loam surface layer and a brownish, clayey or silty subsoil.

The soils in this unit are difficult to keep in good tilth and can be cultivated with ease only during the short period when their moisture content is favorable. These soils are slightly acid to alkaline. They are moderately fertile or highly fertile and respond well to nitrogen and, to a limited extent, to potash and phosphate, depending on the crop. The soils are—

Bowdre silty clay loam, 0 to 1 percent slopes.
Commerce silty clay loam.

These soils make up about 2 percent of the county. About 75 percent of the acreage is in cultivation, 15 percent in pasture, and 10 percent in woodland.

Wetness and the texture of the surface layer are factors to consider in planning management for these soils. Under proper management, these soils are good producers of cotton, corn, soybeans, small grain, and grain sorghum. They are well suited to alfalfa, white clover, and common lespedeza. Furthermore, they can be used for bermudagrass, johnsongrass, dallisgrass, and tall fescue.

If they are adequately fertilized, properly tilled, and sufficiently drained, these soils can be used every year for row crops that return large amounts of residue. If they are used primarily for the production of low-residue crops, they should be planted to soil-improving grasses or legumes every third or fourth year or to a cover crop every year.

The best time to plow these soils is in fall or in winter. During this period, wetting and drying plus freezing and thawing help to crumble the seedbed. The depth to which these soils are tilled needs to be varied, and cultivation should be held to the minimum needed to control weeds. Rows should be arranged in a way that allows excess surface water to drain into field ditches that have adequate outlets. Leveling and smoothing the land to improve drainage or for irrigation are feasible in some areas. The use of furrow and border irrigation depends on the slope.

Capability unit IIw–2

This unit consists of somewhat poorly drained and moderately well drained, level and nearly level soils that have a mottled brittle layer, or fragipan. These soils have a brownish, friable, silty surface layer and a yellowish, silty subsoil. The fragipan is in the lower part of the subsoil, at a depth of 15 to 24 inches.

Plant roots easily penetrate these soils down to the fragipan, but this layer greatly restricts further penetration. Water moves slowly through the fragipan, and the subsoil is therefore saturated during rainy seasons, particularly in winter and early in spring. These soils are slightly droughty in a dry summer. They are easy to keep in good tilth, however, and can be cultivated throughout a wide range of moisture content without clodding or crusting. These soils are strongly acid and low in fertility but respond well to fertilization, liming, and irrigation. The soils are—

Calloway silt loam, 0 to 1 percent slopes.
Calloway silt loam, 1 to 3 percent slopes.
Calloway-Grenada silt loams, 0 to 3 percent slopes.
Calloway-Henry silt loams, 0 to 2 percent slopes (Calloway soil only).
Grenada silt loam, 0 to 1 percent slopes.

These soils make up about 4.4 percent of the county. About 65 percent of their acreage is pastured, 25 percent is cultivated, and 10 percent is wooded.

Wetness in winter, dryness in summer, and low fertility are factors to consider in planning management for these soils. If properly managed, these soils are good producers of cotton, soybeans, corn, and small grain. Furthermore, they are well suited to legumes, including annual lespedeza, sericea lespedeza, white clover, crimson clover, vetch, and Austrian winter peas, as well as to pasture grasses such as bermudagrass, bahiagrass, tall fescue, and dallisgrass. Yields of summer crops and pasture grasses vary greatly from one year to another, depending on rainfall.

If they are adequately fertilized, properly tilled, and sufficiently drained, these soils can be used every year for row crops that return large amounts of residue. Rows should be arranged in a way that allows excess surface water to drain into field ditches that have adequate outlets.

If the cropping system is one that emphasizes production of low-residue crops, then soil-improving grasses or legumes need to be grown every third or fourth year, or a cover crop needs to follow each low-residue crop.

Pastures on these soils are wet in winter and early in spring because the fragipan impedes internal drainage, and thus drying is delayed. The pastures consequently are easily damaged by trampling.

Capability unit IIw–3

This unit consists of level, poorly drained or somewhat poorly drained soils. The surface layer of these soils is brown to dark grayish-brown, friable silt loam. The subsoil consists of brownish to reddish, silty or clayey material.

The soils in this unit can easily be kept in good tilth and can be cultivated throughout a wide range of moisture content without clodding or crusting. These soils are slightly acid or medium acid. They are medium in natural fertility but respond well to fertilizer. The soils are—

Dundee silt loam, 0 to 1 percent slopes.
Hebert and Crowley silt loams.
McGehee silt loam, 0 to 1 percent slopes.

These soils make up about 5 percent of the county. About 80 percent of the acreage is cultivated, 15 percent is pastured, and 5 percent is wooded.

Wetness in winter and ease of compaction are limitations that need to be considered in planning management. If well managed, the soils in this unit are well suited to cotton, corn, soybeans, grain sorghum, and small grain. They are well suited also to pasture grasses, including bermudagrass, bahiagrass, dallisgrass, johnsongrass, and tall fescue, as well as to legumes such as annual lespedeza, vetch, and Austrian winter peas. Yields of pasture and hay crops are good with only moderate applications of fertilizer.

If adequately fertilized, properly tilled, and sufficiently drained, these soils can be used continuously for those crops that return large amounts of residue. Crops should be planted in rows arranged so that excess surface water drains into field ditches that have adequate outlets. Furrow irrigation is possible on these soils.

Where emphasis is on the production of low-residue crops, a cover crop needs to follow each low-residue crop, or soil-improving grasses or legumes need to be grown every third or fourth year.

Pastures on these soils are readily damaged by trampling in winter and early in spring because during this period the soils are wet and easily compacted.

Capability unit IIIe–1

This unit consists of moderately well drained, gently sloping soils that have a mottled brittle layer, or fragipan. The surface layer of these soils is brown to dark-brown, friable silt loam. The subsoil consists of brownish, silty material. The fragipan is at a depth of about 2 feet.

Plant roots easily penetrate these soils down to the fragipan, but this layer greatly restricts further penetration. Water moves slowly through the fragipan, and the subsoil is therefore saturated during rainy seasons, particularly in winter and early in spring. These soils are slightly droughty in a dry summer. They are easy to keep in good tilth, however, and can be cultivated throughout a wide range of moisture content without clodding or crusting. These soils are strongly acid and low in fertility but respond well to lime and fertilizer.

They are suited to irrigation. The soils are—

Grenada silt loam, 3 to 8 percent slopes.
Grenada silt loam, 3 to 8 percent slopes, eroded.

These soils make up about 0.8 percent of the county. About 90 percent of their acreage is pastured, 5 percent is cultivated, and 5 percent is wooded.

Rapid runoff, moderate erosion, wetness in winter, dryness in summer, and low fertility are factors to consider in planning management for these soils. If properly managed, these soils are good producers of cotton, soybeans, corn, and small grain. They are well suited to legumes, including annual lespedeza, sericea lespedeza, white clover, crimson clover, singletary peas, vetch, and Austrian winter peas, as well as to pasture grasses such as bermudagrass, bahiagrass, tall fescue, and dallisgrass. Yields of summer crops and pasture grasses vary greatly from one year to another, depending on rainfall.

The hazard of erosion is proportionate to the grade and length of the slope. Consequently, the soils in this unit can be used safely for cultivated crops only if conservation treatment is intensified progressively as the hazard of erosion increases.

Terraces, contour farming, adequate fertilization, and proper tillage permit the continuous use of the gentler slopes, which make up more than 90 percent of this unit, for clean-tilled crops that return large amounts of residue. Low-residue crops, however, should occupy the soils only one-third to one-half of the time, and the soils need to be farmed on the contour or on a cross slope in the absence of terraces.

On the small acreage of short slopes, which make up the steeper part of this unit, more intensive or special treatment is needed to prevent severe damage from erosion. Grasses or legumes, or both, should occupy the soils one-half to three-fourths of the time, depending on the intensity of the treatment. Special treatment may include terraces, contour farming, adequate fertilization, proper tillage, and crop-residue management.

Capability unit IIIw-1

This unit consists of poorly drained and somewhat poorly drained, level and nearly level soils. The surface layer of these soils is gray silt loam or clay. The subsoil is gray to dark reddish-brown clay.

The soils in this unit are not easily penetrated by plant roots. Furthermore, these soils crack when dry, and thus the roots are damaged. If the soil material is wet for prolonged periods, aeration is poor and roots are damaged because of a lack of oxygen and nitrogen. These soils are saturated during the rainy seasons, particularly in winter and early in spring. They are difficult to maintain in good tilth because of their texture and because, most of the time, they are either too wet or too dry. These soils are low in nitrogen, medium in potassium, and high in phosphorus. They respond well to nitrogen fertilizer, especially where planted to cotton or grasses. Legumes on these soils do not need nitrogen, except for a small amount as a starter fertilizer. The soils in this unit are—

Perry clay, 0 to 1 percent slopes.
Perry silt loam, overwash.
Portland clay, 0 to 1 percent slopes.
Sharkey clay, 1 to 3 percent slopes.

These soils make up about 53.1 percent of the county. About 75 percent of the acreage is cultivated, 8 percent is pastured, and 17 percent is wooded.

Cotton, rice, soybeans, grain sorghum, and small grain grow well if these soils are properly managed. Bermudagrass, tall fescue, dallisgrass, white clover, and singletary peas also grow well.

If properly tilled and adequately drained and fertilized, the soils in this unit can be used continuously for crops that return large amounts of residue. If used primarily for low-residue crops, these soils should be planted to soil-improving grasses or legumes every second or third year or to a cover crop every year.

The best time to plow these soils is in fall or early in winter. During this period, wetting and drying plus freezing and thawing help to crumble the clods in the seedbed. The depth to which these soils are tilled should be varied, and cultivation should be held to a minimum to control weeds. Rows need to be arranged so that excess surface water drains into field ditches that have adequate outlets. Leveling and smoothing the land to improve drainage or for irrigation are feasible in some areas. The use of furrow and border irrigation depends on the slope.

Capability unit IIIw-2

This unit consists of poorly drained and somewhat poorly drained, gently undulating, clayey soils. These soils have a gray surface layer and a gray to dark reddish-brown subsoil.

The soils in this unit are not easily penetrated by plant roots. Furthermore, these soils crack when dry, and thus the roots are damaged. If the soil material is wet for prolonged periods, aeration is poor and plants (except rice) are damaged because of a lack of oxygen and nitrogen. These soils are saturated during the rainy seasons, particularly in winter and early in spring. They are difficult to maintain in good tilth because of their texture and because, most of the time, they are either too wet or too dry. These soils are low in nitrogen, except in undisturbed areas, medium in potassium, and high in phosphorus. They respond well to nitrogen, especially where planted to cotton or grass. Legumes on these soils do not need nitrogen, except for a small amount as a starter fertilizer. The soils in this unit are—

Perry clay, gently undulating.
Portland clay, gently undulating.
Sharkey clay, gently undulating.

These soils make up 4.9 percent of the county. About 50 percent of their acreage is cultivated, 20 percent is pastured, and 30 percent is wooded. Wooded areas are being cleared at a rapid pace and then planted to soybeans.

These soils are well suited to rice, soybeans, bermudagrass, tall fescue, and dallisgrass. They can be used for cotton, grain sorghum, small grain, white clover, vetch, singletary peas, and alfalfa (fig. 5).

Characteristics that must be considered in planning management for these soils are poor drainage, very slow permeability, fine texture, and undulating relief. These characteristics cause tillage, irrigation, and drainage problems.

If properly tilled and adequately drained and fertilized, the soils in this unit can be used continuously for

Figure 5.—Five-year-old alfalfa on Sharkey clay. Alfalfa yields on this soil average 125 bales per acre every 5 years. A system for total drainage was installed in this field.

crops that return large amounts of residue. If used primarily for low-residue crops, these soils should be planted to soil-improving grasses or legumes every second or third year or to a cover crop every year.

The best time to plow these soils is in fall or early in winter. During this time, the soil material is neither too wet nor too dry, and the wetting and drying plus freezing and thawing help to crumble the seedbed (fig. 6). The depth to which these soils are tilled needs to be varied, and cultivation should be held to the minimum needed to control weeds. Rows need to be arranged so that excess water drains into field ditches that have adequate outlets.

Either border or row irrigation is feasible on these soils, but it is important that the irrigation system be properly designed and constructed. The system should provide for the removal of excess water. Leveling the land helps to improve drainage and irrigation.

Capability unit IIIw–3

This unit consists of poorly drained, level and nearly level soils that have a mottled brittle layer, or fragipan.

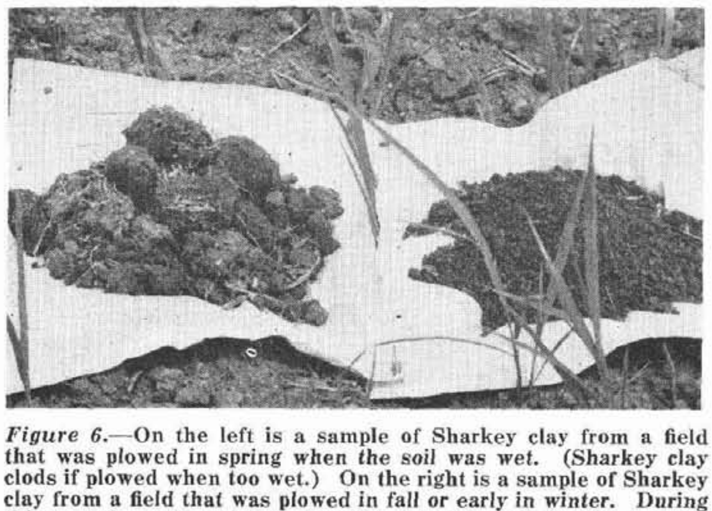

Figure 6.—On the left is a sample of Sharkey clay from a field that was plowed in spring when the soil was wet. (Sharkey clay clods if plowed when too wet.) On the right is a sample of Sharkey clay from a field that was plowed in fall or early in winter. During this period, wetting and drying plus freezing and thawing help to crumble the seedbed and give granular structure to the soil material.

These soils have a grayish, friable, silty surface layer and a grayish, silty subsoil. The fragipan is in the lower part of the subsoil, at a depth of about 18 inches.

Plant roots easily penetrate these soils down to the fragipan, but this layer greatly restricts further penetration. Water moves slowly through the fragipan, and the subsoil is therefore saturated during rainy seasons, particularly in winter and early in spring. These soils are droughty in a dry summer. They are easy to keep in good tilth and can be cultivated throughout a wide range of moisture content without clodding or crusting. They are strongly acid and are low in fertility but respond well to lime and fertilizer. The soils are—

Calloway-Henry silt loams, 0 to 2 percent slopes (Henry soil only).
Henry silt loam.

These soils make up 4.2 percent of the county. About 50 percent of the acreage is pastured, 30 percent is wooded, and 20 percent is cultivated.

These are fairly good soils for soybeans, and they can be used for cotton, grain sorghum, and small grain as well as for grasses and legumes, including dallisgrass, bermudagrass, tall fescue, white clover, vetch, and singletary peas. Yields of summer annual crops such as cotton and grain sorghum vary greatly from year to year, depending on rainfall.

Wetness in winter, dryness in summer, and low fertility are factors to consider in planning management for these soils. If properly tilled and adequately fertilized and drained, these soils can be used every year for row crops that return large amounts of residue. Rows should be arranged in a way that allows excess water to drain into field ditches that have adequate outlets.

Where emphasis is on the production of low-residue crops, a cover crop needs to follow each low-residue crop, or soil-improving grasses or legumes need to be grown every second or third year.

These soils can be irrigated, but the irrigation system must be properly designed and constructed and must provide for the removal of excess water, including rainfall.

In winter and early in spring, pastures are wet and are easily damaged by trampling.

Capability unit IIIw–4

This unit consists of somewhat poorly drained, gently undulating soils. The surface layer of these soils is brown to dark grayish-brown, friable silt loam. The subsoil is brownish to reddish loam, silt loam, or silty clay loam.

These soils are easy to keep in good tilth and can be cultivated throughout a wide range of moisture content without clodding or crusting. They are moderately fertile but respond well to fertilizer. They are slightly acid to strongly acid. The soils are—

Dundee silt loam, gently undulating.
McGehee silt loam, gently undulating.

These soils make up about 0.3 percent of the county. About 70 percent of their acreage is cultivated, 20 percent is pastured, and 10 percent is wooded.

Cotton, corn, soybeans, grain sorghum, and small grain grow well on these soils. Bermudagrass, dalligrass, johnsongrass, and tall fescue also grow well, as do legumes such as annual lespedeza, vetch, and Austrian winter peas.

Wetness in winter, ease of compaction, and gently undulating relief are factors to consider in planning management for these soils. If properly tilled and adequately fertilized and drained, these soils can be used every year for crops that return large amounts of residue. Rows should be arranged so that excess water drains into field ditches that have adequate outlets.

Where emphasis is on the production of low-residue row or sown crops, a cover crop needs to follow each low-residue crop, or soil-improving grasses or legumes need to be grown every second or third year.

Land leveling is feasible in some areas and is necessary if either row or border irrigation is to be used. Proper design and construction of the irrigation system is important.

Capability unit IIIw-5

Bowdre silty clay loam, gently undulating, is the only soil in this unit. It is a moderately well drained soil. The surface layer is very dark grayish-brown silty clay loam. The upper part of the subsoil is very dark grayish-brown clay, and the lower part is brown silt loam. Below the subsoil is loamy sand.

The soil in this unit is difficult to keep in good tilth and can be cultivated with ease only during the short period when its moisture content is favorable. This soil is slightly acid to alkaline. It is moderately fertile but responds well to nitrogen and, to a limited extent, to potash and phosphate, depending on the crop.

This soil makes up about 1.2 percent of the county. It is 60 percent cultivated, 30 percent pasture, and 10 percent wooded.

Wetness, the texture of the surface layer, and the gently undulating relief are factors to consider in planning management. If properly managed, this soil is a good producer of cotton, corn, soybeans, small grain, and grain sorghum. It is well suited to alfalfa, white clover, and lespedeza and, furthermore, can be used for bermudagrass, dallisgrass, and tall fescue.

If properly tilled and adequately drained and fertilized, this soil can be used every year for crops that return large amounts of residue. If used primarily for low-residue crops, it should be planted to soil-improving grasses or legumes every third or fourth year or to a cover crop every year.

The best time to plow this soil is in fall or in winter. During this period, wetting and drying plus freezing and thawing help to crumble the seedbed. The depth to which this soil is tilled needs to be varied, and cultivation should be held to the minimum needed to control weeds. Rows should be arranged in a way that allows excess surface water to drain into field ditches that have adequate outlets.

Capability unit IVe-1

Grenada silt loam, 8 to 12 percent slopes, eroded, is the only soil in this unit. It is a moderately well drained soil that has a mottled, brittle fragipan. The surface layer of this soil is dark-brown to brown, friable silt loam, and the subsoil is brownish silt loam. The fragipan is in the lower part of the subsoil, at a depth of about 2 feet.

Plant roots easily penetrate the soil material down to the fragipan, but this layer greatly restricts further penetration. Water moves slowly through the fragipan, and the subsoil is therefore saturated during rainy seasons, particularly in winter and early in spring. This soil is slightly droughty in a dry summer. It is easy to keep in good tilth, however, and can be cultivated throughout a wide range of moisture content without clodding or crusting. This soil is strongly acid and low in fertility but responds well to lime and fertilizer. It is suited to irrigation.

This soil makes up about 0.1 percent of the county. It is 90 percent pastured, 5 percent cultivated, and 5 percent wooded.

Because it is subject to severe erosion, this soil cannot be used intensively for cultivated crops. Wetness in winter, dryness in summer, and low fertility impose additional restrictions. If carefully managed, this soil is a fair producer of sown grain sorghum and small grain, and it can be used for soybeans and cotton. Sericea lespedeza, annual lespedeza, white clover, crimson clover, and vetch are well-suited legumes, and bahiagrass, bermudagrass, dallisgrass, and tall fescue are the best suited grasses.

Permanent pasture or wood production are the best uses for this soil. Nevertheless, if contour stripcropping is used, row crops can be grown 1 year out of 4 years in a rotation with grasses or legumes. If contour cultivation is used, sown crops can be part of a cropping system that includes soil-improving grasses or legumes 60 to 75 percent of the time.

Capability unit Vw-1

This unit consists of level, poorly drained to excessively drained soils along the Mississippi River. These soils are not protected by the levee and thus are frequently flooded. They are subjected to change with each overflow. Changes are brought about by the scouring action of the floodwaters or the deposition of sand. Generally, these soils are clayey to silty or sandy. They are grayish in color. The soils are—

Mixed alluvial land.
Waverly silt loam.

These soils make up about 10.7 percent of the county. About 90 percent of their acreage is wooded, and 10 percent is pastured.

Waverly silt loam is low in natural fertility, and Mixed alluvial land ranges from low, where it is coarse textured, to high, where it is fine textured.

Frequent overflow is the major limitation and is to be considered in planning use and management. The overflows preclude the use of these soils for cultivated crops. Thus pasture and woods are the best uses. Suitable pasture plants are bermudagrass, johnsongrass, tall fescue, dallisgrass, and white clover.

Capability unit VIIe-1

Gullied land, a miscellaneous land type, makes up this unit. The soil material is loessal in origin. It is somewhat poorly drained or moderately well drained. Areas of this land type are severely eroded. In some places, erosion has cut down to the brownish silty clay loam in the lower part of the subsoil, and in other places to the fragipan. The fragipan in uneroded areas is at a depth of about 2 feet.

Gullied land makes up about 0.1 percent of the county. It is 80 percent pastured and 20 percent wooded.

In addition to the severe erosion hazard, runoff is a problem because of the slope, which in places is as much as 20 percent. Wetness in winter, dryness in summer, and low fertility impose further restrictions.

Most areas can be used, to a limited extent, for pasture but are not suitable for cultivation. Bermudagrass and bahiagrass will grow in the smoothed areas, and kudzu is a good plant for most of the remaining areas.

Estimated Yields

Table 2 shows, for each soil in the county, estimated average yields per acre of the principal field and pasture crops. The yields are those that can be expected over a period of years. They were estimated on the basis of consultations with farmers and with those who advise or work with farmers.

In the A columns are yields to be expected under common or customary management. Under such management, crops are not rotated according to a definite plan, the amount and kind of commercial fertilizer needed is not determined by soil tests, and little is done to prevent erosion or to provide adequate drainage.

In the B columns are yields to be expected under improved management. Improved management includes the following practices: Returning crop residue to the soil; fertilizing in amounts determined by chemical analysis and on the basis of past experience; choosing well-suited, high-yielding varieties for planting; preparing a proper seedbed; planting or seeding at recommended rates and at proper times; inoculating legumes when necessary; cultivating row crops to a shallow depth; controlling weeds, insects, and diseases; providing adequate surface drainage in flat areas; terracing and cultivating on the contour in sloping areas; and controlling grazing.

TABLE 2.—*Estimated average acre yields of principal crops*

[Yields in columns A are to be expected, over a period of years, under common management, and those in columns B under improved management. Absence of figure indicates crop is not suitable or not commonly grown on the soil]

Soil	Capability unit	Rice		Cotton (lint)		Soybeans		Oats		Pasture					
										Common bermudagrass		Coastal bermudagrass		Fescue [1]	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B
		Bushels	*Bushels*	*Pounds*	*Pounds*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Animal-unit-month* [2]	*Animal-unit-month* [2]	*Animal-unit-month* [2]	*Animal-unit-month* [2]	*Animal-unit-month* [2]	*Animal-unit-month* [1]
Bowdre silty clay loam, 0 to 1 percent slopes	IIw–1	-----	-----	450	650	24	32	35	55	6	8	6	10	5	9
Bowdre silty clay loam, gently undulating	IIIw–5	-----	-----	440	570	22	27	35	54	6	8	6	10	5	9
Calloway silt loam, 0 to 1 percent slopes	IIw–2	-----	-----	425	575	20	25	35	55	5	7	6	10	5	8
Calloway silt loam, 1 to 3 percent slopes	IIw–2	-----	-----	415	550	20	25	32	55	5	7	6	10	5	8
Calloway-Grenada silt loams, 0 to 3 percent slopes [3]	IIw–2	-----	-----	400	550	20	25	35	55	5	7	6	10	5	8
Calloway-Henry silt loams, 0 to 2 percent slopes [4]	IIw–2, IIIw–3.	-----	-----	325	425	18	23	30	55	5	7	6	10	5	8
Commerce loam	I–1	-----	-----	600	850	26	35	35	70	6	9	7	12	5	9
Commerce silty clay loam	IIw–1	-----	-----	470	700	25	35	35	60	6	9	7	12	5	9
Crowley silt loam	IIw–3	75	92	450	600	22	30	40	55	5	7	7	10	5	8
Dundee silt loam, 0 to 1 percent slopes	IIw–3	-----	-----	500	750	27	32	35	60	6	9	7	11	5	9
Dundee silt loam, gently undulating	IIIw–4	-----	-----	490	660	26	31	35	58	5	8	6	10	5	8
Gallion and Pulaski fine sandy loams, 0 to 1 percent slopes [5]	I–1	-----	-----	550	750	27	32	40	60	6	9	7	11	5	8
Gallion fine sandy loam, 1 to 3 percent slopes	IIe–1	-----	-----	525	725	25	30	40	60	6	9	7	11	5	8
Gallion silt loam, 0 to 1 percent slopes	I–1	-----	-----	575	775	26	32	40	60	6	9	7	11	5	9
Gallion silt loam, 1 to 3 percent slopes	IIe–1	-----	-----	525	750	25	30	35	55	6	9	7	11	5	9
Grenada silt loam, 0 to 1 percent slopes	IIw–2	-----	-----	400	625	25	30	35	55	5	7	6	11	4	8
Grenada silt loam, 1 to 3 percent slopes	IIe–2	-----	-----	385	600	22	30	35	55	5	7	6	10	4	8
Grenada silt loam, 1 to 3 percent slopes, eroded	IIe–2	-----	-----	350	585	20	29	25	50	4.5	6.5	7	10	4	7.5

See footnotes at end of table.

TABLE 2.—*Estimated average acre yields of principal crops*—Continued

Soil	Capability unit	Rice A	Rice B	Cotton (lint) A	Cotton (lint) B	Soybeans A	Soybeans B	Oats A	Oats B	Pasture: Common bermudagrass A	Common bermudagrass B	Coastal bermudagrass A	Coastal bermudagrass B	Fescue [1] A	Fescue [1] B
		Bushels	*Bushels*	*Pounds*	*Pounds*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Animal-unit-month* [2]	*Animal-unit-month* [2]	*Animal-unit-month* [2]	*Animal-unit-month* [2]	*Animal-unit-month* [2]	*Animal-unit-month* [2]
Grenada silt loam, 3 to 8 percent slopes	IIIe-1	----	----	325	550	18	23	30	50	4	6	6	10	4	7.5
Grenada silt loam, 3 to 8 percent slopes, eroded	IIIe-1	----	----	300	540	15	20	25	45	3	5	5	9	3	7
Grenada silt loam, 8 to 12 percent slopes, eroded	IVe-1	----	----	----	----	----	----	----	----	3	4.5	4	7	----	----
Gullied land	VIIe-1	----	----	----	----	----	----	----	----		1 3	2	4	----	----
Hebert and Crowley silt loams [6]	IIw-3	70	85	500	700	26	32	40	55	6	9	7	10	5	8
Hebert silt loam	IIw-3	70	85	550	750	28	34	40	55	6	9	7	10	5	8
Henry silt loam	IIIw-3	----	----	300	400	18	22	30	55	3	6	6	9	4	7
Lonoke silt loam	I-1	----	----	600	800	26	35	45	60	6	9	7	11	5	8
McGehee silt loam, 0 to 1 percent slopes	IIw-3	75	85	425	575	25	30	40	55	6	9	7	10	5	8
McGehee silt loam, gently undulating	IIIw-4	----	----	400	500	20	25	35	50	6	9	7	10	5	8
Mixed alluvial land	Vw-1	----	----	----	----	----	----	----	----	4	6	4	7	3	5
Perry clay, 0 to 1 percent slopes	IIIw-1	85	95	350	500	22	35	30	50	4	7	5	9	5	9
Perry clay, gently undulating	IIIw-2	75	85	340	475	22	30	30	50	4	7	5	9	5	9
Perry silt loam, overwash	IIIw-1	70	90	375	525	25	33	30	50	4	7	5	9	5	9
Portland clay, 0 to 1 percent slopes	IIIw-1	85	95	400	550	22	35	30	50	4	7	5	9	5	9
Portland clay, gently undulating	IIIw-2	75	85	375	525	22	30	30	50	4	7	5	9	5	9
Pulaski fine sandy loam	I-1	----	----	600	800	26	35	45	60	6	9	7	11	5	8
Robinsonville loam, gently undulating	IIe-1	----	----	550	725	26	35	40	60	6	8	6	10	5	8
Sharkey clay, 1 to 3 percent slopes	IIIw-1	85	95	350	500	22	35	25	50	4	7	5	9	5	9
Sharkey clay, gently undulating	IIIw-2	75	85	340	475	22	30	25	50	4	7	5	9	5	9
Waverly silt loam	Vw-1	----	----	----	----	----	----	----	----	4	6	4	7	3	5

[1] Fescue dies in a few years if management is not good.

[2] An animal-unit-month represents a month of grazing for one animal unit (one cow, steer, or horse; five hogs; or seven sheep or goats) without injury to the pasture.

[3] Also refer to yields shown for Calloway silt loams and for Grenada silt loams. Yields of this complex vary because the proportion of each soil in the complex varies.

[4] Also refer to yields shown for Calloway silt loams and for Henry silt loam. Yields of this complex vary because the proportion of each soil in the complex varies.

[5] Also refer to yields shown for Gallion fine sandy loam and for Pulaski fine sandy loam. Yields of this unit vary because the proportion of each soil in the unit varies.

[6] Also refer to yields shown for Hebert silt loam and for Crowley silt loam. Yields of this unit vary because the proportion of each soil in the unit varies.

Use of the Soils for Fish and Wildlife [2]

Chicot County in general supports many kinds of fish and many kinds of game and nongame birds and mammals. The populations vary according to the use man has made of the soils, and according to the inherent or induced fertility of those soils. Fish are abundant in streams and lakes (fig. 7) and in reservoirs constructed on productive soils, particularly the heavy clays (fig. 8). Ducks winter in flooded areas in the county. The Sharkey, Perry, and Portland soils (all heavy clays) are easily flooded for ducks. Deer and turkey are found in the extensive wooded areas that are directly west of the levee along the Mississippi River, south of Lake Chicot, in the southwestern part of the county, and west of McMillan Corner. Bobwhite, mourning dove, rabbit, squirrel, and many nongame birds are common throughout the county.

On the uplands, habitats for game and nongame birds and for game mammals are plentiful in areas directly west of the levee along the Mississippi River and, because of the patch-farming system, in the Macon Ridge section.

[2] ROY A. GRIZZELL, JR., biologist, Soil Conservation Service, assisted in the preparation of this section.

Figure 7.—Crappie, bass, bream, and blue channel catfish abound in Lake Chicot, the largest natural lake in Arkansas.

On the lowlands (Mississippi River delta), habitats generally are scarce, except in those areas that are still wooded.

Food generally is plentiful on the productive soils. After rice, soybeans, and small grain have been harvested, a plentiful amount of waste grain remains. Wooded areas provide browse for deer, bobwhite, squirrel, and wild turkey.

Water for fish and wildlife is abundant. Rainfall is adequate, the underground supply is good, and runoff is received from several watershed systems. High water at times drives wildlife from the lower areas.

The Soil Conservation Service maintains up-to-date information on each important kind of fish and wildlife and on each significant wildlife food or cover plant in Chicot County; and it has specifications for the establishment and maintenance of each soil and water conservation practice that improves wildlife management.

Wildlife Suitability Groups

Most kinds of fish and wildlife cannot be related directly to soils. Instead, the preferred foods of each kind of wildlife are related to a group of soils that have similar characteristics and, hence, similar capacity to sustain fish and wildlife by providing food, water, and cover.

Figure 8.—A freshly dug reservoir on Sharkey clay. Such reservoirs are used in a fish-rice rotation.

The soils in Chicot County have been placed in seven wildlife groups. These groups are discussed in the pages that follow.

Table 3 lists alphabetically the most important wildlife food plants in the county and rates them as *choice*, *fair*, or *unimportant* as food for given kinds of wildlife. The plants listed in this table also furnish cover for some species.

Table 4 lists the same plants and rates them as *suited*, *marginally suited*, *poorly suited*, or *not suited* to the soils in each of the seven wildlife groups.

Wildlife suitability group 1

This group consists mostly of poorly drained clayey soils. These soils have a medium to high available moisture capacity and are medium to high in natural fertility. They are difficult to till but produce good yields of rice, soybeans, and other crops. They make up about 58 percent of the county, and about half of their acreage is cultivated or pastured. The soils are—

Perry clay, 0 to 1 percent slopes.
Perry clay, gently undulating.
Perry silt loam, overwash.
Portland clay, 0 to 1 percent slopes.
Portland clay, gently undulating.
Sharkey clay, 1 to 3 percent slopes.
Sharkey clay, gently undulating.

These soils are suited to many of the plants that are choice foods for several kinds of wildlife, including deer, squirrel, and wild turkey. Some of the plants are signalgrass, partridgepea, common ragweed, smartweed, and greenbrier. Oak and pecan trees also grow on these soils.

Because they are slowly permeable, these soils, especially those in level areas, are excellent sites for reservoirs that can be stocked with fish and used by ducks.

Wildlife suitability group 2

The soils in this group are well drained to somewhat poorly drained and have a high or very high available moisture capacity. Their surface layer is 6 to 8 inches thick, and their subsoil consists of silt loam or silty clay loam. These soils are easy to work. They make up about 8 percent of the county, and most of their acreage is cultivated or pastured. The soils are—

Bowdre silty clay loam, 0 to 1 percent slopes.
Bowdre silty clay loam, gently undulating.
Commerce loam.
Commerce silty clay loam.
Dundee silt loam, 0 to 1 percent slopes.
Dundee silt loam, gently undulating.
Robinsonville loam, gently undulating.

These soils are suited to many plants that are choice foods for several kinds of wildlife, including mourning dove, squirrel, and deer. Some of the plants are annual lespedeza, partridgepea, tickclover, common ragweed, and woolly croton. Oak, mulberry, black cherry, and pecan trees also provide food.

Wildlife suitability group 3

This group consists of well-drained soils that formed in sediment washed from the Arkansas River. The surface layer of these soils is 5 to 7 inches thick; the subsoil is silt loam or silty clay loam. The available

TABLE 3.—*Suitability of plants as food for wildlife*

[The figure *1* indicates that the plant is *choice* (attractive and nutritious for a given kind of wildlife); the figure *2*, *fair* (eaten when choice foods are not available); the figure *3*, *unimportant* (eaten only in small amounts)]

Plant	Part of plant eaten	Bob-white	Deer	Dove	Duck	Rabbit	Squirrel	Turkey	Nongame birds		
									Fruit eaters	Seed eaters	Nut eaters
Barnyard grass	Seed	1	3	1	1	3	3	2	3	1	3
Blackberry and dewberry	Foliage	3	2	3	3	3	2	3	3	3	3
	Fruit	1	3	3	3	3	3	1	1	3	3
Blackgum	Fruit	2	3	3	3	3	1	2	1	3	2
Browntop millet	Seed	1	3	1	1	3	3	1	3	1	3
Cherry, black	Fruit	1	3	3	3	3	1	2	1	3	2
Clover, white	Foliage	2	1	3	3	1	3	1	3	3	3
Corn	Seed	1	1	1	1	1	1	1	3	1	3
Cowpeas	Seed	1	1	2	3	2	3	1	3	3	3
Croton (doveweed or goatweed)	Seed	1	3	1	3	3	3	3	3	1	3
Elm	Seed	3	3	3	3	3	1	3	3	3	3
Fescue, tall	Foliage	3	2	3	3	2	3	2	3	3	3
Grapes, wild	Fruit	3	3	3	3	3	2	1	1	3	3
Greenbrier	Foliage	3	1	3	3	1	3	3	3	3	3
Hackberry	Fruit	2	3	3	3	3	2	1	1	3	3
Hickory	Nut	3	3	3	3	3	1	2	3	3	1
Honeysuckle	Foliage	3	1	3	3	2	3	3	3	3	3
Japanese millet	Seed	2	3	1	1	3	3	2	3	1	3
Lespedeza, annual	Foliage	3	1	3	3	2	3	3	3	3	3
	Seed	1	3	2	2	3	3	2	3	3	3
Lespedeza, bush	Foliage	3	1	3	3	2	3	3	3	3	3
	Seed	1	3	3	3	3	3	3	3	3	3
Mulberry	Fruit	1	2	3	3	3	1	1	1	3	3
Oak	Acorns	1	1	3	1	3	1	1	3	3	3
Oats	Foliage	3	1	3	3	1	3	1	3	3	3
Partridgepea	Seed	1	3	3	3	3	3	3	3	3	3
Pecan	Nut	1	2	3	3	3	1	1	3	3	1
Pine	Seed	1	3	1	3	3	1	1	3	1	1
Pokeweed	Fruit	3	3	1	3	3	3	2	1	1	3
Ragweed, common	Seed	1	3	1	3	3	3	3	3	1	3
Rice	Seed	1	3	2	1	3	3	3	3	1	3
Ryegrass	Foliage	3	1	3	3	1	3	1	3	3	3
Smartweed	Seed	2	3	3	1	3	3	3	3	3	3
Sorghum, grain [1]	Seed	1	1	1	1	1	1	1	3	1	3
Soybeans	Foliage	3	1	3	3	1	3	3	3	3	3
	Seed	3	3	2	1	3	3	3	3	2	3
Sunflower, common	Seed	1	3	1	3	3	1	1	3	1	1
Sweetgum	Seed	1	3	1	3	3	2	2	3	1	3
Tickclover	Seed	1	3	3	3	3	3	2	3	3	3
Wheat	Seed	1	3	1	3	3	3	1	3	1	3
	Foliage	3	1	3	3	1	3	1	3	3	3

[1] Grain sorghum is a choice food of most wildlife that feed on grain. It is limited in value and suitability because the humid climate causes it to rot and because it attracts blackbirds, sparrows, and other undesirable birds.

moisture capacity is high or very high. These soils are easy to work. They make up about 2 percent of the county, and about 90 percent of their acreage is cultivated or pastured. The soils are—

Gallion silt loam, 0 to 1 percent slopes.
Gallion and Pulaski fine sandy loams, 0 to 1 percent slopes.
Lonoke silt loam.

These soils are suited to annual lespedeza, partridgepea, tickclover, common ragweed, and woolly croton. Also, they are good for oak, mulberry, black cherry, and pecan. Thus, choice foods are plentiful on these soils, especially for mourning dove and squirrel.

Wildlife suitability group 4

This group consists of well-drained and somewhat poorly drained soils that formed in sediment deposited by the Arkansas River. The surface layer of these soils is 5 to 7 inches thick; the subsoil is silt loam or silty clay loam. The available moisture capacity is high or very high. These soils are easy to work. They make up about 5 percent of the county, and about 90 percent of their acreage is cultivated or pastured. The soils are—

Gallion fine sandy loam, 1 to 3 percent slopes.
Gallion silt loam, 1 to 3 percent slopes.
Hebert and Crowley silt loams.
McGehee silt loam, 0 to 1 percent slopes.
McGehee silt loam, gently undulating.

These soils are suited to oak and pecan trees, smartweed, common ragweed, signalgrass, and tickclover—plants that are choice foods for several kinds of wildlife, including bobwhite, deer, mourning dove, and squirrel.

TABLE 4.—*Suitability of plants to soils, by wildlife suitability groups*

[The figure *1* indicates that the plant is *suited* to the soils in the given soil groups; the figure *2*, *marginally suited;* the figure *3*, *poorly suited* or *not suited*]

Plants	Wildlife suitability group						
	1	2	3	4	5	6	7
Barnyard grass	1	1	1	1	3	3	1
Blackberry and dewberry	1	1	1	1	1	1	1
Blackgum	1	2	2	2	1	1	2
Browntop millet	1	1	1	1	1	2	1
Cherry, black	3	3	3	3	1	1	3
Clover, white	1	1	1	1	1	3	3
Corn	1	1	1	1	2	3	3
Cowpeas	2	1	1	1	1	3	3
Croton	1	1	1	1	1	3	3
Elm	1	1	1	1	1	1	1
Fescue, tall	1	1	1	1	1	3	3
Grapes, wild	1	1	1	1	1	3	1
Greenbrier	1	1	1	1	1	1	1
Hackberry	1	1	1	1	3	3	1
Hickory	1	1	1	1	1	3	1
Honeysuckle	3	3	3	3	1	1	3
Japanese millet	1	1	1	1	3	3	1
Lespedeza, bush	3	3	3	3	1	1	3
Lespedeza, annual	1	1	1	1	1	1	3
Mulberry	1	1	1	1	1	1	1
Oak, upland [1]	3	3	3	3	1	1	3
Oak, lowland [2]	1	1	1	1	2	2	1
Oats	1	1	1	1	1	3	3
Partridgepea	1	1	1	1	1	1	1
Pecan	1	1	1	1	3	3	1
Pine	3	3	3	3	1	1	3
Pokeweed	1	1	1	1	1	1	1
Ragweed, common	1	1	1	1	1	1	1
Rice	1	1	1	1	3	3	3
Ryegrass	1	1	1	1	1	1	3
Signalgrass	1	2	2	1	1	2	3
Smartweed	1	1	1	1	3	3	1
Soybeans	1	1	1	1	1	3	3
Sorghum, grain	1	1	1	1	1	3	3
Sunflower, common	1	1	1	1	1	1	1
Sweetgum	2	1	1	1	2	2	3
Tickclover	1	1	1	1	1	1	1
Wheat	1	1	1	1	1	1	3

[1] White oak, post oak, northern red oak, black oak, and Nuttall oak.

[2] Overcup oak, swamp chestnut oak, cherrybark oak, pin oak, Shumard oak, water oak, and willow oak.

Wildlife suitability group 5

This group consists of soils that developed in loessal material on Macon Ridge. These soils have a surface layer of silt loam and a subsoil of silt loam or silty clay loam. They are easy to work and have a very high available moisture capacity. They make up about 12 percent of the county, and about half their acreage is cultivated or pastured. The soils in this group are—

Calloway silt loam, 0 to 1 percent slopes.
Calloway silt loam, 1 to 3 percent slopes.
Calloway-Grenada silt loams, 0 to 3 percent slopes.
Calloway-Henry silt loams, 0 to 2 percent slopes.
Grenada silt loam, 0 to 1 percent slopes.
Grenada silt loam, 1 to 3 percent slopes.
Grenada silt loam, 1 to 3 percent slopes, eroded.
Grenada silt loam, 3 to 8 percent slopes.
Grenada silt loam, 3 to 8 percent slopes, eroded.
Henry silt loam.
Waverly silt loam.

These soils are suited to annual lespedeza, tickclover, woolly croton, signalgrass, and oak trees. Wildlife attracted by these plants includes mourning dove, bobwhite, squirrel, deer, and rabbit.

Wildlife suitability group 6

This group consists chiefly of moderately well drained soils that formed in loessal material. These soils have a surface layer of silt loam or silty clay loam and a subsoil of silt loam or silty clay loam. Their available moisture capacity is very high. Erosion is severe in some places. These soils make up less than 1 percent of the county. Their acreage is either in pasture or has reverted to woods. The soils are—

Grenada silt loam, 8 to 12 percent slopes, eroded.
Gullied land.

Because of their position and slope, these soils cannot be flooded for use as duck fields. The pecan, oak, and hackberry trees and the tickclover, ragweed, and greenbrier on these soils attract mourning dove, bobwhite, squirrel, deer, and rabbit.

Wildlife suitability group 7

Mixed alluvial land makes up this group. It consists of excessively drained to poorly drained Mississippi River alluvium and occurs between the Mississippi River and the levee along the river. The areas are unprotected and thus are frequently flooded. They make up about 9 percent of the county. About 90 percent of the acreage is wooded. The areas produce many of the choice foods of deer, mourning dove, wild turkey, squirrel, and other species. Some of the plants that grow in these areas are tickclover, ragweed, and greenbrier. Typical of the trees that grow there are oak, pecan, and hackberry.

Use of the Soils for Woodland [3]

This section concerns the relationship between soils and trees. Its intent is to help woodland owners and operators in planning tree production.

Chicot County, at one time, was covered by virgin forests. The deep loess on Macon Ridge and the rich alluvium on the bottom lands supported some of the best hardwoods in southeast Arkansas. The principal species were sweetgum, tupelo gum, cypress, pecan, hackberry, ash, and oak—southern red, cherrybark, water, willow, Nuttall, Shumard, white, cow, and overcup.

Overcutting, wildfire, and, in recent years, land clearing have reduced the original forests to about 44 percent of the total land area. Levees now protect most areas from floods, and many areas can be artificially drained; thus the trend has been to clear more and more areas, as fast as the economy permits. It is expected that land clearing will continue in this county, and for this reason woodland interpretations are given only for those soils likely to remain wooded.

[3] JAMES T. BEENE, woodland conservationist, Soil Conservation Service, assisted in the preparation of this section.

Woodland Suitability Groups

The wooded soils in Chicot County have been placed in three woodland suitability groups. Each group consists of soils that have similar characteristics; thus the soils in each of the groups produce tree crops of similar quality and quantity and respond similarly to the same management. These groups are listed in table 5.

The factors considered in placing a soil in a woodland group include (1) potential productivity for several kinds of trees, (2) species preferred for planting and species to favor in managing existing woodland, and (3) critical soil-related hazards and limitations to be considered in woodland management. These factors are explained as follows:

Potential productivity indicates the amount of wood crops a soil can produce under a given level of management. In table 5, potential productivity for given tree species is expressed as a site class. A site class, as used in this report, is the average height of dominant trees (the tallest trees in the stand), to the nearest 10-foot interval, at age 30 for cottonwood and age 50 for other species.

A site class can be converted to a volumetric prediction of growth and yield, and the prediction can be shown in different common units of wood measurement such as board feet. Predictions of average yearly growth per acre, based on published research (*2, 7*),[4] are given in table 5.

Species preferred for planting and species to favor in managing existing woodland were determined on basis of growth rate, expected commercial value, quality of products, resistance to hazards, and degree of soil-related limitations. Those species selected were classed as *preferred* or *acceptable.* The species are listed in table 5.

Soil-related hazards and limitations to be considered in woodland management are plant competition, equipment limitations, and hazard of erosion. These also are given, where applicable, in table 5.

The rating for plant competition reflects the degree to which unwanted trees, shrubs, and vines invade an area, following the removal of the tree canopy. Also, it reflects the rate of invasion and the degree to which the invaders impede the regeneration and growth of desirable volunteer species or compete with newly planted trees. Where competition is of little or no consequence, the rating is *slight.* The rating is *moderate* where competition does not impede natural regeneration but some weeding is necessary to obtain a well-stocked stand of desirable trees. The rating is *severe* where competition invades openings quickly and impedes natural regeneration of preferred species.

[4] Italic numbers in parentheses refer to Literature Cited, page 55.

TABLE 5.—*Woodland suitability groups, their potential productivity, and ratings for hazards and limitations affecting management*

Woodland suitability groups and soil symbols	Suitable species[1]		Potential productivity			Principal hazards and limitations
	Preferred	Acceptable	Species	Site class[2]	Average yearly growth per acre[3]	
					Bd. ft. (Doyle rule)	
Group 1: GrA, GrB, GrB2, GrC, GrC2, GrD2.	Shortleaf pine and loblolly pine.	Mixed oak-gum.	Shortleaf pine Loblolly pine Mixed oak-gum	70 80 80	390 440 195	Moderate equipment limitations; moderate or severe erosion hazard; moderate plant competition.
Group 2: CaA, CaB, CGB, CHA, He.	Shortleaf pine and loblolly pine.	Mixed oak-gum and sweetgum.	Shortleaf pine Loblolly pine Mixed oak-gum Sweetgum	70 80 80 80	390 440 195 215	Moderate equipment limitations; moderate or severe plant competition; Henry soils may need surface drainage for the preferred species.
Group 3: Mu, PeA, PeU, Pr, PtA, PtU, ShA, ShU, Wa.	Cottonwood, sweetgum, and mixed oak-gum.	None.	Cottonwood Sweetgum Mixed oak-gum	90 90 90	350 315 290	Severe equipment limitations; severe plant competition; surface drainage may be needed.

[1] Species preferred for planting and species to favor in existing woodland.
[2] A site class is the average height of dominant trees at age 30 for cottonwood and age 50 for the other species. The site class shown is the center of a 10-foot class. The site class for one of the major species in each of the woodland groups (southern red oak for groups 1 and 2 and cherrybark oak for group 3) was used as an indicator in determining site class for the oak and gum mixture.
[3] Yield conversion based on well-stocked, managed stands of pines to age 60, cottonwoods to age 35, and other hardwoods to age 70. Pine yields estimated using Georgia Forest Research Council Rpt. No. 6 (*2*); hardwood yields estimated using USDA Agr. Handb. 181 (*7*).

In Chicot County, wetness of the soils, texture of the surface layer, and frequency and duration of overflows determine the limitation on the use of equipment. The limitation is *slight* if the use of equipment is restricted only for short periods after heavy rainfall. It is *moderate* if the restriction lasts from December to March. It is *severe* if equipment can be used only during the driest months—July, August, September, and October.

Steepness of slope is the major factor in rating the hazard of erosion. Generally, the hazard is rated *slight* on slopes of 0 to 3 percent, *moderate* on slopes of 3 to 8 percent, and *severe* on slopes of more than 8 percent.

Engineering Applications[5]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, water storage facilities, erosion control structures, drainage systems, and sewage disposal systems. The properties most important to the engineer are shear strength, texture, plasticity, and permeability to water. Consolidation characteristics, depth to unconsolidated material, topography, and degree of acidity or alkalinity are perhaps as important. These properties and characteristics are discussed in this section.

With the use of the soil map for identification, the engineering interpretations reported here can be used to—

1. Make soil and land use studies that will aid in selecting and developing industrial, municipal, business, residential, and recreational sites.
2. Make preliminary estimates of soil properties for use in the planning of soil and water conservation systems, including systems for surface and internal drainage and for storage and supply of water.
3. Make preliminary evaluations of soil conditions that will aid in selecting locations for highways and airports and in planning detailed investigations of the selected locations.
4. Locate probable sources of gravel, sand, and other construction material.
5. Correlate performance of engineering structures with types of soil and thus develop information that will be useful in overall planning, designing, and maintaining of other engineering structures.
6. Determine the suitability of soil types for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from other published maps, reports, and aerial photographs in preparing special maps and reports for engineering use.
8. Develop preliminary estimates for construction purposes pertinent to a particular area.
9. Develop working schedules for construction.
10. Help in the appraisal of areas that have potential engineering use.

[5] This section was prepared with the assistance of WILLIAM E. ARNOLD, agricultural engineer, Soil Conservation Service. It includes information and recommendations from the Arkansas State Highway Department, the U.S. Army Corps of Engineers, and the U.S. Bureau of Public Roads.

It should be emphasized that the engineering interpretations reported here 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 here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some terms used by soil scientists may not be familiar to engineers, and other terms have special meanings in soil science. Many of the terms soil scientists use in describing soils are defined in the Glossary at the back of this report. Other parts of this report, particularly the section "Descriptions of the Soils," can be both informative and useful to the engineer.

Engineering Classification Systems

Two systems of classifying soils are in general use among engineers. These systems are explained in the paragraphs that follow.

Most highway engineers classify soils according to the system approved by the American Association of State Highway Officials (AASHO). This system of classification is based on gradation, liquid limit, plasticity, and field performance of soils in highways. In this system, soil material is indicated by a group index number. The groups range from A-1, which consists of gravelly soils of high bearing capacity (the best soils for subgrade), to A-7, which consists of clayey soils that have low strength when wet (the poorest soils for subgrade). Within each group, the relative engineering value of the soil material is indicated by a group index number. Group indexes range from 0 for the best material to 20 for the poorest. The group index is shown in parentheses following the soil group symbol, for example, A-4(8).

Some engineers prefer to use the Unified soil classification system established by the Corps of Engineers, U.S. Army (*8*). In this system, soils are identified according to their texture and plasticity and are grouped according to their performance as engineering construction materials. Soils are identified as coarse grained (eight classes), fine grained (six classes), and highly organic (one class).

Table 6 shows the AASHO and the Unified classification of specified soils in the county as determined by laboratory tests. Table 7 shows the estimated classification of all soils in the county according to both systems. For a concise explanation of the AASHO and the Unified systems of classification, see the PCA Soil Primer (*6*).

Engineering Test Data

To help evaluate the soils for engineering purposes, samples from 11 profiles of 8 soil series were tested in accordance with standard procedures. Table 6 gives the results of the tests.

The two engineering classifications given each soil sample in table 6 are based on the liquid limit, the plasticity index, and the data obtained by mechanical analysis.

The liquid limit and the plasticity index indicate the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a dry state, the material changes from semisolid to plastic. As the moisture content is further increased, the material changes from plastic to liquid. The *plastic limit* is the moisture content at which the material changes from semisolid to plastic. The *liquid limit* is the moisture content at which the material changes from plastic to liquid. The *plasticity index* is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which the soil material is plastic. Some silty and sandy soils are nonplastic; that is, they do not change to plastic at any moisture content.

Table 6 also gives moisture-density (compaction) data for the tested soils. In the moisture-density test, soil material is compacted into a mold several times, each time at a successively higher moisture content but with the compactive effort remaining constant. The dry density (unit weight) of the compacted material increases as the moisture content increases, until the optimum moisture content is reached. After that, the dry density decreases as the moisture content increases. The highest dry density obtained in the compaction test is the *maximum dry density*, and the corresponding moisture content is the *optimum moisture*. Moisture-density data are important in earthwork because, as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density at approximately optimum moisture content.

Engineering Descriptions of the Soils

Table 7 gives a brief description of all the soils mapped in Chicot County. Also, it gives estimates of some of the soil characteristics significant in engineering, and it shows the engineering classification of the soil material in the principal horizons. This table excludes Gullied land and Mixed alluvial land, both of which are miscellaneous land types. On-site studies are necessary to determine the engineering potential of these land types because their soil material is variable.

The data in table 7 are based on laboratory tests, on experience with the same kinds of soil in other counties, and on information presented in other parts of this report.

Interpretation of the Soils for Engineering

Table 8 gives, for each soil series, suitability ratings for specific purposes and soil features affecting the location of highways and the installation of engineering structures that help to conserve soil and water on farmlands. The miscellaneous land types—Gullied land and Mixed alluvial land—are excluded from this table because of the variability of their soil material.

The ratings for adaptability to winter grading reflect the suitability of the soils for earthwork in winter and early in spring. These ratings are based on soil drainage and on the workability of the soils when they are wet.

Many soils in this county have a high water table for extended periods each year. Roads across these soils must be constructed on an embankment that is at least 4 feet above the probable high water mark. A minimum of 2 feet of embankment is needed in all locations.

The soils in Chicot County, for the most part, are clayey and very poorly drained. They have a very plastic surface layer that is unstable if saturated. To prevent saturation, surface outlets are needed.

These clayey soils shrink when dry and swell when wet. If these soils, as subgrade, are too wet when the pavement is laid, they will shrink along the edges of the pavement as they dry, and the pavement likely will crack. If these soils are too dry, they will swell as they absorb moisture, and the pavement will warp. Pavements laid over plastic soils will crack and warp less if a thick layer of less plastic soil material is used as a foundation course beneath the pavement. This foundation course should extend through the road shoulder to provide adequate drainage.

Clay soil material should be covered with a porous base course of sand and gravel to prevent pumping action under traffic. A thin layer of sand over the clay is desirable to minimize intrusion of clay into the overlying granular base course material. Clay material is most subject to pumping action, but other material also is affected, especially if an undrained fragipan is only a few inches or feet below the pavement.

One way to control shrinking and swelling of subgrade material is to make road shoulders wide and slopes less steep than normal. Another way is to compact the subgrade material to maximum density at or slightly above the optimum moisture content, as determined by the AASHO compaction test.

Clay soils generally are not suitable as foundations for multiple-story buildings. Foundations on these soils require excessive steel reinforcing. In recent years, however, spread-bottom footings have been used with reasonable success to support heavy buildings on clay soils. The footings are set on confined sandy sublayers or are taken to a depth where the moisture content is naturally uniform. Reinforced concrete pilings are brought up to the surface and capped with reinforced concrete grade beams.

Gravel in quantity is not available in this county, except in the bed of the Mississippi River, but sand with a PI (plasticity index) of less than 6 is found in some places, generally along high banks or at the bottom of old bayous. About 8 to 10 feet of overlying material must be removed to get to the sand. This sand can be used for highway subbase and is suitable for surface use if stabilized by treatment with cement or bituminous binders. Water-bearing sand may be found at a depth of more than 15 feet in some areas. Aggregate for concrete is not available in this county. Bedrock does not outcrop anywhere, for it is more than 100 feet below the surface in all parts of the county.

Frost action does not extend to a depth of more than 6 inches, so freezing is not a serious problem in construction.

Two basic engineering problems encountered on most farms in Chicot County are removing excess water economically without causing soil erosion and providing and using water for irrigation.

TABLE 6.—*Engineering*

[Tests performed by the Arkansas State Highway Department in cooperation with the U.S. Department of Commerce, Bureau

Soil name and location	Parent material	Arkansas report No. S-62-Ark.-	Depth	Horizon
Calloway silt loam:			*In.*	
NE¼NE¼ sec. 36, T. 19 S., R. 3 W.	Loess.	9-11-1	0 to 8	Ap
		9-11-5	29 to 72	Bx3
Dundee silt loam:				
NE¼SE¼ sec. 36, T. 16 S., R. 3 W. (Modal)	Recent alluvium.	9-5-2	6 to 13	A2
		9-5-4	20 to 49	B3
		9-5-5	49 to 72+	C
SW¼SE¼ sec. 23, T. 14 S., R. 2 W. (Less clay in B horizon)	Recent alluvium.	9-6-1	8 to 20	A2
		9-6-2	60 to 72	C3
Gallion silt loam:				
SW¼SE¼ sec. 17, T. 15 S., R. 2 W. (Modal)	Recent alluvium.	9-4-2	8 to 19	A2
		9-4-4	26 to 39	B2
		9-4-5	39 to 72	C
Grenada silt loam:				
NE¼NE¼ sec. 27, T. 18 S., R. 2 W. (Modal)	Loess.	9-10-2	3 to 10	A2
		9-10-4	25 to 41	Bx1
Hebert silt loam:				
NW¼SE¼ sec. 7, T. 14 S., R. 3 W. (Modal)	Recent alluvium.	9-1-1	0 to 4	Ap1
		9-1-4	16 to 27	B2
		9-1-7	51 to 72+	C2
SW¼NW¼ sec. 26, T. 13 S., R. 3 W. (More clay in B and C horizons)	Recent alluvium.	9-3-1	9 to 27	B1
		9-3-2	43 to 72	C
NW¼NE¼ sec. 7, T. 14 S., R. 3 W. (Less clay in B horizon)	Recent alluvium.	9-2-1	4 to 10	B1
		9-2-2	17 to 25	B22
		9-2-3	25 to 60	C1
Henry silt loam:				
NW¼NW¼ sec. 11, T. 19 S., R. 2 W. (Modal)	Loess.	9-9-3	13 to 29	Bx1
		9-9-5	42 to 72	Bx3
Portland clay:				
SW¼NW¼ sec. 19, T. 16 S., R. 3 W. (Modal)	Recent alluvium.	9-7-3	17 to 72	C2
Sharkey clay:				
NE¼SE¼ sec. 36, T. 16 S., R. 2 W. (Modal)	Recent alluvium.	9-8-2	4 to 90	C

[1] Based on AASHO Designation: T 99-57, Method A (*1*).
[2] Mechanical analysis according to AASHO Designation: T 88-57 (*1*). Results by this procedure may differ 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 analysis data in this table are not suitable for naming textural classes for soils.

Surface drainage is necessary because about 65 percent of the agricultural acreage in the county is heavy clay that has an average infiltration rate of less than 0.05 inch per hour and because the average slope is approximately 0.4 foot per 100 feet. Natural drains are utilized where feasible, but, for the most part, outlets are provided by local drainage districts in cooperation with the U.S. Army Corps of Engineers and the Soil Conservation Service. Drainage ditches are easily constructed, except in areas of Bowdre soils. Silt lenses and water-bearing sands in these soils prevent excavation to a depth of more than 8 feet.

The surface drainage system in Chicot County consists of a main ditch, lateral ditches, field ditches, and water furrows or quarter drains. The furrows and quarter drains direct water to the field drains. They can be used to open small local depressions. These small ditches are made by the farm plow as needed throughout the growing season. They should be run in the direction of the greatest fall, unless an erosive slope will thus develop.

test data

of Public Roads, according to standard procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Moisture-density data [1]		Mechanical analysis [2]						Classification	
		Percentage passing sieve—				Liquid limit	Plasticity index		
Maximum dry density	Optimum moisture	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)			AASHO	Unified [3]
Lb. per cu. ft.	*Pct.*								
102	18	100	98	96	94	30	7	A-4(8)	ML-CL.
101	20	100	96	93	90	40	16	A-6(10)	ML-CL.
108	17	----	----	100	90	28	7	A-4(8)	ML-CL.
104	19	----	----	100	97	29	5	A-4(8)	ML-CL.
93	26	----	----	100	99	60	27	A-7-5(19)	MH.
105	17	----	----	100	96	(4)	(4)	A-4(8)	ML.
102	20	----	100	99	98	35	13	A-6(9)	ML-CL.
106	15	----	100	99	97	(4)	(4)	A-4(8)	ML.
106	19	----	----	100	99	35	12	A-6(9)	ML-CL.
105	17	----	----	100	98	(4)	(4)	A-4(8)	ML.
103	18	----	100	99	96	31	9	A-4(8)	ML-CL.
105	19	100	99	97	95	31	4	A-4(8)	ML.
101	19	100	99	96	88	31	6	A-4(8)	ML.
99	23	----	100	99	96	55	30	A-7-6(19)	CH.
104	17	----	----	100	51	(4)	(4)	A-4(3)	ML.
86	33	----	----	100	97	81	49	A-7-5(20)	CH.
109	15	----	100	99	95	23	4	A-4(8)	ML-CL.
109	14	----	----	100	97	(4)	(4)	A-4(8)	ML.
106	19	----	----	100	99	34	11	A-6(8)	ML-CL.
108	16	----	----	100	82	(4)	(4)	A-4(8)	ML.
106	18	[5] 98	94	91	89	37	16	A-6(10)	CL.
102	21	100	99	96	93	45	22	A-7-6(14)	CL.
87	32	100	99	98	96	89	53	A-7-5(20)	CH.
88	29	----	----	100	98	80	42	A-7-5(20)	MH-CH.

[3] Soil Conservation Service and Bureau of Public Roads have agreed to consider that all soils having plasticity indexes within two points from A-line are to be given a borderline classification. Examples of borderline classifications obtained by this use are ML-CL and MH-CH.

[4] Nonplastic.

[5] One hundred percent passed the ⅜-inch sieve.

The optimum slope of these ditches, or rows, for all purposes is 0.1 to 0.3 foot fall per 100 feet.

The field ditches, which collect water from the individual rows, are of the flat V type. Their side slopes are 6:1 or less, and their minimum depth is 0.8 foot. The field ditches drain into the larger lateral ditches, and these, in turn, drain into the main ditch. Lateral ditches are a minimum of 2 feet deep and are 4 feet wide at the bottom. Their side slopes are 1½:1. The main drainage ditch, in places, is constructed and used jointly by a small number of farmers.

Although the annual precipitation in the county is about 50 inches, the rainfall pattern is uneven. As a result, irrigation is needed in some periods each year for favorable yields of certain crops. Rainfall is deficient or is poorly distributed during June and the early part of July when a plant is developing stem, leaf, and flower. Moisture in the soil is lowest and evaporation is highest from about mid-July to about the end of September. During this period a plant is developing fruit and thus needs the greatest amount of moisture.

In this county the principal sources of water for irrigation are beneath the soil, where ground water occurs in adequate amounts, and farm ponds or reservoirs, where surface runoff collects.

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TABLE 7.—*Brief description of the soils, and their*

Map symbol	Soil	Description of soil	Depth to seasonal high water table [1]	Depth from surface	Classification
					USDA texture
			Feet	*Inches*	
BoA	Bowdre silty clay loam, 0 to 1 percent slopes.	About 13 to 19 inches of silty clay loam and clay over stratified clay loam, silt loam, fine sandy loam, and loamy fine sand; developed from Mississippi River alluvium.	3	0 to 5	Silty clay loam
BoU	Bowdre silty clay loam, gently undulating.			5 to 13	Clay
				13 to 17	Sandy clay loam
				17 to 45	Silt loam
				45 to 68	Loamy sand
CaA	Calloway silt loam, 0 to 1 percent slopes.	Calloway silt loam: 2 to 3 feet of silt loam over silty clay loam or silt loam; developed from loessal materials. For properties of Grenada silt loam, see description of the Grenada soils; for properties of Henry silt loam, see description of Henry silt loam.	4	0 to 8	Silt loam
CaB	Calloway silt loam, 1 to 3 percent slopes.			8 to 15	Silt loam
CGB	Calloway-Grenada silt loams, 0 to 3 percent slopes.			15 to 21	Silt loam
CHA	Calloway-Henry silt loams, 0 to 2 percent slopes.			21 to 29	Silty clay loam
				29 to 72	Silty clay loam
Co	Commerce loam.	About 3 feet of loam; some lenses of silty clay loam to clay at a depth below 3 feet; developed from Mississippi River alluvium.	3	0 to 6	Loam
				6 to 22	Loam
				22 to 56	Silt loam
Cm	Commerce silty clay loam.	About 8 to 17 inches of clayey material over silt loam; developed from Mississippi River alluvium.	3	0 to 6	Silty clay loam
				6 to 14	Silty clay loam
				14 to 52	Silt loam
DnA	Dundee silt loam, 0 to 1 percent slopes.	About 12 to 24 inches of silt loam over 6 to 12 inches of silty clay loam that, in turn, is over 2 to 3 feet of silt loam; developed from Mississippi River alluvium.	3	0 to 6	Silt loam
DnU	Dundee silt loam, gently undulating.			6 to 13	Loam
				13 to 20	Silty clay loam
				20 to 49	Silt loam
				49 to 72	Silty clay
GaB	Gallion fine sandy loam, 1 to 3 percent slopes.	Gallion fine sandy loam: About 8 inches of fine sandy loam over about 9 inches of silt loam; below that is 12 to 17 inches of silty clay over silt loam; developed from Arkansas River alluvium.	5	0 to 8	Fine sandy loam
GPA	Gallion and Pulaski fine sandy loams, 0 to 1 percent slopes.			8 to 13	Silt loam
				13 to 17	Silt loam
				17 to 32	Silty clay
				32 to 60	Silt loam
		Pulaski fine sandy loam: 3 feet or more of fine sandy loam; developed from Arkansas River alluvium.	5	0 to 7	Fine sandy loam
				7 to 22	Fine sandy loam
				22 to 26	Fine sandy loam
				26 to 45	Fine sandy loam
GnA	Gallion silt loam, 0 to 1 percent slopes.	About 12 to 24 inches of silt loam over 12 to 17 inches of silty clay loam that, in turn, is over silt loam; developed from Arkansas River alluvium.	5	0 to 8	Silt loam
GnB	Gallion silt loam, 1 to 3 percent slopes.			8 to 19	Silt loam
				19 to 26	Silt loam
				26 to 39	Silty clay loam
				39 to 72	Silt loam
GrA	Grenada silt loam, 0 to 1 percent slopes.	About 3 to 3½ feet of silt loam over silty clay loam or silt loam; developed from loessal materials.	4	0 to 3	Silt loam
GrB	Grenada silt loam, 1 to 3 percent slopes.			3 to 10	Silt loam
GrB2	Grenada silt loam, 1 to 3 percent slopes, eroded.			10 to 25	Silt loam
GrC	Grenada silt loam, 3 to 8 percent slopes.			25 to 41	Silt loam
GrC2	Grenada silt loam, 3 to 8 percent slopes, eroded.			41 to 58	Silty clay loam
GrD2	Grenada silt loam, 8 to 12 percent slopes, eroded.				

See footnotes at end of table.

estimated physical and chemical properties

Classification—Continued		Percentage passing—			Available water capacity [2]	Permeability [3]	Reaction	Dispersion [4]	Shrink-swell potential
Unified	AASHO	No. 4 sieve (4.7 mm.)	No. 10 sieve (2.0 mm.)	No. 200 sieve (0.074 mm.)					
					Inches per inch of soil		*pH*		
CL–ML	A-6		100	90 to 100	0.21	Moderately slow	6.0 to 7.0	Moderate	Moderate.
CH	A-7-5		100	95 to 100	.19	Very slow	6.0 to 7.0	Low	High.
CL	A-6		100	40 to 50	.17	Moderately slow	6.0 to 7.0	Moderate	Moderate.
CL	A-4	100	95 to 100	90 to 100	.22	Moderate	6.0 to 7.0	High	Low.
SM	A-2		100	<35	.08	Rapid	6.5 to 7.5	High	Low.
CL	A-4	100	95 to 100	90 to 95	.22	Moderate	4.5 to 5.5	High	Low.
CL	A-4	100	95 to 100	90 to 95	.22	Moderate	5.0 to 5.5	High	Low.
CL	A-4	100	95 to 100	90 to 95	[5]	Moderate	5.0 to 5.5	High	Low.
CL–ML	A-6	100	95 to 100	85 to 95	[5]	Moderately slow	4.5 to 5.5	Moderate	Moderate.
CL–ML	A-6	100	95 to 100	85 to 95	[5]	Moderately slow	4.5 to 5.0	Moderate	Moderate.
CL–ML	A-4	100	95 to 100	60 to 90	.17	Moderate	6.0 to 7.0	High	Low.
CL–ML	A-4		100	60 to 90	.17	Moderate	7.0 to 8.0	High	Low.
CL	A-4		100	90 to 100	.22	Moderate	7.5 to 8.0	High	Low.
CL–ML	A-6	100	95 to 100	90 to 100	.21	Moderately slow	6.5 to 7.5	Moderate	Moderate.
CL–ML	A-6		100	90 to 100	.21	Moderately slow	7.0 to 8.0	Moderate	Moderate.
ML	A-4		100	90 to 100	.22	Moderate	7.5 to 8.0	High	Low.
CL–ML	A-4		100	90 to 100	.22	Moderate	5.5 to 6.0	High	Low.
CL–ML	A-4		100	90 to 100	.17	Moderate	6.0 to 6.5	High	Low.
CL–ML	A-6		100	95 to 100	.21	Moderately slow	6.0 to 7.0	Moderate	Moderate.
CL–ML	A-4	100	95 to 100	90 to 100	.22	Moderate	6.5 to 7.5	High	Low.
MH	A-7-5		100	95 to 100	.19	Slow to very slow	7.0 to 8.0	Low	High.
CL–ML	A-4	100	95 to 100	90 to 100	.14	Moderate	5.0 to 6.5	High	Low.
CL	A-4	100	95 to 100	90 to 100	.22	Moderate	5.0 to 5.5	High	Low.
ML	A-4		100	90 to 100	.22	Moderate	5.0 to 5.5	High	Low.
MH	A-7-5		100	95 to 100	.19	Slow	4.5 to 5.0	Moderate	High.
ML	A-4		100	90 to 100	.22	Moderate	5.0 to 5.5	High	Low.
ML	A-4	100	90 to 95	85 to 90	.14	Moderate	6.1 to 6.5	High	Low.
ML	A-4	100	90 to 95	85 to 90	.14	Moderate	6.1 to 6.5	High	Low.
ML	A-4	100	90 to 95	85 to 90	.14	Moderate	5.6 to 6.0	High	Low.
ML	A-4	100	90 to 95	85 to 90	.14	Moderate	5.6 to 6.0	High	Low.
ML	A-4	100	95 to 100	95 to 100	.22	Moderate	5.0 to 5.5	High	Low.
CL	A-4		100	95 to 100	.22	Moderate	5.0 to 5.5	High	Low.
CL	A-4		100	95 to 100	.22	Moderate	5.0 to 5.5	High	Low.
CL	A-6		100	95 to 100	.21	Moderately slow	4.5 to 5.0	Moderate	Moderate.
CL	A-4		100	95 to 100	.22	Moderate	4.5 to 5.0	High	Low.
CL–ML	A-4	100	95 to 100	90 to 95	.22	Moderate	5.0 to 5.5	High	Low.
CL–ML	A-4	100	95 to 100	90 to 100	.22	Moderate	5.0 to 5.5	High	Low.
ML	A-4	100	95 to 100	90 to 100	.22	Moderate	5.0 to 5.5	High	Low.
ML	A-4	100	95 to 100	90 to 100	[5]	Moderate	4.5 to 5.0	High	Low.
CL	A-6	100	95 to 100	90 to 100	[5]	Moderately slow	4.5 to 5.0	Moderate	Moderate.

TABLE 7.—*Brief description of the soils, and their*

Map symbol	Soil	Description of soil	Depth to seasonal high water table [1]	Depth from surface	Classification
					USDA texture
			Feet	*Inches*	
HC	Hebert and Crowley silt loams.	Hebert silt loam: 6 to 24 inches of silt loam over 12 to 29 inches of silty clay loam or silty clay that, in turn, is over 12 to 36 inches or more of silt loam, sandy loam, or fine sandy loam; developed from acid alluvium deposited by the Arkansas River.	3	0 to 4	Silt loam
				4 to 8	Silt loam
				8 to 16	Silty clay loam
				16 to 27	Silty clay
				27 to 39	Silty clay loam
				39 to 51	Silt loam
				51 to 72	Sandy loam
		Crowley silt loam: 14 to 20 inches of silt loam over silty clay to clay; clay that may be thinly stratified with sandy material is at a depth below about 3 feet; developed from silty deposits overlying Arkansas River alluvium.	3	0 to 6	Silt loam
				6 to 16	Silt loam
				16 to 22	Light silty clay loam.
				22 to 36	Silty clay
				36 to 42	Clay
He	Henry silt loam.	About 1½ to 2½ feet of silt loam over 1 foot to 1½ feet of silty clay loam that, in turn, is over 2½ feet or more of silt loam; developed from poorly drained loessal materials.	1	0 to 4	Silt loam
				4 to 13	Silt loam
				13 to 29	Silt loam
				29 to 42	Silty clay loam
				42 to 72	Silt loam
Lo	Lonoke silt loam.	Five feet or more of silt loam that developed from acid to neutral alluvium deposited by the Arkansas River.	6	0 to 7	Silt loam
				7 to 12	Silt loam
				12 to 18	Silt loam
				18 to 57	Silt loam
McA	McGehee silt loam, 0 to 1 percent slopes.	About 6 to 12 inches of silt loam over 3 feet or more of clay; developed from Arkansas River alluvium.	1	0 to 6	Silt loam
McU	McGehee silt loam, gently undulating.			6 to 14	Silt loam
				14 to 19	Silt loam
				19 to 26	Silt loam
				26 to 42	Silty clay
PeA	Perry clay, 0 to 1 percent slopes.	About 3½ feet or more of clay that cracks when dry; developed from acid alluvium deposited by the Arkansas River.	1	0 to 5	Clay
PeU	Perry clay, gently undulating.			5 to 10	Clay
				10 to 19	Clay
				19 to 25	Clay
				25 to 42	Clay
Pr	Perry silt loam, overwash.	About 6 to 12 inches of silt loam over 3½ feet or more of clay that cracks when dry; developed from Arkansas River alluvium.	1	0 to 6	Silt loam
				6 to 17	Clay
				17 to 21	Clay
				21 to 36	Clay
				36 to 46	Clay
PtA	Portland clay, 0 to 1 percent slopes.	About 3½ feet or more of clay that cracks when dry; developed from Arkansas River alluvium.	1	0 to 4	Clay
PtU	Portland clay, gently undulating.			4 to 17	Clay
				17 to 72	Clay
RoU	Robinsonville loam, gently undulating.	About 9 inches of loam over 39 or 40 inches of fine sandy loam and very fine sandy loam; below that is 1 foot to several feet of sandy material; developed from alkaline alluvium deposited by the Mississippi River.	5	0 to 9	Loam
				9 to 34	Fine sandy loam
				34 to 48	Very fine sandy loam.
				48 to 60	Sand
ShA	Sharkey clay, 1 to 3 percent slopes.	About 3½ to 16 feet of clay that cracks when dry; developed from alkaline alluvium deposited by the Mississippi River.	1	0 to 4	Clay
ShU	Sharkey clay, gently undulating.			4 to 48	Clay
Wa	Waverly silt loam.	About 2 to 2½ feet of silt loam over 1½ to 3 feet of silty clay loam; developed from acid loessal materials.	0	0 to 6	Silt loam
				6 to 30	Silt loam
				30 to 59	Silt loam

[1] In winter the water table may be higher for short periods.
[2] Based on textural classes.
[3] Estimates are for soil that is not compacted (undisturbed material).

estimated physical and chemical properties—Continued

Classification—Continued		Percentage passing—			Available water capacity [2]	Permeability [3]	Reaction	Dispersion [4]	Shrink-swell potential
Unified	AASHO	No. 4 sieve (4.7 mm.)	No. 10 sieve (2.0 mm.)	No. 200 sieve (0.074 mm.)					
					Inches per inch of soil		*pH*		
ML	A-4	100	95 to 100	85 to 95	.22	Moderate	5.0 to 5.5	High	Low.
ML	A-4	100	95 to 100	85 to 95	.22	Moderate	5.0 to 5.5	High	Low.
CL	A-6	100	95 to 100	90 to 100	.21	Moderately slow	5.0 to 5.5	Moderate	Moderate.
CH	A-7-6	100	95 to 100	95 to 100	.19	Slow	4.5 to 5.0	Low	High.
CL	A-6		100	95 to 100	.21	Slow	5.0 to 5.5	Moderate	Moderate.
ML	A-4	100	95 to 100	95 to 100	.22	Moderate	5.0 to 5.5	High	Low.
CL	A-4		100	45 to 55	.14	Moderate	5.5 to 6.0	High	Low.
ML	A-4		100	90 to 100	.22	Moderate	5.1 to 5.5	High	Low.
ML	A-4		100	90 to 100	.22	Moderate	5.1 to 5.5	High	Low.
CL	A-6		100	95 to 100	.21	Moderately slow	5.1 to 5.5	Moderate	Moderate.
CH	A-7-6		100	95 to 100	.19	Slow	5.1 to 5.5	Low	High.
CH	A-7-5		100	95 to 100	.19	Very slow	5.6 to 6.0	Low	High.
ML	A-4	100	95 to 100	90 to 95	.22	Moderate	4.5 to 5.0	High	Low.
ML	A-4	100	95 to 100	95 to 100	.22	Moderate	5.0 to 5.5	High	Low.
ML	A-4	95 to 100	90 to 95	85 to 95	(5)	Moderate	5.0 to 5.5	High	Low.
CL	A-6	95 to 100	90 to 95	85 to 95	(5)	Moderately slow	5.0 to 5.5	Moderate	Moderate.
CL	A-7-6	100	95 to 100	90 to 95	(5)	Moderate	4.5 to 5.0	High	Low.
ML	A-4	100	95 to 100	85 to 95	.22	Moderate	6.0 to 6.5	High	Low.
ML	A-4	100	95 to 100	85 to 95	.22	Moderate	5.5 to 6.0	High	Low.
ML	A-4	100	95 to 100	90 to 95	.22	Moderate	5.5 to 6.0	High	Low.
ML	A-4	100	95 to 100	90 to 95	.22	Moderate	5.0 to 5.5	High	Low.
ML	A-4	100	95 to 100	95 to 100	.22	Moderate	4.5 to 6.0	High	Low.
ML	A-4	100	95 to 100	95 to 100	.22	Moderate	5.0 to 6.0	High	Low.
CL	A-6		100	90 to 100	.22	Moderate	5.0 to 6.0	Moderate	Low.
CL	A-6		100	90 to 100	.22	Moderate	5.0 to 6.5	Low	Low.
CH	A-7-6	100	95 to 100	95 to 100	.19	Slow	4.5 to 6.0	Low	High.
CH-MH	A-7-5		100	95 to 100	.19	Very slow	5.5 to 6.0	Low	High.
CH-MH	A-7-5		100	95 to 100	.19	Very slow	5.0 to 5.5	Low	High.
CH-MH	A-7-5		100	95 to 100	.19	Very slow	5.0 to 5.5	Low	High.
CH-MH	A-7-5		100	95 to 100	.19	Very slow	5.5 to 6.0	Low	High.
CH-MH	A-7-5		100	95 to 100	.19	Very slow	7.0 to 7.5	Low	High.
ML	A-4	100	95 to 100	90 to 95	.22	Moderate	5.5 to 6.0	High	Low.
CH-MH	A-7-5		100	95 to 100	.19	Very slow	5.0 to 5.5	Low	High.
CH-MH	A-7-5		100	95 to 100	.19	Very slow	5.0 to 5.5	Low	High.
CH-MH	A-7-5		100	95 to 100	.19	Very slow	5.5 to 6.0	Low	High.
CH-MH	A-7-5		100	95 to 100	.19	Very slow	7.0 to 8.0	Low	High.
CH-MH	A-7-5	100	95 to 100	95 to 100	.19	Very slow	5.5 to 6.0	Low	High.
CH-MH	A-7-5	100	95 to 100	95 to 100	.19	Very slow	5.5 to 6.0	Low	High.
CH-MH	A-7-5	100	95 to 100	95 to 100	.19	Very slow	7.5 to 8.0	Low	High.
CL-ML	A-4	100	90 to 95	85 to 90	.17	Moderately slow	6.5 to 7.0	High	High.
CL-ML	A-4	100	90 to 95	85 to 90	.14	Moderate	7.5 to 8.0	High	Low.
CL-ML	A-4	100	90 to 95	80 to 90	.22	Moderate	7.5 to 8.0	High	Low.
SM	A-2	100	85 to 95	40 to 50	.02	Very rapid	7.5 to 8.0	High	Low.
MH	A-7-5		100	95 to 100	.19	Very slow	6.0 to 6.5	Low	High.
MH	A-7-5		100	95 to 100	.19	Very slow	6.5 to 8.0	Low	High.
ML	A-4	100	95 to 100	90 to 100	.22	Moderate	5.0 to 5.5	High	Low.
ML	A-4	100	95 to 100	90 to 100	.22	Moderate	5.0 to 5.5	High	Low.
CL	A-6	100	95 to 100	90 to 100	.22	Moderate	5.0 to 5.5	Moderate	Moderate.

[4] The rating reflects the degree to which and the rapidity with which the soil structure breaks down or slacks in water. A rating of "high" means that the soil material slacks readily.

[5] Estimates not available. The horizon is a compact fragipan and has low available moisture capacity.

TABLE 8.—*Engineering*

Soil series and map symbols [1]	Adaptability to winter grading	Tendency to slough or slide		Suitability for—		
		Cut	Fill	Base course for flexible pavement	Subbase for flexible pavement	Subgrade for rigid pavement
Bowdre (BoA, BoU)	Poor; surface drainage is impeded.	High; internal seepage in substratum.	Medium if side slopes are flat.	Not suitable	Not suitable	Not suitable
Calloway (CaA, CaB, CGB, CHA)	Poor; internal drainage is impeded.	Medium if side slopes are steep.	Low	Not suitable	Not suitable	Not suitable
Commerce (Cm, Co)	Good	Low if side slopes are steep.	Low	Poor or not suitable.	Fair	Fair
Crowley (HC)	Fair to poor	Medium	Medium	Not suitable	Not suitable	Not suitable
Dundee (DnA, DnU)	Fair	Medium	Medium	Not suitable	Not suitable	Not suitable
Gallion (GaB, GnA, GnB, GPA)	Fair	Medium	Medium	Not suitable	Not suitable	Not suitable
Grenada (GrA, GrB, GrB2, GrC, GrC2, GrD2, CGB)	Fair	Medium if side slopes are steep.	Low	Not suitable	Not suitable	Not suitable
Hebert (HC)	Fair	Medium	Medium	Not suitable	Not suitable	Not suitable
Henry (He, CHA)	Poor; internal drainage is impeded.	Medium	Low	Not suitable	Not suitable	Not suitable
Lonoke (Lo)	Good	Low if side slopes are steep.	Low	Poor or not suitable.	Fair	Fair
McGehee (McA, McU)	Fair	High	Medium	Not suitable	Not suitable	Not suitable
Perry (PeA, PeU, Pr)	Poor; internal drainage is impeded.	High	Medium if side slopes are flat.	Not suitable	Not suitable	Not suitable
Portland (PtA, PtU)	Poor; internal drainage is impeded.	High	Medium if side slopes are flat.	Not suitable	Not suitable	Not suitable
Pulaski (GPA)	Good	Low if slopes are steep.	Low	Poor or not suitable.	Fair	Fair
Robinsonville (RoU)	Good	Low	Low	Poor or not suitable.	Fair to poor	Fair
Sharkey (ShA, ShU)	Poor; internal drainage is impeded.	High	Medium if side slopes are flat.	Not suitable	Not suitable	Not suitable
Waverly (Wa)	Poor; internal drainage is impeded.	Medium	Medium	Not suitable	Not suitable	Not suitable

[1] For interpretations of the soils that make up a complex or an undifferentiated soil group, it is necessary to refer to the respective series.

interpretations

Soil features affecting irrigation	Leveling or grading		Water storage		Artificial drainage
	Degree of limitation	Optimum cut	Suitable kind of facility	Hazards	
Slow intake rate; high water-holding capacity.	Moderate to severe.	Less than 6 inches.	Enclosed	Fine sand substratum in places.	Needed; level topography and slow infiltration.
Moderate intake rate; moderate water-holding capacity.	Severe	Less than 10 inches.	Excavated	High percolation in substratum in places.	Needed; level to undulating topography.
Moderate intake rate; moderate water-holding capacity.	Moderate to severe.	Less than 6 inches.	None	Sandy substratum	Generally not needed.
Slow intake rate; moderate to high water-holding capacity.	Moderate	Less than 12 inches.	Enclosed	None	Needed; slow intake rate and level topography.
Moderate intake rate; moderate water-holding capacity.	Moderate	Less than 10 inches.	None	Sandy substratum	Needed; level to undulating topography.
Moderate intake rate; moderate water-holding capacity.	Moderate	Less than 10 inches.	None	Sandy substratum	Generally not needed.
Moderate intake rate; moderate water-holding capacity.	Severe	Less than 14 inches.	Impounded	None	Generally not needed except on 0 to 1 percent slopes.
Moderate intake rate; moderate water-holding capacity.	Moderate	Less than 10 inches.	None	Sandy substratum	Needed; level topography.
Slow intake rate; moderate water-holding capacity.	Moderate	Less than 6 inches.	Excavated	None	Needed; depressed or level topography.
Moderate intake rate; fair water-holding capacity.	Moderate	Less than 18 inches.	None	Sandy topsoil and substratum.	Generally not needed.
Slow intake rate; fair water-holding capacity.	Moderate	Less than 10 inches.	Enclosed	None	Needed; level topography.
Very slow intake rate; high water-holding capacity.	Severe	Less than 24 inches.	Enclosed	None	Needed; level topography and slow intake rate.
Very slow intake rate; high water-holding capacity.	Severe	Less than 24 inches.	Enclosed	None	Needed; level topography and slow intake rate.
Moderate intake rate; fair water-holding capacity.	Moderate	Less than 18 inches.	None	Sandy topsoil and substratum.	Generally not needed.
Slow intake rate; low water-holding capacity.	Moderate	Less than 18 inches.	None	Sandy topsoil and substratum.	Generally needed.
Very slow intake rate; high water-holding capacity.	Severe	Less than 24 inches.	Enclosed	None	Needed; level topography and slow intake rate.
Slow intake rate; moderate water-holding capacity.	(2)	(2)	Impounded	None	Needed; depressed or level topography.

[2] Leveling or grading not feasible because Waverly soils are subject to frequent overflows and are under water after heavy rains.

Most of the county is underlain by water-bearing sand and gravel that yield sufficient water for irrigation. About 1,500 to 2,000 gallons per minute with heads of 50 to 75 feet can be pumped from wells of up to 12 inches in diameter. In only one area, about 8 miles west of Eudora, is the ground water sufficiently high in chemical content as to be unsuitable for agricultural use.

Reservoirs are rather easy to construct and are becoming the preferred source of water for irrigation. Pumping water from reservoirs costs less than pumping water from wells. Furthermore, reservoirs are a dependable source of water; they contain valuable plant nutrients; and they can be used for recreation purposes. Water distribution is by an earth canal system, which may be either permanently built or constructed as needed. Normally, the canals do not need special treatment to prevent seepage.

The common types of irrigation systems used in this county are sprinkler, furrow, and contour border. Of these, the sprinkler type is least used, mainly because of the high initial cost, the high cost of operation and maintenance, and the low infiltration rate of the soils.

In the furrow system of irrigation, water is released on the high side of the field and allowed to flow along the rows or to flood across the field. This system works well on medium-textured soils, but on fine-textured soils cracks have to form before an appreciable amount of water gets into the soil. Of the three systems used in the county, this one costs least to install and to maintain. The cost of labor involved in its operation is low, but its efficiency also is low.

The contour border system, probably preferred over the others, consists of levees of uniform height built on the contour. Water flows from one level to the next, or it enters at the end of each contour interval. This system can be used to irrigate any crop. It is better adapted to fine-textured soils but is effective on medium-textured soils. The cost of labor, material, and maintenance is low; and the efficiency of the system is good.

To improve soil drainage or to better irrigate the soils, the contour of the land surface can be changed to varying degrees by using different kinds of equipment. A land plane, for example, will smooth a field, but heavy equipment is needed to carry soil from a high area to a low area in order to get a planed surface with a planned grade.

Only the soils on the loessal ridge in the southern part of the county are eroded to any great extent. Standard terraces and waterways have been installed to a minor degree, and, for the most part, critical slopes have been left in grass.

Nonagricultural Uses of the Soils

Chicot County is primarily an agricultural area, and this soil survey was made to relate chiefly to agriculture. Information contained in this survey, however, can be used to determine the degree of the limitations of the soils for other uses, including use as sites for buildings, residences, roads, camps, and golf courses.

All of the soils in Chicot County were evaluated for specific nonagricultural uses. The degree of their limitations for these uses is given in table 9. Also, if the limitation is more than slight, the chief limiting factors are given. The information contained in table 9 can be used to plan soil investigations that will reduce the time spent in laboratory sampling and testing of soils and to help locate suitable sites for buildings, residences, and recreation areas. It is not intended that this information will eliminate the need for on-site inspections.

Mixed alluvial land is excluded from table 9 because of the variability of its soil material.

The ratings in table 9 are interpreted as follows:

Very slight.—Limitations are so slight that no modification is necessary.

Slight.—Limitations are slight and easy to overcome.

Moderate.—Limitations are moderate and can be overcome or corrected by means that, in general, are practical.

Severe.—Limitations are severe and difficult to overcome; use is questionable.

Very severe.—Limitations are so severe that use is impractical.

The factors considered in determining the ratings in table 9 were: relief, flood hazard, erosion hazard, water table, percolation rate, permeability, available moisture capacity, shrink-swell potential, presumptive bearing value, traffic-supporting capacity, and trafficability as pertains to both pedestrians and light vehicles. Permeability and available moisture capacity are defined in the glossary. The other factors are explained as follows:

Shrink-swell potential.—This factor pertains to the volume change of a soil with a change in moisture content. Soils that shrink when dry and swell when wet can cause much damage to building foundations. The shrink-swell potential is influenced by the amount and kind of clay in the soil. Soils that have a low shrinkage index have very slight limitations for use as building sites; soils that have a moderate shrinkage index have slight to moderate limitations; and soils that have a high or very high shrinkage index have severe or very severe limitations.

Water table.—The highest part of the soil or underlying rock material that is saturated with water is the water table. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

A water table is described in terms of depth from the surface and length of time that the water table remains at a given depth. A soil that has a water table at a depth below 30 inches for less than 6 months and never at a depth of less than 15 inches has only slight or very slight limitations for use as building sites. A water table at a depth of less than 4 feet imposes severe limitations on the use of a soil as a septic tank field. A water table at a depth below 15 inches for more than 8 months a year moderately restricts the use of a soil as a trafficway; if the length of time is less than 8 months, the limitations are severe.

Percolation rate.—Soils have slight or very slight limitations for use as septic tank filter fields if they can take in an inch of water in less than 50 minutes. If the percolation rate is 50 to 90 minutes per inch, the limitations are severe. If the percolation rate exceeds 90 minutes per inch, the limitations are very severe.

Trafficability.—This factor is a measure of the ease with which people can move about on foot, horseback, or small vehicle over a specified soil. Limitations are slight or very slight on a loamy soil that, during the heavy use period, is not subject to flooding and does not have a water table within 30 inches of its surface. Limitations generally are severe on a clayey soil.

Presumptive bearing value.—This factor represents the calculated maximum allowable load for a compacted soil. Most building codes use presumptive bearing values to determine soil stability in connection with building foundations. Houses, on the average, require 4,200 pounds per square foot of presumptive bearing value (PBV).

Traffic-supporting capacity.—This factor reflects the ability of undisturbed soil to support moving loads and consequently its suitability for use as subgrade. In the AASHO classification system, traffic-supporting capacity is indicated by a group index number.

Relief.—Relief is to be considered in any evaluation of soils for specific purposes, for it affects erosion, drainage, aspect, scenery, filter fields for septic tanks, and trafficways.

Erosion hazard.—The inherent erodibility of a soil greatly affects its use for lawns, landscaping, golf courses, campsites, and other nonagricultural purposes.

Flood hazard.—This hazard is rated in terms of frequency and duration. Even a slight flood hazard greatly lowers the rating of a soil for uses involving dwellings, buildings, and highways.

Formation and Classification of the Soils

In this section, the factors of soil formation and their relation to the soils in Chicot County are discussed; the classification of the soils is discussed; and laboratory data are given for selected soil series.

Factors of Soil Formation

Soil is formed through the interaction of climate, parent material, living organisms, topography, and time —the five factors of soil formation. The relative importance of each factor differs from place to place. In some places, one factor may dominate in the formation of the soil and fix most of its properties.

Climate

In Chicot County, climate has been a uniform factor in soil formation. Summers are long and moderately hot, and winters are short and moderately cold. (For data on temperature and rainfall, see table 13, page 55.)

The young alluvial soils that formed in sediment deposited by the Mississippi River have been little affected by the local climate. Weathering has not occurred, because the soils have been in place too short a time. Furthermore, the sediment has come mostly from areas where weathering is not intense. Thus, these young soils have many characteristics of soils of drier climates.

Many alluvial soils, however, are intermediate in development. These soils, particularly those that formed in fine-textured sediment, are medium to high in bases, especially in the lower layers. Their parent material is only moderately leached and retains most of its original chemical and mineralogical characteristics.

Parent material

Parent material is the unconsolidated mass from which a soil forms. It determines the chemical and mineralogical composition of the soil. In Chicot County most of the soils formed in one of two kinds of parent material: Mississippi Valley loess or alluvium deposited by the Arkansas and Mississippi Rivers.

The Mississippi Valley loess, which is of Pleistocene age, is silt loam to silty clay loam that has been moderately leached. The material generally is acid.

The older alluvium, from which the extensive old natural levees have formed, is permeable sandy material that has been moderately leached; it commonly is acid. In some places the alluvium is fine-textured material that has been less thoroughly leached. Parent material of this type generally is high in bases and contains clay that is dominantly montmorillonite.

Recent Mississippi River alluvium consists primarily of water-laid sediment from an area covering about 23 States through which the Mississippi River and its tributaries flow. Typically, this alluvium is brown to gray in color and slightly acid to alkaline in reaction.

All of the alluvium ranges widely in texture because of the pattern of deposition. Before man-made levees were built, floodwater from the Mississippi River spread out over the flood plain. The coarse sediments (fine sand and silt) carried in suspension were dropped in bands parallel to and near the river channel. These low bands, or ridges, formed natural levees. The fine material (clay) settled when the flood receded and left water standing in the lowlands.

The simple pattern of coarse sediment near the channel and fine sediment in the slack-water lowlands is common along the Mississippi River, as well as near old, abandoned courses of the river in the flood plain. In some places old natural levees have been cut out, and in other places sandy sediment has been deposited on top of slack-water clay. Thus, the normal pattern of sediment distribution from a single channel has been partly or completely destroyed in many places, and beds of alluvium of widely contrasting textures may be superimposed. The system of man-made levees that parallels the present channel has greatly reduced the size of the area subject to flooding.

Living organisms

Living organisms are important in soil formation. Bacteria, fungi, and other micro-organisms aid in weathering and decomposing organic matter. Earthworms and other animals, including rodents and crawfish, help to mix the soil. Vegetation furnishes organic matter and aids in transferring elements from the subsoil to the surface layer. It also alters the soil microclimate.

The kinds and numbers of plants and animals that live on and in the soil are largely determined by climate but may be influenced by relief, parent material, and the age of the soil.

TABLE 9.—*Degree of limitation of the soils for selected*

Soil and symbol	Description of soil	Dwellings	
		Public or community sewage system	Septic tank filter field
Bowdre silty clay loam: (BoA, BoU)	Level to gently undulating; moderately well drained; 10 to 20 inches of clayey material underlain by variable, coarser textured material.	Severe; shrink-swell potential and water table.	Severe; shrink-swell potential and water table.
Calloway silt loam: (CaA, CaB)	0 to 3 percent slopes; somewhat poorly drained silt loam overlying a fragipan.	Moderate; water table and presumptive bearing value.	Very severe; percolation rate, water table, and presumptive bearing value.
Calloway-Grenada silt loams: (CGB)	0 to 3 percent slopes; somewhat poorly drained or moderately well drained silt loam overlying a fragipan.	Moderate; water table and presumptive bearing value.	Severe; percolation rate, water table, and presumptive bearing value.
Calloway-Henry silt loams: (CHA)	0 to 2 percent slopes; poorly drained or somewhat poorly drained silt loam overlying a fragipan.	Severe; water table and presumptive bearing value.	Very severe; percolation rate, water table, and presumptive bearing value.
Commerce silty clay loam: (Cm)	Level; moderately well drained; about 18 inches of silty clay loam underlain by coarser textured material.	Slight	Slight; water table
Commerce loam: (Co)	Level, moderately well drained loam	Slight	Slight; water table
Dundee silt loam: (DnA, DnU)	Level to gently undulating, somewhat poorly drained silt loam.	Moderate; water table and shrink-swell potential.	Severe; percolation rate, water table, and shrink-swell potential.
Gallion fine sandy loam: (GaB)	1 to 3 percent slopes; well-drained fine sandy loam.	Slight	Moderate; percolation rate
Gallion silt loam: (GnA, GnB)	0 to 3 percent slopes; well-drained silt loam	Slight	Moderate; percolation rate
Gallion and Pulaski fine sandy loams: (GPA)	0 to 1 percent slopes	Slight	Moderate; percolation rate
Grenada silt loam: (GrA, GrB, GrB2, GrC, GrC2)	0 to 8 percent slopes; moderately well drained silt loam overlying a fragipan.	Slight	Very severe; percolation rate.
Grenada silt loam: GrD2)	8 to 12 percent slopes	Moderate; relief	Severe; percolation rate and relief.
Gullied land: (Gu)	Steep, somewhat poorly drained or moderately well drained areas of loessal material.	Very severe; relief	Very severe; relief
Hebert and Crowley silt loams: (HC)	Level or depressed, somewhat poorly drained silt loam overlying a fragipan.	Severe; water table and presumptive bearing value.	Very severe; percolation rate, water table, and presumptive bearing value.
Henry silt loam: (He)	Level or depressed, poorly drained silt loam overlying a fragipan.	Severe; water table and presumptive bearing value.	Very severe; percolation rate, water table, and presumptive bearing value.
Lonoke silt loam: (Lo)	Level, well-drained silt loam	Slight	Moderate; percolation rate.
McGehee silt loam: (McA, McU)	Level to gently undulating somewhat poorly drained silt loam.	Slight or moderate; water table.	Severe; percolation rate and water table.
Perry clay: (PeA, PeU)	Level to gently undulating, poorly drained clay; high shrink-swell potential.	Severe; shrink-swell potential, presumptive bearing value, and water table.	Very severe; percolation rate, shrink-swell potential, water table, and presumptive bearing value.
Perry silt loam, overwash: (Pr)	Level, poorly drained; about 1 foot of silt loam underlain by clay.	Severe; shrink-swell potential.	Very severe; percolation rate and shrink-swell potential.
Portland clay: (PtA, PtU)	Level to gently undulating, somewhat poorly drained clay; high shrink-swell potential.	Severe; shrink-swell potential, presumptive bearing value, and water table.	Very severe; percolation rate, shrink-swell potential, and water table.
Robinsonville loam: (RoU)	Gently undulating, well-drained loam	Slight	Slight

nonagricultural uses, and the chief limiting factors

Recreation: Campsite	Recreation: Picnic area	Recreation: Intensive play area	Recreation: Golf fairway	Light industry	Trafficway
Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Moderate; shrink-swell potential and presumptive bearing value.	Severe; traffic-supporting capacity and water table.
Moderate; trafficability.	Moderate; trafficability.	Moderate; trafficability.	Moderate; trafficability.	Moderate; presumptive bearing value and water table.	Moderate; traffic-supporting capacity and water table.
Moderate; trafficability.	Moderate; trafficability.	Moderate; trafficability.	Moderate; trafficability.	Moderate; presumptive bearing value and water table.	Moderate; traffic-supporting capacity and water table.
Severe; trafficability.	Severe; trafficability.	Very severe; trafficability.	Severe; trafficability.	Severe; presumptive bearing value and water table.	Severe; traffic-supporting capacity and water table.
Moderate; trafficability.	Moderate; trafficability.	Moderate; trafficability.	Moderate; trafficability.	Moderate; shrink-swell potential and presumptive bearing value.	Moderate; traffic-supporting capacity.
Slight	Slight	Slight	Slight	Moderate; presumptive bearing value.	Moderate; traffic-supporting capacity.
Moderate; trafficability.	Moderate; trafficability.	Moderate; trafficability.	Moderate; trafficability.	Moderate; presumptive bearing value, water table, and shrink-swell potential.	Moderate; water table and traffic-supporting capacity.
Slight	Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Moderate; trafficability.	Slight	Moderate; presumptive bearing value.	Moderate; traffic-supporting capacity.
Moderate; relief	Moderate; relief	Moderate; relief	Moderate; relief	Moderate; relief and presumptive bearing value.	Moderate; traffic-supporting capacity.
Very severe; relief	Very severe; relief	Very severe; relief and erosion hazard.	Very severe; relief and erosion hazard.	Severe; relief	Severe; traffic-supporting capacity.
Severe; trafficability.	Severe; trafficability.	Very severe trafficability.	Severe; trafficability.	Severe; presumptive bearing value and water table.	Severe; traffic-supporting capacity and water table.
Severe; trafficability.	Severe; trafficability.	Very severe trafficability.	Severe; trafficability.	Severe; presumptive bearing value and water table.	Severe; traffic-supporting capacity and water table.
Slight	Slight	Slight	Slight	Moderate; presumptive bearing value.	Moderate; water table and traffic-supporting capacity.
Slight	Slight	Slight	Slight	Severe; water table and presumptive bearing value.	Severe; traffic-supporting capacity and water table.
Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Severe; shrink-swell potential, presumptive bearing value, and water table.	Severe; traffic-supporting capacity and water table.
Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Severe; shrink-swell potential, presumptive bearing value, and water table.	Severe; traffic-supporting capacity and water table.
Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Severe; shrink-swell potential, presumptive bearing value, and water table.	Severe; traffic-supporting capacity and water table.
Slight	Slight	Slight	Slight	Slight	Slight.

TABLE 9.—*Degree of limitation of the soils for selected*

Soil and symbol	Description of soil	Dwellings	
		Public or community sewage system	Septic tank filter field
Sharkey clay: (ShA, ShU)	Nearly level to gently undulating, poorly drained clay; high shrink-swell potential.	Severe; shrink-swell potential, presumptive bearing value, and water table.	Very severe; percolation rate, shrink-swell potential, presumptive bearing value, and water table.
Waverly silt loam: (Wa)	Level, poorly drained silt loam	Very severe; flood hazard, water table, and presumptive bearing value.	Very severe; flood hazard, water table, presumptive bearing value, and percolation rate.

Before settlement of the county, native vegetation had more influence on soil development than did animal activity. The native vegetation of the county was mostly hardwoods: oak, pecan, ash, sweetgum, elm, and hackberry on the better drained soils and cypress, hackberry, and water-tolerant oak on the poorly drained soils. Cottonwood and willow grew on coarse-textured soils that were frequently flooded. Canebrakes covered large areas on the bottom lands and on the more fertile uplands.

The different types of vegetation were generally associated with differences in soil properties. The early settlers used native vegetation as their chief indicator of soil capability and suitability for agriculture.

Topography

Topography influences soil formation chiefly through its effect on drainage, erosion, plant cover, temperature, and the time during which parent materials are exposed. Its influence is modified by the other four factors of soil formation.

In Chicot County, the range in topography is relatively narrow. The broad bottom lands are level to gently sloping, and the uplands are level to sloping.

Time

The length of time required for a soil to form depends largely on the other factors of soil formation, of which climate and parent materials are probably the most important. Less time is generally required for a soil to form in humid, warm regions that have rank vegetation than in dry or cold regions that have scanty vegetation. Less time is required for a soil to form from coarse-textured parent material than from fine-textured material, all else being equal.

The soils in the Mississippi River bottom lands and the soils along streams have been in place for only a short time. Probably the oldest of these alluvial soils are only a few hundred to a few thousand years old. Genetic horizons generally are faint, and the original stratification of the parent materials has been little changed by soil development. Most of the bottom-land soils are protected against floods by man-made levees, but some areas are not protected, and these receive fresh sediment with each flood.

The soils on the loessal uplands are of Pleistocene age, probably a few thousand to 10 or 12 thousand years old.

Classification of the Soils

Soils are placed in narrow classes to better organize knowledge of their behavior and relate this knowledge to individual farms or other tracts of land. They are placed in broad classes to better study and compare their behavior in areas larger than a county.

In the comprehensive system of soil classification followed in the United States, soils are placed in six categories. Beginning with the highest and most inclusive, the categories are the order, the suborder, the great soil group, the family, the series, and the type. In the highest category, soils are grouped into three orders—zonal, intrazonal, and azonal—whereas thousands of soil types are recognized in the lowest category. The suborder and family categories have never been fully developed and thus have been little used. Attention has been given mainly to the classification of soils into soil types and series within counties or comparable areas and to the subsequent grouping of series into great soil groups and soil orders.

The lower categories of taxonomic soil classification, the series and the type, are explained in the section "How This Soil Survey Was Made." The soil phase, a subdivision of the soil type, is also explained in that section.

In table 10 the soil series of this county are arranged by orders and great soil groups, and some distinguishing characteristics of each soil series are shown. In the pages that follow, the characteristics of each order, great soil group, and series are given, and a representative profile of a soil in each series is described.

Because they are miscellaneous land types, Gullied land and Mixed alluvial land have not been classified and are excluded from table 10.

Azonal order

The azonal order consists of soils that have little or no horizon development because of their youth or because the nature of the parent material or of the topography prevents their normal development.

The azonal soils in Chicot County are classified in the Alluvial great soil group.

ALLUVIAL SOILS

This great soil group consists of azonal soils that formed in recent deposits of alluvium. The alluvium has been modified little or not at all by soil-forming processes.

nonagricultural uses, and the chief limiting factors—Continued

Recreation				Light industry	Trafficway
Campsite	Picnic area	Intensive play area	Golf fairway		
Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Severe; trafficability.	Severe; shrink-swell potential, presumptive bearing value, and water table.	Severe; traffic-supporting capacity and water table.
Severe; trafficability.	Severe; trafficability.	Very severe; trafficability.	Severe; trafficability.	Severe; flood hazard, presumptive bearing value, and water table.	Severe; flood hazard, traffic-supporting capacity, and water table.

The soils of the Bowdre, Commerce, Lonoke, Pulaski, and Robinsonville series are in the Alluvial great soil group.

Bowdre series.—This series consists of moderately well drained, slightly acid or neutral soils that formed in 13- to 19-inch beds of clayey alluvium over coarser textured sediment that washed from the Mississippi River. The surface layer of these soils is dark-brown or very dark grayish-brown silty clay loam. The C horizon is brown to dark grayish-brown sandy clay loam, silt loam, or loamy sand; or it consists of stratified beds of silty and sandy material.

In Chicot County, Bowdre soils occur as small or medium areas around Lake Chicot and Grand Lake. They are level to gently undulating; slopes are short.

Bowdre soils are associated with Commerce, Sharkey, and Robinsonville soils. They are better drained than Sharkey soils and formed in thinner beds of clay. They are not so well drained as Robinsonville soils, but they are finer textured. Their surface layer is finer textured than that of Commerce soils.

Profile (representative of the series) of Bowdre silty clay loam, 0 to 1 percent slopes, in a moist cultivated field (SE¼SE¼ sec. 13, T. 14 S., R. 2 W.):

Ap—0 to 5 inches, dark-brown (10YR 3/3) silty clay loam; moderate, medium, angular blocky structure; plastic; few fine roots; slightly acid; abrupt, smooth boundary.

A12—5 to 13 inches, very dark grayish-brown (10YR 3/2) clay; moderate, medium, subangular blocky structure; very plastic; neutral; clear, smooth boundary.

IIC1—13 to 17 inches, brown (10YR 4/3) sandy clay loam; weak, medium, subangular blocky structure; firm; few fine pores; neutral; gradual, smooth boundary.

IIIC2—17 to 45 inches, brown (10YR 4/3) silt loam; few, fine, faint, yellowish-brown (10YR 5/6) mottles; weak, fine or medium, angular blocky structure; friable; neutral; abrupt, smooth boundary.

IVC3—45 to 68 inches, dark grayish-brown (10YR 4/2) loamy sand; structureless; loose; neutral.

Commerce series.—This series consists of moderately well drained soils that formed in medium-textured alluvium deposited by the Mississippi River. The A horizon of these soils is grayish-brown to dark grayish-brown loam that is slightly acid or neutral. The C horizon is grayish-brown to dark grayish-brown loam or silt loam that is neutral or mildly alkaline. These soils are high in natural fertility and medium in content of organic matter.

In Chicot County, Commerce soils occur in small or medium, level areas around Grand Lake and Lake Chicot. They are adjacent to Dundee, Bowdre, and Robinsonville soils. The Commerce soils are not so fine textured as the Bowdre soils, and they are not so well drained as the Robinsonville soils. They differ from Dundee soils in not having a B horizon.

Profile (representative of the series) of Commerce loam in a moist cultivated field (SW¼SW¼ sec. 33, T. 18 S., R. 1 W.):

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

C1—6 to 22 inches, grayish-brown (10YR 5/2) loam; few, fine, distinct, yellowish-brown (10YR 5/6) and brown (10YR 5/3) mottles; weak, fine or medium, subangular blocky structure; friable; fine roots and pores; neutral; diffuse boundary.

C2—22 to 55 inches, grayish-brown (10YR 5/2) silt loam (with lenses of fine sandy loam); few, fine or medium, distinct, yellowish-brown (10YR 5/4) and light-gray (10YR 7/1) mottles; weak, fine, subangular blocky structure; very friable; few worm casts; mildly alkaline.

Lonoke series.—The soils in this series are level and well drained. They formed in medium-textured sediment that washed from the Arkansas River. The A horizon of these soils is brown to dark-brown silt loam. The C horizon is brown to yellowish-red silt loam. The A horizon and the upper part of the C horizon are slightly acid or medium acid, and the lower part of the C horizon is medium acid or strongly acid. These soils are medium in natural fertility and medium in content of organic matter.

In Chicot County, Lonoke soils occur as small or medium areas along Macon Bayou and Bayou Bartholomew and are adjacent to Gallion and Hebert soils. They are better drained than Hebert soils, and they are coarser textured than both Hebert and Gallion soils.

Profile (representative of the series) of Lonoke silt loam in a moist cultivated field (NE¼NW¼ sec. 8, T. 14 S., R. 3 W.):

Ap1—0 to 7 inches, dark-brown (7.5YR 4/2) silt loam; weak, fine, granular structure; very friable; common fine pores; many fine roots; medium acid; abrupt, smooth boundary.

A12—7 to 12 inches, dark-brown (7.5YR 3/2) silt loam; moderate, medium, angular blocky structure; friable; few fine pores; few fine roots; slightly acid; clear, smooth boundary.

TABLE 10.—*Characteristics and genetic relationships of soil series*

Order, great soil group, and soil series	Slope range	Soil drainage class	Parent material	Degree of profile development
Azonal Order				
Alluvial soils:	*Percent*			
Bowdre	0 to 3	Moderately well drained	Medium-textured and fine-textured sediment over coarse-textured sediment deposited by the Mississippi River.	Weak.
Commerce	0 to 1	Moderately well drained	Chiefly medium-textured sediment deposited by the Mississippi River.	Very weak.
Lonoke	0 to 1	Well drained	Medium-textured sediment deposited by the Arkansas River.	Weak.
Pulaski	0 to 1	Well drained	Medium-textured sediment deposited by the Arkansas River.	Weak.
Robinsonville	0 to 3	Well drained	Medium-textured and coarse-textured sediment deposited by the Mississippi River.	Weak.
Intrazonal Order				
Grumusols:				
Perry	0 to 3	Poorly drained	Fine-textured sediment deposited by the Arkansas River.	Weak.
Portland	0 to 3	Somewhat poorly drained	Fine-textured sediment deposited by the Arkansas River.	Weak.
Sharkey	0 to 3	Poorly drained	Fine-textured sediment deposited by the Mississippi River.	Weak.
Low-Humic Gley soils:				
Waverly	0 to 1	Poorly drained	Medium-textured alluvium that is dominantly silty.	Weak.
Planosols:				
Calloway	0 to 3	Somewhat poorly drained	Medium-textured loess	Moderate.
Crowley	0 to 1	Poorly drained or somewhat poorly drained.	Fine-textured and medium-textured sediment deposited by the Arkansas River.	Weak.
Henry	0 to 3	Poorly drained	Medium-textured loess	Moderate.
Zonal Order				
Gray-Brown Podzolic soils:				
Dundee	0 to 3	Somewhat poorly drained	Medium-textured and fine-textured sediment deposited by the Mississippi River.	Moderate.
Gallion	0 to 3	Well drained	Medium-textured and fine-textured sediment deposited by the Arkansas River.	Moderate.
Grenada	0 to 12	Moderately well drained	Medium-textured loess	Moderate.
Hebert	0 to 1	Somewhat poorly drained	Medium-textured and fine-textured sediment deposited by the Arkansas River.	Moderate.
McGehee	0 to 3	Somewhat poorly drained	Medium-textured and fine-textured sediment deposited by the Arkansas River.	Weak.

B2—12 to 18 inches, dark-brown (7.5YR 4/2) silt loam; moderate, medium, subangular blocky structure; friable; common fine pores; slightly acid; gradual, smooth boundary.

C—18 to 57 inches, yellowish-red (5YR 5/6) silt loam; moderate, medium, subangular blocky structure; friable; common fine pores; strongly acid.

Pulaski series.—This series consists of well-drained alluvial soils on the flood plain of the Arkansas River or along former channels of the Arkansas River. These soils contain considerable material from Reddish Prairie soils. They also contain material from Red-Yellow Podzolic soils that formed in sediment derived from sandstone and shale, limestone and dolomite, or Coastal Plain material.

Pulaski soils occur typically and most extensively on the higher parts of the flood plain where overflow is occasional or rare. In Chicot County, they were mapped only with Gallion soils as an undifferentiated soil group. Gallion soils most nearly resemble Pulaski soils, but they have finer textured horizons within their profile.

Clay soils associated with Pulaski soils are the poorly drained Perry soils and the somewhat poorly drained Portland soils. Lonoke soils also occur in close association with Pulaski soils. They are brown and dark brown rather than reddish like Pulaski soils, and they have some mottles in the lower part of their profile, which is not characteristic of Pulaski soils.

Profile (representative of the series) of Pulaski fine sandy loam in a moist cultivated field (SW¼SW¼ sec. 10, T. 9 S., R. 3 W.):

Ap—0 to 7 inches, dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; very friable; many roots; slightly acid; gradual, smooth boundary.

C1—7 to 22 inches, brown (10YR 5/3) fine sandy loam; weak, fine, granular structure; very friable; many roots; slightly acid; gradual, wavy boundary.

C2—22 to 26 inches, reddish-brown (5YR 4/4) fine sandy loam; weak, fine, subangular blocky structure; friable; medium acid; gradual, smooth boundary.

C3—26 to 45 inches, yellowish-red (5YR 5/6) fine sandy loam; weak, fine, subangular blocky structure; friable; medium acid.

Robinsonville series.—This series consists of well-drained soils that formed in medium-textured and coarse-textured sediment deposited by the Mississippi River.

These soils are grayish brown to dark grayish brown and have a few yellowish-brown mottles in the lower horizons. They are slightly acid to moderately alkaline.

In Chicot County, Robinsonville soils are in medium-sized, gently undulating areas around Grand Lake and Lake Chicot. They are adjacent to Commerce and Bowdre soils. Of these, Robinsonville soils are the best drained. They are not so fine textured as Bowdre soils.

Profile (representative of the series) of Robinsonville loam, gently undulating, in a moist pasture (SW¼ SW¼ sec. 34, T. 19 S., R. 1 W.):

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) loam; weak, medium, subangular blocky structure; very friable; many fine roots; slightly acid; gradual, smooth boundary.

C1—9 to 34 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, medium, granular structure; very friable; many fine roots; mildly alkaline; diffuse boundary.

C2—34 to 48 inches, dark grayish-brown (10YR 4/2) very fine sandy loam; few, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, granular structure; very friable; few fine roots; mildly alkaline; abrupt, wavy boundary.

C3—48 to 60 inches, grayish-brown (10YR 5/2) sand; structureless; loose; numerous, sand-sized, black concretions; moderately alkaline.

Intrazonal order

The intrazonal order consists of soils that have more or less well-developed horizons. The horizons reflect the dominant influence of topography or parent material over the normal effects of climate and living organisms, especially vegetation.

The intrazonal soils in Chicot County are classified in three of the great soil groups—Grumusol, Low-Humic Gley, and Planosol.

GRUMUSOLS

This great soil group consists of intrazonal soils that are rather high in content of clay (dominantly montmorillonite). Grumusols are marked by signs of churning (internal movement) due to shrinking and swelling as the soils wet and dry. The churning tends to mix the horizons and thereby gives a youthful appearance to the soil profile. The churning also accounts for the gilgai, or hogwallow, microrelief that is characteristic of Grumusols.

The soils of the Perry, Portland, and Sharkey series are Grumusols. These soils have a prominent A1 horizont but no B horizon.

Perry series.—This series consists of poorly drained soils that formed in fine-textured sediment deposited by the Arkansas River. The A horizon of these soils is gray to dark-gray clay or silt loam. The upper part of the C horizon is gray to dark-gray clay, and the lower part is reddish-brown or dark reddish-brown clay. Perry soils are medium acid or strongly acid in the upper part of the profile and slightly acid or neutral in the lower part. They are medium in natural fertility and medium in organic-matter content.

Perry soils are in large, level to gently undulating areas in the western part of the county. They are adjacent to Hebert, Portland, and Sharkey soils. Perry soils are less brown than Portland soils and less gray in the lower part of the profile than Sharkey soils. They are grayer than Hebert soils and have a higher content of clay.

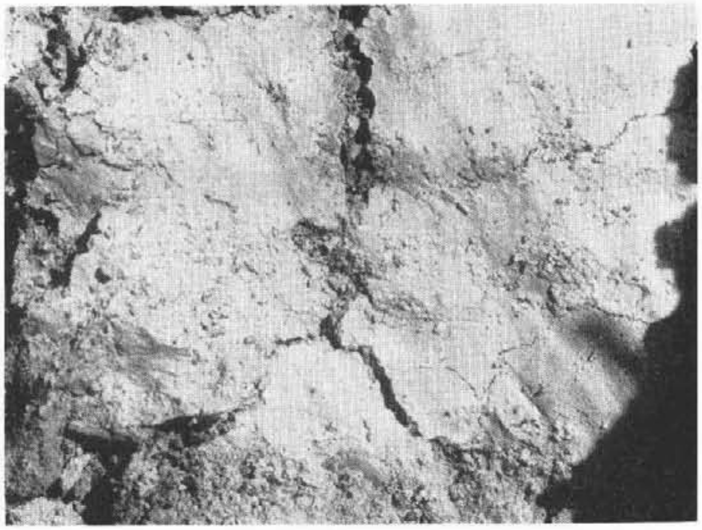

Figure 9.—**A close-up view of slickensides in the lower part of a profile of Perry clay.**

Profile (representative of the series) of Perry clay, 0 to 1 percent slopes, (fig. 9) in a moist wooded area (SW¼NE¼ sec. 35, T. 13 S., R. 3 W.):

O1—½ inch to 0, partially decomposed leaves and plant residue.

A1—0 to 5 inches, dark-gray (10YR 4/1) clay; moderate, medium, angular blocky structure; very firm; many fine or medium roots; strongly acid; clear, smooth boundary.

AC—5 to 10 inches, dark-gray (10YR 4/1) clay; many, medium, prominent, yellowish-brown (10YR 5/6) mottles; moderate, medium, angular blocky structure; very firm; common, medium or coarse roots; strongly acid; clear, smooth boundary.

C1g—10 to 19 inches, gray (10YR 5/1) clay; many, medium, prominent, strong-brown (7.5YR 5/6) mottles; moderate, medium, angular blocky structure; very firm; common slickensides; few large roots; strongly acid; clear, wavy boundary.

C2g—19 to 25 inches, mottled gray (10YR 5/1) and reddish-brown (5YR 4/4) clay; strong, coarse, angular blocky structure; very firm; many slickensides; strongly acid; clear, wavy boundary.

C3—25 to 42 inches, reddish-brown (5YR 4/4) clay; moderate, medium, angular blocky structure; very firm; many calcium carbonate concretions; slightly acid.

Portland series.—This series consists of somewhat poorly drained soils that formed in fine-textured sediment deposited by the Arkansas River. The A horizon of these soils is grayish-brown to dark grayish-brown clay. The C horizon is reddish-brown clay. Portland soils are slightly acid or medium acid in the upper horizons and neutral or mildly alkaline in the lower horizons. They are medium to high in natural fertility and medium in organic-matter content.

Portland soils are in medium-sized, level to gently undulating areas in the western part of the county. They are adjacent to Hebert, McGehee, and Perry soils. Portland soils are browner than Perry soils, and they are finer textured than Hebert and McGehee soils.

Profile (representative of the series) of Portland clay, 0 to 1 percent slopes, in a moist cultivated field (SW¼ NW¼ sec. 19, T. 16 S., R. 3 W.):

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) clay; weak, medium, subangular blocky structure; very firm; very plastic; many roots; few, fine, black concretions; medium acid; clear, smooth boundary.

AC—4 to 17 inches, reddish-brown (5YR 4/3) clay; common to many, prominent, medium, light brownish-gray (10YR 6/2) and strong-brown (7.5YR 5/6) mottles; moderate, medium, angular blocky structure; many slickensides; very firm when moist, very plastic when wet; few, soft, dark-colored concretions; medium acid; gradual, wavy boundary.

C—17 to 72 inches, reddish-brown (5YR 4/3) clay; weak to moderate, medium, angular blocky structure; very firm when moist, plastic when wet; many slickensides; scattered concretions of calcium carbonate; mildly alkaline.

Sharkey series.—This series consists of poorly drained soils that formed in fine-textured sediment deposited by the Mississippi River. The A horizon of these soils is gray to very dark grayish-brown clay that is slightly acid or medium acid. The C horizon is gray to dark-gray clay that is slightly acid to mildly alkaline. The fertility is high, and the organic-matter content is medium.

Sharkey soils are level to gently undulating and occur in large areas in the eastern part of the county. They are adjacent to Bowdre and Perry soils. Sharkey soils are not so well drained as Bowdre soils, and they have a finer textured C horizon. They are grayer in the lower part of the C horizon than Perry soils.

Profile (representative of the series) of Sharkey clay, 0 to 1 percent slopes, in moist cultivated field (NE¼SW¼ sec. 35, T. 16 S., R. 2 W.):

Ap—0 to 4 inches, very dark grayish-brown (10YR 3/2) clay; moderate, medium, subangular blocky structure; firm when dry, very plastic when wet; few, fine, black concretions; medium acid; clear, smooth boundary.

Cg—4 to 48 inches, dark-gray (10YR 4/1) clay; common, fine or medium, distinct, yellowish-brown (10YR 5/4) mottles; few, fine, dendritic passageways of gray; moderate, medium, angular blocky structure; firm when dry, very plastic when wet; many well-formed slickensides; few, fine, black concretions; slightly acid (upper part) to mildly alkaline (at a depth of about 48 inches).

LOW-HUMIC GLEY SOILS

This great soil group consists of intrazonal soils that developed under poor drainage. Gleization has dominated the other processes of soil formation. Thus, Low-Humic Gley soils have strongly gleyed horizons that show little difference in texture. They have a thin surface horizon that is medium in content of organic matter.

In Chicot County, Waverly soils are representative of the Low-Humic Gley great soil group. They have a light-gray A1 horizon. In most places, the underlying horizons are predominantly gray, strongly gleyed, and little different in texture. But in some places there is strong contrast in texture between the layers. The contrast, however, is due to the original stratification of the alluvial parent materials rather than to the soil-forming processes.

Waverly series.—This series consists of poorly drained, strongly acid or very strongly acid soils that developed from medium-textured alluvium that is dominantly silty. These soils have an A horizon of light brownish-gray silt loam and a C horizon of light-gray to gray silt loam to silty clay loam. They are low in fertility and low in content of organic matter.

Waverly soils are in small or medium, depressed or level areas on Macon Ridge in the southern part of the county. They are frequently flooded.

Adjacent to Waverly soils are Calloway and Henry soils. Waverly soils lack a fragipan, which is a layer characteristic of Henry and Calloway soils. They are grayer and more poorly drained than Calloway soils.

Profile (representative of the series) of Waverly silt loam in a moist wooded area (NW¼NW¼ sec. 32, T. 19 S., R. 2 W.):

O1—½ inch to 0, partly decomposed plant remains.

A1—0 to 6 inches, light brownish-gray (10YR 6/2) silt loam; few, fine, faint, brown (10YR 5/3) and gray (10YR 6/1) mottles; weak, fine or medium, subangular blocky structure; friable; few fine roots and pores; few, soft to hard, dark-colored concretions; very strongly acid; gradual, smooth boundary.

C1g—6 to 30 inches, gray (10YR 6/1) silt loam; few, fine, faint, yellowish-brown (10YR 5/6) mottles; weak, medium, angular blocky structure; friable; many, fine, soft to hard, dark-colored concretions; many fine pores; very strongly acid; diffuse boundary.

C2g—30 to 59 inches, gray (10YR 6/1) silt loam; common, medium, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; friable; many, fine, soft to hard, dark-colored concretions, a few of which are one-fourth inch in diameter; very strongly acid.

PLANOSOLS

This great soil group consists of intrazonal soils that developed in a humid climate in nearly level or gently sloping areas. Planosols have an eluviated surface horizon that is underlain by a fragipan. In most places the fragipan is at a depth of 13 to 24 inches.

Planosols in Chicot County are the soils of the Calloway, Crowley, and Henry series.

Calloway series.—This series consists of somewhat poorly drained soils that developed in thick deposits of loess. The A horizon of these soils is dark grayish-brown to brown silt loam. The B horizon also is silt loam but is pale brown or grayish brown mottled with yellowish brown and light brownish gray. These soils have a fragipan at a depth of 14 to 24 inches. This layer is light brownish gray mottled with yellowish brown and gray.

Calloway soils are strongly acid or very strongly acid. They are low in natural fertility and low in content of organic matter.

In Chicot County, Calloway soils occur as small or medium areas throughout Macon Ridge in the south-central part of the county. They are level or nearly level; their slope range is 0 to 3 percent.

Adjacent to Calloway soils are Grenada and Henry soils. Calloway soils are intermediate in drainage, color, and relief between Grenada and Henry soils. They have a more strongly developed fragipan than Grenada soils, and their subsoil is more pale and is more mottled in the upper part. Calloway soils are less gray than Henry soils.

Profile (representative of the series) of Calloway silt loam, 0 to 1 percent slopes, in a moist pasture (NE¼NE¼ sec. 36, T. 19 S., R. 3 W.):

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; few, fine, faint, light brownish-gray (10YR 6/2) and dark-gray (10YR 4/1) mottles; weak, medium, subangular blocky structure; friable; many, fine, soft, dark-colored concretions; very strongly acid; clear, wavy boundary.

B2—8 to 15 inches, pale-brown (10YR 6/3) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) and light brownish-gray (10YR 6/2) mottles; weak, medium, subangular blocky structure; friable; many fine pores; few, soft, dark-colored concretions; strongly acid; gradual, wavy boundary.

A'2x—15 to 21 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) and gray (10YR 6/1) mottles; weak, fine, angular blocky structure; compact and brittle; few patchy clay films in cavities; many pores; common, medium, black concretions; strongly acid; clear, wavy boundary.

B'21tx—21 to 29 inches, gray (10YR 6/1) silty clay loam; common, fine or medium, prominent, strong-brown (7.5YR 5/8) mottles; weak, medium or coarse, subangular blocky structure; compact and brittle; few pores; common, soft, dark-colored concretions; strongly acid; clear, wavy boundary.

B'22tx—29 to 72 inches, variegated dark-brown (7.5YR 4/4), light yellowish-brown (10YR 6/4), and gray (10YR 6/1) heavy silt loam; massive; very compact and brittle; common fine pores; few, fine, black concretions; very strongly acid.

Crowley series.—This series consists of poorly drained or somwehat poorly drained soils that developed from fine-textured and medium-textured sediment deposited by the Arkansas River. The A horizon of these soils is dark-gray to grayish-brown silt loam. The B horizon is brownish-gray to gray silty clay or clay, mottled with reddish brown or red. The C horizon is light brownish-gray clay, or it consists of stratified sandy and clayey material.

Crowley soils are medium acid or strongly acid and may be slightly acid in the lowermost part. Their content of organic matter is low.

In Chicot County, Crowley soils are in small level spots surrounded by Hebert silt loam. Crowley soils are not so well drained as Hebert soils, but they differ from Hebert soils chiefly in having a more clayey B horizon.

Profile (representative of the series) of Crowley silt loam in a cultivated field (SW¼NW¼ sec. 26, T. 13 S., R. 3 W.):

Ap—0 to 6 inches, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; very friable; few, fine, hard, black concretions; strongly acid; clear, smooth boundary.

A12—6 to 16 inches, grayish-brown (10YR 5/2) silt loam; common, fine and medium, yellowish-brown (10YR 5/8) mottles; weak, fine, subangular blocky structure; friable; few, fine, hard, black concretions; strongly acid; clear, smooth boundary.

B1—16 to 22 inches, light brownish-gray (10YR 6/2) light silty clay loam; common, medium, brown (10YR 5/3) mottles and few, fine, dark-brown (10YR 3/3) mottles; weak, fine or medium, subangular blocky structure; friable; strongly acid; clear, smooth boundary.

B2t—22 to 36 inches, light brownish-gray (10YR 6/2) silty clay; common, medium, distinct, dark reddish-brown (2.5YR 3/4) mottles; moderate, medium, subangular blocky structure; firm; strongly acid; clear, smooth boundary.

C—36 to 42 inches, thinly stratified, brown (10YR 5/3) sandy loam and light brownish-gray (10YR 6/2) clay; medium acid.

Henry series.—This series consists of poorly drained soils that developed in thick loess. These soils have an A horizon of dark-gray to light-gray silt loam. Their B horizon is light-gray to gray silt loam to silty clay loam that is mottled with strong brown, yellowish red, and yellowish brown. This horizon is a fragipan, and it is at a depth of 10 to 30 inches. Henry soils are strongly acid to extremely acid. Their content of organic matter is low.

Henry soils are in small to medium, depressed or level areas on Macon Ridge in the southern part of the county. Adjacent soils are the Calloway and Grenada soils. Henry soils are grayer and not so well drained as Grenada and Calloway soils.

Profile (representative of the series) of Henry silt loam in a moist wooded area (NW¼NW¼ sec. 11, T. 19 S., R. 2 W.):

O1—½ inch to 0, partially decomposed leaves and plant residue.

A1—0 to 4 inches, dark-gray (N 4/0) silt loam; weak, medium, subangular blocky structure; friable; few, fine, black concretions; common roots; extremely acid; clear, smooth boundary.

A2—4 to 13 inches, light-gray (10YR 6/1) silt loam; common, medium, distinct, brown (7.5YR 5/4) mottles; weak, fine or medium, subangular blocky structure; friable; common, fine to medium, black concretions; common fine pores; very strongly acid; gradual, wavy boundary.

B1tx—13 to 29 inches, light-gray (10YR 6/1) silt loam; common, medium, prominent, brown (7.5YR 5/4) and yellowish-red (5YR 4/8) mottles; massive; firm and brittle; common, hard, black concretions (up to 1½ inches in diameter); few patchy clay films; many pores lined with clay; very strongly acid; diffuse boundary.

B2tx—29 to 42 inches, light brownish-gray (10YR 6/2) silty clay loam; common, medium to coarse, prominent, brown (7.5YR 5/4) mottles; massive; compact and brittle; soft and hard black concretions (up to 2 inches in diameter); numerous pores lined with clay; very strongly acid; clear, wavy boundary.

B3x—42 to 72 inches, gray (10YR 6/1) silt loam; many, medium to coarse, distinct, yellowish-brown (10YR 5/6) and dark-brown (10YR 4/3 and 7.5YR 4/2) mottles; massive; very hard, very compact, and brittle; many, hard, black concretions; very strongly acid.

Zonal order

The zonal order consists of soils having well-developed characteristics that reflect the influence of the active factors of soil formation—climate and living organisms, chiefly vegetation.

The zonal soils in Chicot County are classified in the Gray-Brown Podzolic great soil group.

GRAY-BROWN PODZOLIC SOILS

This great soil group consists of zonal soils that developed in a warm, moist, humid climate under deciduous forest. Podzolization is the main process in the development of these soils. Gray-Brown Podzolic soils, if undisturbed, have a thin organic cover over a thin organic-mineral horizon that, in turn, is over a leached horizon. Below the leached horizon is an illuviated horizon.

In Chicot County, the soils of the Dundee, Gallion, Grenada, Hebert, and McGehee series are in the Gray-Brown Podzolic great soil group. These soils are slightly leached or moderately leached. They have a grayish-brown to brown A1 horizon that has granular structure, a grayish-brown to brown A2 horizon, and a yellowish-brown to brown, moderately fine textured B horizon that has blocky structure. Grenada soils have a brittle fragipan.

Dundee series.—This series consists of somewhat poorly drained soils that formed in thinly stratified beds of loamy and clayey alluvium deposited by the Mississippi River.

The A horizon of these soils is dark grayish-brown or grayish-brown silt loam. The B horizon is dark-gray to dark grayish-brown silty clay loam that is mottled dark yellowish brown and yellowish brown.

Dundee soils are in small to medium, level to gently undulating areas east and west of Lake Chicot and along Connerly Bayou and Yellow Bayou north of Lake Chicot. Adjacent soils are the Robinsonville and Commerce. Dundee soils have a B horizon and Robinsonville and Commerce do not. Dundee soils range from strongly acid or medium acid in the A horizon to neutral in the C horizon; Robinsonville and Commerce soils range from slightly acid or neutral in the A horizon to mildly alkaline or moderately alkaline in the C horizon. Dundee soils have dark yellowish-brown mottles throughout the B and C horizons; Robinsonville soils are not mottled, and Commerce soils have yellowish-brown mottles at a depth of more than 6 inches.

Profile (representative of the series) of Dundee silt loam, 0 to 1 percent slopes, in a moist cultivated field (NE¼SE¼ sec. 35, T. 16 S., R. 1 W.):

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure (platy structure in lower part); friable; few, fine, soft, black concretions; few roots; strongly acid; clear, smooth boundary.

A12—6 to 13 inches, dark grayish-brown (10YR 4/2) loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, medium, angular blocky structure; friable; common fine pores; soft dark-colored concretions; medium acid; abrupt, wavy boundary.

B2t—13 to 20 inches, dark grayish-brown (10YR 4/2) silty clay loam; common, fine, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, medium, subangular blocky structure; firm when moist, sticky when wet; patchy clay films; few fine pores; few, soft, dark-brown concretions; slightly acid; clear, smooth boundary.

C1—20 to 49 inches, grayish-brown (10YR 5/2) silt loam; many, fine, distinct, dark yellowish-brown (10YR 4/4) mottles that get coarser with depth; weak, medium, subangular blocky structure; friable; many fine pores; neutral; gradual, wavy boundary.

IIC2—49 to 72 inches, dark-gray (10YR 4/1) silty clay; common, distinct, dark-brown (7.5YR 4/4) mottles; massive; very firm when moist, plastic when wet; neutral.

Gallion series.—This series consists of well-drained soils that developed from fine-textured and medium-textured sediments deposited by the Arkansas River. The A horizon of these soils is dark-brown to brown silt loam. The B horizon is yellowish-red to reddish-brown silt loam or silty clay loam. The C horizon is brown to light-brown silt loam. These soils are very strongly acid or strongly acid.

In Chicot County, Gallion soils are in small, level and nearly level areas chiefly along Bayou Bartholomew, Macon Bayou, Big Bayou, and tributaries of Lafourche Bayou. Adjacent to Gallion soils are Hebert, Lonoke, Perry, and Portland soils. Gallion soils are better drained than Hebert soils, finer textured than Lonoke soils, and coarser textured than Perry and Portland soils.

Profile (representative of the series) of Gallion silt loam, 0 to 1 percent slopes, in a moist cultivated field (SW¼SE¼ sec. 17, T. 15 S., R. 2 W.):

Ap—0 to 8 inches, dark-brown (10YR 4/3) silt loam; weak, medium, granular structure (almost platy structure in lower part) very friable; few, fine, soft concretions; few pores and fine roots; strongly acid; gradual, smooth boundary.

A2—8 to 19 inches, brown (10YR 5/3) silt loam; few to common, fine, distinct, strong-brown (7.5YR 5/8) mottles; weak, medium, angular blocky structure; friable; few, fine, dark-brown concretions; fine pores; strongly acid; gradual, wavy boundary.

B1—19 to 26 inches, reddish-brown (5YR 5/4) silt loam; yellowish-brown coatings on peds and in cracks; moderate, medium, subangular blocky structure; friable; few pores; very strongly acid; gradual, wavy boundary.

B2t—26 to 39 inches, yellowish-red (5YR 4/8) silt loam; moderate, medium, subangular blocky structure; friable or firm; patchy clay skins; few fine pores; very strongly acid; gradual, wavy boundary.

C—39 to 72 inches, light-brown (7.5YR 6/4) silt loam; common, coarse, distinct, reddish-brown (5YR 5/4) and pale-brown (10YR 6/3) mottles; massive; very friable; strongly acid.

Grenada series.—This series consists of moderately well drained soils that developed in thick loess. These soils have an A horizon of dark-brown to brown silt loam. Their B horizon is brown to yellowish-brown silt loam to light silty clay loam. A mottled light yellowish-brown, dark yellowish-brown, and gray fragipan is at a depth of 20 to 28 inches. Grenada soils are strongly acid or very strongly acid. They are low in fertility and low in content of organic matter.

Grenada soils are in medium-sized areas on Macon Ridge in the southern part of the county. The slope range is 0 to 12 percent. Adjacent soils are the Calloway and the Henry. Grenada soils are better drained and browner than the somewhat poorly drained Calloway soils and the poorly drained Henry soils.

Profile (representative of the series) of Grenada silt loam, 1 to 3 percent slopes, in a moist wooded area (NE¼NE¼ sec. 27, T. 18 S., R. 2 W.):

O1—½ inch to 0, partly decomposed plant remains.

A1—0 to 3 inches, dark-brown (7.5YR 3/2) silt loam; weak, fine, granular structure; friable; few, fine, hard, dark-colored concretions; many fine roots; very strongly acid; clear, smooth boundary.

A2—3 to 10 inches, brown (7.5YR 4/4) silt loam; weak, fine, granular structure; friable; few, fine, hard, dark-colored concretions; few fine pores; many fine roots; strongly acid; gradual, smooth boundary.

B21t—10 to 25 inches, brown (7.5YR 4/4) light silty clay loam; moderate, medium, blocky structure; friable; patchy clay films; few fine pores; dark-colored concretions and roots; very strongly acid; gradual, smooth boundary.

B22tx—25 to 41 inches, light yellowish-brown (10YR 6/4) silt loam; many, medium to coarse, distinct, dark yellowish-brown (10YR 4/4) and gray (10YR 6/1) mottles; massive; compact and brittle; common spherical cavities ¼ to ½ inch in diameter, lined with clay films; common, soft, black concretions; few fine pores; very strongly acid; gradual, wavy boundary.

B23tx—41 to 58 inches, light brownish-gray (10YR 6/2) light silty clay loam; common, fine to medium, prominent, yellowish-brown (10YR 5/8) and dark-brown (7.5YR 4/4) mottles; massive; compact and brittle; many fine pores lined with clay; common, soft, black concretions; very strongly acid; gradual, irregular boundary.

C—58 to 72 inches, brown (7.5YR 5/4) silt loam; many, medium, distinct, yellowish-brown (10YR 5/8) mottles; gray coatings on peds; massive; firm; very strongly acid.

Hebert series.—This series consists of somewhat poorly drained soils that developed from fine-textured and medium-textured sediment deposited by the Arkansas River. The A horizon of these soils is brown to grayish-brown silt loam. The B horizon is grayish-brown silty clay loam to silty clay mottled with strong brown, yellowish brown, grayish brown, or brown. The C horizon is grayish-brown silt loam or fine sandy loam mottled with reddish brown. Hebert soils are slightly acid to strongly acid. Their organic-matter content is low.

Hebert soils are in small level areas along Macon Bayou, Bayou Bartholomew, Big Bayou, and tributaries of Lafourche Bayou. Adjacent to Hebert soils are Gallion, Lonoke, McGehee, Perry, and Portland soils. Hebert soils are not so well drained as Gallion and Lonoke soils, and they have a coarser textured C horizon than McGehee, Perry, and Portland soils.

Profile (representative of the series) of Hebert silt loam in a cultivated field (NE¼SW¼ sec. 6, T. 14 S., R. 3 W.):

Ap—0 to 6 inches, grayish-brown (10YR 5/2) silt loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine, granular structure; very friable; slightly acid; clear, smooth boundary.

A12—6 to 16 inches, grayish-brown (10YR 5/2) silt loam; many, medium, prominent, yellowish-brown (10YR 5/6) mottles; weak, medium, granular structure; friable; medium acid; gradual, wavy boundary.

B2t—16 to 31 inches, grayish-brown (10YR 5/2) silty clay loam; many, large, prominent, strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; medium acid; gradual, wavy boundary.

C—31 to 45 inches, grayish-brown (10YR 5/2) fine sandy loam; many, large, prominent, reddish-brown (5YR 5/4) mottles; weak, fine, granular structure; friable; strongly acid.

McGehee series.—This series consists of somewhat poorly drained soils that developed from medium-textured and fine-textured sediment deposited by the Arkansas River. These soils have an A horizon of dark-brown, pale-brown, or brown silt loam and a C horizon of reddish-brown silty clay. They are medium acid to very strongly acid. They are moderately fertile and contain a moderate amount of organic matter.

These soils are in small to medium, level to gently undulating areas in the north-central part of the county. They are adjacent to Hebert and Portland soils. McGehee soils are finer textured in the lower part of the profile than Hebert soils. They are coarser textured in the upper part (A horizon) than Portland soils and are more acid.

Profile (representative of the series) of McGehee silt loam, 0 to 1 percent slopes, in a moist cultivated field (NW¼NW¼ sec. 36, T. 13 S., R. 3 W.):

Ap—0 to 6 inches, dark-brown (10YR 4/3) silt loam; few, fine, pale-brown (10YR 6/3) and yellowish-red (5YR 5/6) mottles; weak, fine, granular structure; very friable; few roots; common, fine, black concretions; very strongly acid; clear, smooth boundary.

A21—6 to 14 inches, pale-brown (10YR 6/3) silt loam; common, medium, grayish-brown (10YR 5/2) mottles and few, medium, reddish-brown (5YR 5/4) mottles; friable concretions; weak, fine, granular and subangular blocky structure; common pores; few roots; very strongly acid; clear, smooth boundary.

A22—14 to 19 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, yellowish-brown and strong-brown mottles on sliced surfaces of soft concretion-like material; discrete aggregates of silty clay loam that have mottled grayish-brown and reddish-brown interiors; very friable soil mass; common medium pores; pores of the fine-textured aggregates appear to be lined with clay; strongly acid; wavy, abrupt boundary with tongues that extend as much as 6 inches into the underlying horizon.

Bt—19 to 26 inches, reddish-brown (5YR 4/4) light silty clay loam; few, medium, grayish-brown mottles; silty clay aggregates with reddish interiors and moderate, medium, subangular blocky structure; grayish-brown interstitial silt loam or light silty clay loam; firm when moist, somewhat sticky and plastic when wet; common medium pores; few, medium, hard, black concretions that have reddish-brown interiors; pores of clayey aggregates appear to be lined with clay; few patchy clay films; strongly acid; gradual, wavy boundary.

IIC—26 to 42 inches, reddish-brown (5YR 4/3) silty clay; few, medium, grayish-brown mottles; moderate, medium, subangular blocky structure; hard when dry, very firm when moist, sticky and plastic when wet; common medium pores; few, medium, hard, dark-colored concretions; strongly acid; silty, gradual boundary.

A1b—42 to 53 inches, very dark gray (5YR 3/1) clay; near massive but, under lens, soil material appears as fine and medium pellets thinly coated with reddish brown; hard when dry, firm when moist, very sticky and plastic when wet; very strongly acid; clear, wavy boundary.

Mechanical and Chemical Analyses

Mechanical and chemical data resulting from laboratory analyses can be useful to the soil scientist in classifying the soils. These data are helpful in estimating available moisture capacity, acidity, base-exchange capacity, mineralogical composition, organic-matter content, and other soil characteristics that affect management needs. The data are also helpful in developing concepts of soil formation. More recently, laboratory data have proved helpful in rating soils for nonagricultural uses, that is, for residential, industrial, recreational, or transportational use.

Several factors are involved in selecting soils for laboratory analyses. Soils that are extensive and most important in the survey area are considered first. A review of available laboratory data is made to determine the need for additional information on these particular soils. Generally, priority is given to soils for which little or no laboratory data are available.

In Chicot County, soils representing 15 soil series were selected for analyses. The analyses were made by the University of Arkansas in Fayetteville. Tables 11 and 12 show the results.

Particle-size distribution was determined by the hydrometer method (*3*). The cation exchange capacity was calculated by summation of extractable cations. Extractable calcium, potassium, and sodium were determined by using a flame spectrophotometer. Extractable magnesium was determined colorimetrically. A buffer solution of barium chloride titrated with hydrochloric acid was used to determine extractable hydrogen. The percentages of organic matter were estimated, using the potassium dichromate-sulfuric acid digestion method. Soil reaction was determined with a Beckman pH meter.

TABLE 11.—*Mechanical analyses of selected soils*

[Analyses made by the University of Arkansas, Fayetteville, Ark.; dashes in place of an entry indicate that analysis was not made or data resulting from the analysis were insignificant]

Soil and sample number	Depth	Horizon	Particle-size distribution: Very coarse sand (2.0 mm. to 1.0 mm.)	Coarse sand (1.0 mm. to 0.5 mm.)	Medium sand (0.5 mm. to 0.25 mm.)	Fine sand (0.25 mm. to 0.10 mm.)	Very fine sand (0.10 mm. to 0.05 mm.)	Total sand	Silt (0.05 mm. to 0.002 mm.)	Clay (less than 0.002 mm.)	USDA textural class
Bowdre silty clay loam:	*In.*		*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	
S-62-Ark.-9-19-(1)	0 to 5	Ap	0.16	0.11	0.30	1.51	11.50	13.58	50.1	36.3	Silty clay loam.
S-62-Ark.-9-19-(2)	5 to 13	A12	.03	.05	.30	1.09	4.28	5.75	39.6	54.6	Clay.
S-62-Ark.-9-19-(3)	13 to 17	IIC1	.03	.21	1.20	2.74	40.44	44.62	29.3	26.1	Silty clay loam.
S-62-Ark.-9-19-(4)	17 to 45	IIIC2	.03	.33	2.50	6.00	19.06	27.92	60.6	11.5	Silt loam.
S-62-Ark.-9-19-(5)	45 to 68	IVC3	.03	.53	6.56	31.20	45.20	83.52	12.7	3.8	Loamy sand.
Calloway silt loam:											
S-62-Ark.-9-11-(1)	0 to 8	Ap	.52	1.14	.47	.91	1.55	4.60	80.0	15.4	Silt loam.
S-62-Ark.-9-11-(2)	8 to 15	B2	.05	.43	.33	.15	1.25	2.20	73.5	24.3	Silt loam.
S-62-Ark.-9-11-(3)	15 to 21	A'2x	.35	1.31	.56	.61	1.24	4.10	80.8	15.1	Silt loam.
S-62-Ark.-9-11-(4)	21 to 29	B'21tx	.10	.95	.63	.76	.98	3.40	62.6	34.0	Silty clay loam.
S-62-Ark.-9-11-(5)	29 to 72	B'22tx	.03	.22	.22	.43	1.10	2.00	71.1	26.9	Silt loam.
Commerce loam:											
S-62-Ark.-9-16-(1)	0 to 6	Ap	.08	.26	.23	2.02	29.44	32.04	54.4	13.6	Silt loam.
S-62-Ark.-9-16-(2)	6 to 22	C1	.03	.26	.38	1.79	40.28	42.74	47.6	9.7	Loam.
S-62-Ark.-9-16-(3)	22 to 56	C2	.05	.18	.10	.38	30.45	31.16	60.8	8.0	Silt loam.
Commerce silty clay loam:											
S-62-Ark.-9-17-(1)	0 to 6	Ap	.05	.08	.16	.96	5.79	7.04	63.5	29.5	Silty clay loam.
Dundee silt loam:											
S-62-Ark.-9-5-(1)	0 to 6	Ap	.03	.05	.08	2.10	26.67	28.90	53.1	18.0	Silt loam.
S-62-Ark.-9-5-(2)	6 to 13	A12	----	.03	.10	.76	40.05	40.90	42.5	16.6	Loam.
S-62-Ark.-9-5-(3)	13 to 20	B2t	----	.05	.03	.10	4.90	5.10	64.8	30.1	Silty clay loam.
S-62-Ark.-9-5-(4)	20 to 49	C1	----	.03	.05	.23	28.27	28.60	54.6	16.8	Silt loam.
S-62-Ark.-9-5-(5)	49 to 72	IIC2	.03	.05	.05	.32	1.13	1.60	47.8	50.6	Silty clay.
Gallion silt loam:											
S-62-Ark.-9-23-(1)	0 to 8	Ap1	.03	.26	.26	3.80	34.35	38.70	55.3	6.0	Silt loam.
S-62-Ark.-9-23-(2)	8 to 13	Ap2	.03	.16	.16	1.46	30.47	32.27	59.4	8.3	Silt loam.
S-62-Ark.-9-23-(3)	13 to 17	A3	.03	.15	.10	.69	6.53	7.51	84.2	8.3	Silt.
S-62-Ark.-9-23-(4)	17 to 32	B2t	----	.08	.13	.19	12.50	12.90	57.0	30.1	Silty clay loam.
S-62-Ark.-9-23-(5)	32 to 60	C	.03	.18	.13	3.62	28.19	32.16	53.6	14.2	Silt loam.
Gallion silt loam:											
S-62-Ark.-9-4-(1)	0 to 8	Ap	.25	.58	.58	1.87	14.60	17.90	69.5	12.6	Silt loam.
S-62-Ark.-9-4-(2)	8 to 19	A2	.05	.05	.05	.38	14.26	14.80	73.9	11.3	Silt loam.
S-62-Ark.-9-4-(3)	19 to 26	B1	----	.03	.05	.08	13.40	13.60	66.1	20.3	Silt loam.
S-62-Ark.-9-4-(4)	26 to 39	B2t	----	.03	.03	.05	5.83	5.90	67.2	26.9	Silt loam.
S-62-Ark.-9-4-(5)	39 to 72	C	----	----	.03	.03	13.80	13.90	78.5	7.6	Silt loam.
Grenada silt loam:											
S-62-Ark.-9-10-(1)	0 to 3	A1	.03	.42	.52	.68	1.05	2.70	83.1	14.2	Silt loam.
S-62-Ark.-9-10-(2)	3 to 10	A2	.05	.28	.32	.57	1.37	2.80	81.8	15.4	Silt loam.
S-62-Ark.-9-10-(3)	10 to 25	B21t	.03	.03	.10	.18	.68	1.00	75.2	23.8	Silt loam.
S-62-Ark.-9-10-(4)	25 to 41	B22tx	----	.10	.18	.45	1.51	2.20	79.1	18.7	Silt loam.
S-62-Ark.-9-10-(5)	41 to 58	B23tx	.05	.28	.28	.33	1.22	2.20	69.9	27.9	Silty clay loam.
Grenada silt loam:											
S-62-Ark.-9-20-(1)	0 to 5	Ap1	.08	.18	.13	.38	.03	.79	86.5	12.7	Silt loam.
S-62-Ark.-9-20-(2)	5 to 10	A2	.15	.20	.18	.23	2.09	2.85	80.6	16.5	Silt loam.
S-62-Ark.-9-20-(3)	10 to 18	B21t	.03	.03	.03	.05	.03	.16	68.4	31.4	Silty clay loam.
S-62-Ark.-9-20-(4)	18 tc 30	B22tx	.03	.13	.21	.29	.99	1.65	73.5	24.8	Silt loam.
S-62-Ark.-9-20-(5)	30 to 50	B23tx	.03	.21	.21	.29	.42	1.15	79.4	19.4	Silt loam.

TABLE 11.—*Mechanical analyses of selected soils*—Continued

Soil and sample number	Depth	Horizon	Particle-size distribution: Very coarse sand (2.0 mm. to 1.0 mm.)	Coarse sand (1.0 mm. to 0.5 mm.)	Medium sand (0.5 mm. to 0.25 mm.)	Fine sand (0.25 mm. to 0.10 mm.)	Very fine sand (0.10 mm. to 0.05 mm.)	Total sand	Silt (0.05 mm. to 0.002 mm.)	Clay (less than 0.002 mm.)	USDA textural class
	In.		*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	
Hebert silt loam:											
S-62-Ark.-9-1-(1)	0 to 4	Ap1	0.38	1.45	.79	2.11	17.66	22.40	64.9	12.7	Silt loam.
S-62-Ark.-9-1-(2)	4 to 8	A12	.69	1.73	.79	1.71	17.37	22.30	63.7	14.0	Silt loam.
S-62-Ark.-9-1-(3)	8 to 16	B1	.16	.82	.42	.69	8.38	10.50	61.5	28.0	Silty clay loam.
S-62-Ark.-9-1-(4)	16 to 27	B2t	.05	.27	.16	.35	6.70	7.50	45.8	46.7	Silty clay loam.
S-62-Ark.-9-1-(5)	27 to 39	B3	----	.05	.05	.23	11.45	11.80	59.5	28.7	Silty clay loam.
S-62-Ark.-9-1-(6)	39 to 51	C1	.03	.10	.08	.34	13.78	14.30	61.9	23.8	Silt loam.
S-62-Ark.-9-1-(7)	51 to 72	C2	----	.03	.03	1.62	70.44	72.10	21.5	6.4	Sandy loam.
Henry silt loam:											
S-62-Ark.-9-9-(1)	0 to 4	A1	.53	.53	.26	.47	1.58	3.40	84.7	11.9	Silt loam.
S-62-Ark.-9-9-(2)	4 to 13	A2	1.19	.79	.33	.51	1.32	4.10	80.7	15.2	Silt loam.
S-62-Ark.-9-9-(3)	13 to 29	B1tx	1.57	1.52	.63	.73	1.28	5.70	69.3	25.0	Silt loam.
S-62-Ark.-9-9-(4)	29 to 42	B2tx	1.10	1.25	.50	.76	1.57	5.20	65.9	28.9	Silty clay loam.
S-62-Ark.-9-9-(5)	42 to 72	B3x	.23	.78	.52	.94	1.95	4.40	69.5	26.1	Silt loam.
Lonoke silt loam:											
S-62-Ark.-9-26-(1)	0 to 7	Ap1	.05	.26	.26	1.29	19.04	20.91	72.6	6.5	Silt loam.
S-62-Ark.-9-26-(2)	7 to 12	A12	.05	.16	.11	.32	3.53	4.16	82.3	13.5	Silt loam.
S-62-Ark.-9-26-(3)	12 to 18	B2	.03	.03	.05	.16	9.00	9.27	67.5	23.2	Silt loam.
S-62-Ark.-9-26-(4)	18 to 57	C	----	----	.03	.13	.16	.32	86.7	13.0	Silt loam.
Perry clay:											
S-62-Ark.-9-12-(1)	0 to 5	A1	.06	.23	.17	.23	2.56	3.23	31.8	65.0	Clay.
S-62-Ark.-9-12-(2)	5 to 10	AC	----	.11	.11	.39	.06	.67	27.7	71.6	Clay.
S-62-Ark.-9-12-(3)	10 to 19	C1g	----	.23	.12	.35	1.50	2.19	27.3	70.5	Clay.
S-62-Ark.-9-12-(4)	19 to 25	C2g	.11	.28	.17	.39	0	.95	24.6	74.4	Clay.
S-62-Ark.-9-12-(5)	25 to 42	C3	1.16	1.10	.64	.76	.93	4.59	21.0	74.4	Clay.
Perry silt loam, overwash:											
S-62-Ark.-9-25-(1)	0 to 6	Ap	.11	.27	.24	2.28	.11	3.00	86.6	10.4	Silt.
Portland clay:											
S-62-Ark.-9-7-(1)	0 to 4	Ap	.10	.44	.26	.26	.29	31.40	34.8	63.8	Clay.
S-62-Ark.-9-7-(2)	4 to 17	AC	.03	.19	.21	.24	.35	1.00	17.5	81.5	Clay.
S-62-Ark.-9-7-(3)	17 to 72	C	.71	.81	.60	.89	.73	3.70	16.3	80.0	Clay.
McGehee silt loam:											
S-63-Ark.-9-1-(1)	0 to 6	Ap	.21	.43	11.02	.54	10.28	22.50	72.2	5.3	Silt loam.
S-63-Ark.-9-1-(2)	6 to 14	A21	.03	.18	.10	.15	7.78	8.20	79.1	12.7	Silt loam.
S-63-Ark.-9-1-(3)	14 to 19	A22	.03	.13	.08	.08	8.08	8.40	81.8	9.8	Silt.
S-63-Ark.-9-1-(4)	19 to 26	Bt	----	.08	.08	.16	2.05	2.40	74.2	23.4	Silt loam.
S-63-Ark.-9-1-(5)	26 to 42	IIC	.05	.10	2.71	.23	.75	3.90	63.6	32.5	Silty clay loam.
S-63-Ark.-9-1-(6)	42 to 53	A'b	----	.08	.16	.59	5.38	6.20	52.8	41.0	Silty clay.
Robinsonville loam:											
S-62-Ark.-9-21-(1)	0 to 9	Ap	----	.10	.64	5.68	42.45	48.87	37.5	13.6	Loam.
S-62-Ark.-9-21-(2)	9 to 34	C1	.03	.15	.25	45.61	17.53	63.57	28.9	7.5	Fine sandy loam.
S-62-Ark.-9-21-(3)	34 to 48	C2	.03	.25	.25	4.66	50.74	55.94	36.7	7.4	Very fine sandy loam.
S-62-Ark.-9-21-(4)	48 to 60	C3	----	3.53	48.27	40.35	5.26	97.40	2.6	0	Sand.
Sharkey clay:											
S-62-Ark.-9-8-(1)	0 to 4	Ap	.03	.16	.16	.40	1.13	1.90	38.3	59.8	Clay.
S-62-Ark.-9-8-(2)	4 to 48	C	.03	.16	.16	.32	.78	1.50	32.8	65.7	Clay.
Waverly silt loam:											
S-62-Ark.-9-18-(1)	0 to 6	A1	.03	.03	.03	.15	.46	.69	86.5	12.8	Silt loam.
S-62-Ark.-9-18-(2)	6 to 30	C1g	.13	.28	.23	.33	2.66	3.63	83.7	12.7	Silt loam.
S-62-Ark.-9-18-(3)	30 to 59	C2g	.19	.43	.27	.51	.21	1.60	71.9	26.5	Silt loam.

TABLE 12.—*Chemical analyses of selected soils*

[Analyses made by the University of Arkansas, Fayetteville, Ark.]

Soil and sample number	Depth	Horizon	Extractable cations (milliequivalents per 100 grams of soil)						Base saturation	Reaction	Organic matter	Available P_2O_5
			K	Ca	Mg	Na	H	Total				
	In.								*Pct.*	*pH*	*Pct.*	*Lbs./acre*
Bowdre silty clay loam:												
S-62-Ark.-9-19-(1)	0 to 5	Ap	0.55	13.25	4.17	0.10	4.13	22.20	81.4	6.1	1.80	115
S-62-Ark.-9-19-(2)	5 to 13	A12	.65	21.38	5.20	.43	5.92	33.58	82.4	6.6	1.00	25
S-62-Ark.-9-19-(3)	13 to 17	IIC1	.26	9.50	1.63	.15	3.00	14.54	79.4	6.7	.40	54
S-62-Ark.-9-19-(4)	17 to 45	IIIC2	.19	6.25	.73	.08	1.63	8.88	81.6	6.5	.20	57
S-62-Ark.-9-19-(5)	45 to 68	IVC3	.11	3.75	.31	.05	.70	4.92	85.8	6.7	.10	39
Calloway silt loam:												
S-62-Ark.-9-11-(1)	0 to 8	Ap	.22	3.00	.94	.10	9.16	13.42	31.7	4.6	.40	54
S-62-Ark.-9-11-(2)	8 to 15	B2	.13	2.50	.94	.37	9.52	13.46	29.3	5.3	.10	39
S-62-Ark.-9-11-(3)	15 to 21	A12x	.10	1.88	.94	.33	7.04	10.29	31.6	5.3	.10	14
S-62-Ark.-9-11-(4)	21 to 29	B121tx	.22	3.00	5.21	1.09	12.49	22.01	43.3	5.1	.06	3
S-62-Ark.-9-11-(5)	29 to 72	B122tx	.10	3.75	5.21	1.52	10.32	20.90	50.6	4.7	.04	80
Commerce loam:												
S-62-Ark.-9-16-(1)	0 to 6	Ap	.41	6.75	2.08	.03	1.15	10.42	89.0	6.3	.90	62
S-62-Ark.-9-16-(2)	6 to 22	C1	.12	9.50	2.08	.05	.44	12.19	96.4	7.1	.30	12
S-62-Ark.-9-16-(3)	22 to 56	C2	.14	11.00	2.60	.07	.49	14.30	96.6	7.6	.46	14
Commerce silty clay loam:												
S-62-Ark.-9-11-(1)	0 to 6	Ap	.56	11.50	3.65	.08	4.38	20.17	78.3	6.6	1.20	133
Dundee silt loam:												
S-62-Ark.-9-5-(1)	0 to 6	Ap	.41	8.45	2.29	.04	3.33	14.52	77.1	5.5	.60	75
S-62-Ark.-9-5-(2)	6 to 13	A12	.23	8.45	1.98	.05	2.66	13.37	80.1	6.0	.70	23
S-62-Ark.-9-5-(3)	13 to 20	B2t	.38	13.00	1.98	.10	3.32	18.78	82.3	6.4	.40	14
S-62-Ark.-9-5-(4)	20 to 49	C1	.21	8.25	1.98	.09	1.91	12.44	84.6	6.9	.64	18
S-62-Ark.-9-5-(5)	49 to 72	IIC2	.65	18.56	9.38	.16	3.42	32.17	89.4	7.0	.10	66
Gallion silt loam:												
S-62-Ark.-9-23-(1)	0 to 8	Ap1	.38	2.25	.42	.02	3.85	6.92	44.4	6.0	1.40	288
S-62-Ark.-9-23-(2)	8 to 13	Ap2	.20	2.75	.32	.03	7.56	10.86	30.4	4.6	1.50	204
S-62-Ark.-9-23-(3)	13 to 17	A3	.09	1.75	.21	.03	3.76	5.84	35.6	4.8	.20	178
S-62-Ark.-9-23-(4)	17 to 32	B2t	.33	2.00	.42	.24	13.58	16.57	18.0	4.6	.20	198
S-62-Ark.-9-23-(5)	32 to 60	C	.13	1.50	.42	.26	3.96	6.27	36.8	5.2	0	118
Gallion silt loam:												
S-62-Ark.-9-4-(1)	0 to 8	Ap	.15	4.50	2.00	.11	4.30	11.06	61.1	5.1	.20	105
S-62-Ark.-9-4-(2)	8 to 19	A2	.10	3.25	.83	.05	4.07	8.30	51.0	5.2	.10	222
S-62-Ark.-9-4-(3)	19 to 26	B1	.21	3.00	2.08	.09	8.21	13.59	39.6	4.8	.20	280
S-62-Ark.-9-4-(4)	26 to 39	B2t	.33	2.38	2.60	.19	12.45	17.95	30.6	4.7	.10	222
S-62-Ark.-9-4-(5)	39 to 72	C	.12	3.13	3.13	.13	3.16	9.67	67.3	5.2	.10	52
Grenada silt loam:												
S-62-Ark.-9-10-(1)	0 to 3	A1	.40	4.00	1.56	.03	12.33	18.32	32.7	4.9	3.14	125
S-62-Ark.-9-10-(2)	3 to 10	A2	.38	3.75	1.04	.03	7.96	13.16	39.5	5.5	1.65	84
S-62-Ark.-9-10-(3)	10 to 25	B21t	.30	1.75	1.04	.03	9.40	12.52	24.9	4.7	.20	188
S-62-Ark.-9-10-(4)	25 to 41	B22tx	.18	1.50	1.04	.12	9.83	12.67	22.4	4.8	.20	52
S-62-Ark.-9-10-(5)	41 to 58	B23tx	.28	2.25	6.25	1.07	12.71	22.56	43.7	4.7	1.60	25
Grenada silt loam:												
S-62-Ark.-9-20-(1)	0 to 5	Ap	.18	2.00	.42	.10	1.52	4.22	63.9	5.6	1.10	43
S-62-Ark.-9-20-(2)	5 to 10	A2	.10	1.75	.52	.24	5.88	8.49	30.7	5.5	.70	27
S-62-Ark.-9-20-(3)	10 to 18	B21t	.22	2.25	.52	.39	11.89	15.27	22.1	5.2	.20	37
S-62-Ark.-9-20-(4)	18 to 30	B22tx	.16	1.50	.63	.37	10.40	13.06	20.4	5.6	.10	43
S-62-Ark.-9-20-(5)	30 to 50	B23tx	.22	1.50	.63	.67	9.21	12.23	24.7	5.8	0	21
Hebert silt loam:												
S-62-Ark.-9-1-(1)	0 to 4	Ap1	.37	4.50	1.98	.03	8.10	14.98	45.9	5.1	1.36	43
S-62-Ark.-9-1-(2)	4 to 8	Ap12	.17	4.75	2.08	.05	8.14	15.19	46.4	5.3	1.30	23
S-62-Ark.-9-1-(3)	8 to 16	B1	.14	4.63	3.13	.09	10.76	18.75	42.6	5.0	.36	50
S-62-Ark.-9-1-(4)	16 to 27	B2t	.42	4.75	6.67	.36	17.77	29.97	40.7	4.7	.30	21
S-62-Ark.-9-1-(5)	27 to 39	B3	.26	3.75	6.67	.75	7.72	19.15	59.7	5.2	.20	18
S-62-Ark.-9-1-(6)	39 to 51	C1	.21	4.50	6.67	1.02	5.65	18.05	68.7	5.2	.10	32
S-62-Ark.-9-1-(7)	51 to 72	C2	.09	3.00	2.08	.54	1.09	6.80	83.9	5.9	.10	66

Table 12.—*Chemical analyses of selected soils*—Continued

Soil and sample number	Depth	Horizon	Extractable cations (milliequivalents per 100 grams of soil)						Base saturation	Reaction	Organic matter	Available P_2O_5
			K	Ca	Mg	Na	H	Total				
	In.								Pct.	pH	Pct.	Lbs./acre
Henry silt loam:												
S-62-Ark.-9-9-(1)	0 to 4	A1	0.28	3.75	0.94	0.04	12.04	17.05	29.4	4.3	3.00	244
S-62-Ark.-9-9-(2)	4 to 13	A2	.18	3.63	1.04	.05	6.70	11.60	42.2	4.8	.20	118
S-62-Ark.-9-9-(3)	13 to 29	B1tx	.18	4.25	3.13	.23	9.92	17.71	43.9	4.8	.30	100
S-62-Ark.-9-9-(4)	29 to 42	B2tx	.24	5.25	1.67	1.22	9.52	17.90	46.8	4.8	.20	115
S-62-Ark.-9-9-(5)	42 to 72	B3x	.20	5.50	4.69	2.07	8.18	20.64	60.4	4.5	.60	86
Lonoke silt loam:												
S-62-Ark.-9-26-(1)	0 to 7	Ap1	.43	4.25	.52	.03	2.77	8.00	65.4	5.8	1.30	272
S-62-Ark.-9-26-(2)	7 to 12	A12	.85	5.25	.63	.05	3.46	10.24	66.2	6.4	.90	288
S-62-Ark.-9-26-(3)	12 to 18	B2	1.27	6.00	.73	.09	3.69	11.78	68.7	6.4	.80	178
S-62-Ark.-9-26-(4)	18 to 57	C	.83	2.75	.32	.11	5.68	9.69	41.4	5.4	.20	168
Perry clay:												
S-62-Ark.-9-12-(1)	0 to 5	A1	.77	16.00	1.04	.32	18.03	34.16	53.1	5.3	1.80	21
S-62-Ark.-9-12-(2)	5 to 10	AC	.71	15.50	16.67	.79	17.72	51.39	65.5	5.4	1.20	21
S-62-Ark.-9-12-(3)	10 to 19	C1g	.68	16.00	16.67	1.54	14.79	49.68	70.2	5.2	.94	18
S-62-Ark.-9-12-(4)	19 to 25	C2g	.76	18.00	16.67	2.00	11.90	49.33	75.8	5.3	.74	21
S-62-Ark.-9-12-(5)	25 to 42	C3	.72	24.50	20.83	5.04	.62	51.71	100	6.3	.46	18
Perry silt loam, overwash:												
S-62-Ark.-9-15-(1)	0 to 6	Ap	.16	2.75	.73	.07	6.48	10.19	36.4	4.9	1.76	91
Portland clay:												
S-62-Ark.-9-7-(1)	0 to 4	Ap	.85	15.87	8.33	.16	9.35	34.56	72.9	6.0	3.24	100
S-62-Ark.-9-7-(2)	4 to 17	AC	.73	13.63	20.83	1.34	11.74	48.27	75.7	5.7	.20	32
S-62-Ark.-9-7-(3)	17 to 72	C	.76	13.55	22.91	5.38	.22	42.82	100	7.5	.70	12
McGehee silt loam:												
S-63-Ark.-9-1-(1)	0 to 6	Ap	.10	1.56	.52	.05	4.02	6.25	35.68	4.9	1.30	46
S-63-Ark.-9-1-(2)	6 to 14	A21	.10	1.81	1.04	.12	5.43	8.50	36.12	5.0	.40	82
S-63-Ark.-9-1-(3)	14 to 19	A22	.10	1.25	1.25	.29	5.51	8.40	34.40	5.2	.20	59
S-63-Ark.-9-1-(4)	19 to 26	Bt	.31	2.88	3.65	.93	8.85	16.62	46.75	5.1	.20	64
S-63-Ark.-9-1-(5)	26 to 42	IIC	.44	4.96	5.73	1.36	8.46	20.95	59.75	5.3	.30	88
S-63-Ark.-9-1-(6)	42 to 53	A'b	.46	6.50	6.25	1.83	10.27	25.31	59.42	4.9	.90	54
Robinsonville loam:												
S-62-Ark.-9-21-(1)	0 to 9	Ap	.24	6.25	.52	.04	.84	7.89	89.4	6.3	.80	16
S-62-Ark.-9-21-(2)	9 to 34	C1	.15	6.25	.63	.04	.54	7.61	92.9	7.4	.30	12
S-62-Ark.-9-21-(3)	34 to 48	C2	.11	7.00	.42	.04	.58	7.61	92.4	7.7	.20	12
S-62-Ark.-9-21-(4)	48 to 60	C3	.04	1.50	.32	.01	.42	2.29	81.7	7.9	0	12
Sharkey clay:												
S-62-Ark.-9-8-(1)	0 to 4	Ap	.87	18.75	7.29	.10	10.27	37.28	72.5	5.9	3.00	102
S-62-Ark.-9-8-(2)	4 to 48	C	.62	21.13	9.38	.54	5.91	37.58	84.3	6.4	.84	57
Waverly silt loam:												
S-62-Ark.-9-18-(1)	0 to 6	A1	.15	1.13	.63	.05	8.81	10.77	18.2	4.6	1.60	100
S-62-Ark.-9-18-(2)	6 to 30	C1g	.06	.88	.52	.07	8.31	9.84	15.5	4.7	.30	30
S-62-Ark.-9-18-(3)	30 to 59	C2g	.17	2.63	3.13	1.26	13.64	20.83	34.5	4.7	.10	71

General Nature of the County

This section tells some of the history of Chicot County and gives information about its population, physiography, and water supply. Also discussed are agricultural trends, transportation, industry, and climate.

History and Population

The area that is now Chicot County came under the jurisdiction of the United States in 1803 as part of the Louisiana Purchase. It was a part of the Missouri Territory until July 4, 1819, when it became a part of the Arkansas Territory.

Chicot County was established on October 25, 1823, when Arkansas was still a territory. Statehood for Arkansas came in 1836. Chicot County was carved out of Arkansas County and was named for Point Chicot. The first county seat was the old town of Columbia, which was washed away by the Mississippi River. In 1855 the county seat was located at Chicot, in Mason Township, but about 2 years later it was moved to Lake Village, the present county seat.

When the county was established, it had no schools or improved dirt roads. Boats on the Mississippi River provided most of the transportation. Several river landings served the county when the steamboat era was at its peak.

Chicot County has a population of 18,990. The larger towns in the county and their population are: Dermott, 3,665; Eudora, 3,598; and Lake Village, 2,998.

Physiography

The soils on the bottom lands in Chicot County are a part of the flood plain of the Arkansas and Mississippi Rivers. In these areas, oxbow lakes, swamps, and many meanders remain as evidence of previous large stream channels. The soils on the uplands are a part of the southern Mississippi Valley silty uplands. These soils are on Macon Ridge, which extends in a nearly straight line from Eudora, in this county, to Sicily Island, in Louisiana (*4*). The soils on the uplands are mostly silty and are of loessal origin.

Most of the county is level and nearly level. The bottom lands are level to gently undulating. Macon Ridge ranges from level to sloping. At the east side of Macon Ridge, there is a distinct break between the loessal soils of the uplands and the alluvial soils of the bottom lands.

The elevation drops about half a foot per 100 feet, from the sandy ridgetops along the bayous to the heavy clay bottoms, and gradually levels off. In the northern part of the county, the elevation averages 135 to 140 feet above mean gulf level. It decreases southward to about 100 to 105 feet above mean gulf level. On Macon Ridge, the highest point is about 145 feet and the lowest about 115 feet.

Water Supply

Chicot County has an abundant supply of water in its many lakes and streams. The Mississippi River is the largest stream, and Lake Chicot, with a surface area of 5,072 acres, is the largest natural lake. This lake is the largest in the State.

Most of the water for domestic use comes from driven wells. Water-bearing materials occur in the substrata throughout most of the county. Furthermore, the water table is rarely more than 20 feet below the surface. Dermott, Eudora, and Lake Village have a public water system that obtains its water from wells.

Quaternary-age deposits are the only source of ground water for irrigation (*5*). These, however, provide water in ample amounts. In a few small areas, ground water contains too many minerals to be suitable for irrigation. Reports indicate that all irrigation wells in the county yield in excess of 1,000 gallons per minute. Three wells in the southeastern part are reported to yield 5,000 to 6,000 gallons per minute. The maximum depth of an irrigation well in the county is 150 feet.

Agricultural Trends

About 68 percent of Chicot County is farmland, according to the 1959 Census of Agriculture. Census figures also show that, in the past few years, farms in this county have steadily increased in size but have decreased in number. Farms numbered 2,425 in 1949, 1,855 in 1954, and 937 in 1959. The average-sized farm was 113 acres in 1949, 153 acres in 1954, and 302 acres in 1959.

About 562 farms in this county are less than 50 acres in size, about 110 are between 50 and 90 acres, about 156 are between 100 and 499 acres, about 33 are between 500 and 990 acres, and about 13 are 1,000 acres or more.

Soybeans, cotton, rice, and hay are the crops most commonly grown in the county. The soybean acreage has increased from 2,031 acres in 1949 to 8,114 acres in 1954 and to 34,741 acres in 1959. It is still increasing, for soybeans fit in well with rice and cotton and lend themselves to specialization.

The acreage in rice and cotton has decreased because of acreage allotments. Rice occupied 16,465 acres in 1954, but only 9,505 in 1959. Cotton was planted on 60,677 acres in 1949, on 38,818 acres in 1954, and on 28,577 acres in 1959.

The acreage in pasture has increased since 1949, probably because the number of cattle has increased. About 20,150 acres were pastured in 1949, about 33,851 acres in 1954, and about 46,917 acres in 1959.

Transportation and Industry

Three U.S. highways and six State highways serve the county. All main lateral roads running into these highways are gravel. The Missouri Pacific Railroad first entered Chicot County in 1878. This railroad now has one major trunk line and three branch lines serving this area.

The Mississippi River is one of the principal means of transporting freight to and from the county. Shipping tonnage on the Mississippi River today greatly exceeds that of the steamboat era and is increasing each year.

Industries in the county include cotton gins, rice-drying plants, plants for lumber and wood products, food-processing plants, and garment factories.

Climate [6]

The climate in Chicot County is characterized by warm summers, mild winters, and ample rainfall (table 13). Such a climate is favorable for a wide variety of crops and other vegetation. The growing season in the county averages 225 days. The average annual temperature is 64° F.

Temperatures during June, July, and August average about 80° F. Warm and humid weather, however, can be expected from May through September. During this period, the temperature will rise to 90° on at least 85 days, and a temperature of 100° is not uncommon.

Temperatures in winter generally are above freezing; the average winter temperature is in the upper 40's. A subzero temperature is rare. The record lows range from 10° to −3°.

Records at the U.S. Weather Station in Portland, Ashley County, Ark., show that, on the average, a temperature of 32° F. can occur as early as November 5 and as late as March 16. The earliest that a temperature of 32° has occurred, according to records, is October 6 (in 1932), and the latest is April 13 (in 1940). A temperature of 28° F. can occur as early as November 21 and as late as March 2. The earliest that a temperature of 28° has occurred is November 3 (in 1954), and the latest is March 26 (in 1940).

Chicot County is near a large source of moisture, the Gulf of Mexico, and most every winter is the southern-

[6] By R. O. Rheinhold, meteorologist, U.S. Weather Bureau, Little Rock, Ark.

TABLE 13.—*Temperature and precipitation*

[Data are for 1921 through 1962 and are based on records of the U.S. Weather Station at Portland, Ashley County, Ark.]

Month	Temperature				Precipitation		
	Average daily maximum	Average daily minimum	2 years in 10 will have at least 4 days with—		Average monthly total	1 year in 10 will have—	
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—
	° F.	° F.	° F.	° F.	Inches	Inches	Inches
January	56	36	79	12	5.75	2.40	12.05
February	59	38	80	12	4.95	2.35	8.05
March	66	44	86	24	5.50	3.45	8.80
April	74	54	89	34	4.99	1.85	8.05
May	82	62	94	44	3.92	1.25	7.40
June	89	69	99	55	3.39	.35	6.70
July	90	73	101	62	4.02	1.60	7.65
August	92	70	103	58	2.69	.62	5.00
September	86	63	97	47	2.89	.93	6.00
October	78	52	92	31	2.83	.80	6.50
November	67	41	85	21	4.41	1.80	8.50
December	58	37	80	17	4.93	1.65	7.75

most point reached by polar and arctic air masses. Consequently, active frontal precipitation is common, and slightly more than 50 inches of rainfall, on the average, can be expected in this county every year. About 50 percent of the annual precipitation occurs during winter and the early part of spring—December through April. January, which gets rainfall most regularly, is the wettest month. Nearly 6 inches of rainfall can be expected every January. Record-breaking monthly totals of 15 to 17 inches, however, occur mostly late in summer.

Dry spells and droughts are likely to occur in summer when monthly totals are lowest and, in some years (1 year in 10), fall well below 1 inch.

Precipitation in the form of snow is not common. A measurable amount of snow will occur only in 3 to 5 years out of 10. In an extreme year, 8 to 10 inches will fall. Nevertheless, because of active winter fronts, frost and freezing precipitation do occur, though infrequently, and generally are hazardous to plants.

Of 512 tornadoes that occurred in Arkansas from 1916 through 1961, 35 swept through Chicot County. Tornadoes occur most frequently between March and June.

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Glossary

Acidity. See Reaction, soil.

Aggregate, soil. Many fine particles held in a single mass or cluster, such as a clod, crumb, block, or prism.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited by streams.

Available moisture 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 o tension.

Board foot. The amount of wood in a board 1 foot wide, 1 foot long, and 1 inch thick; 144 cubic inches; 1/12 of a cubic foot.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diamter. 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.

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, will 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.

Crop rotation. A systematic changing of crops grown on the same land to help prevent soil exhaustion. A cropping plan.

Cropland. Areas used regularly for crops, except forest crops. Cropland includes fields in rotation pasture or summer fallow, as well as fields that are temporarily idle.

Doyle rule. A rule for determining the number of board feet in a log.

Drainage, soil. The rapidity and extent of the removal of water from the soil by runoff and flow through the soil to underground spaces.

Eluviation. The movement of material from one place to another within the soil, in either true solution or colloidal suspension. Soil horizons that have lost material through eluviation are said to be eluvial; those that have received material are illuvial.

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

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants when other growth factors such as light, moisture, temperature, and the physical condition (or tilth) of the soil are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational water, 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.*

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic matter and clay but is rich in silt or very fine sand. The layer is seemingly cemented when dry, has a hard or very hard consistence, and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. A fragipan is a few inches to several feet thick and generally occurs below the B horizon, 15 to 40 inches below the surface.

Gilgai. Microrelief of clays that have a high coefficient of expansion and contraction with changes in moisture, usually a succession of microbasins and microknolls, in nearly level areas, or of microvalleys and microridges that run with the slope.

Gleyed soil. A soil in which saturation and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes.

Illuviation. The accumulation of material in a soil horizon through the deposition of suspended material and organic matter removed from horizons above. Since part of the fine clay in the B horizon (or subsoil) of many soils has moved into the B horizon from the A horizon above, the B horizon is called an illuvial horizon.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers, and by the height of the water table, either permanent or perched. Relative terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Leaching. The removal of soluble materials from soils or other material by percolating water.

Loam. Soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Loess. A fine-grained eolian deposit consisting dominantly of silt-sized particles.

Montmorillonite. A fine, platy, alumino-silicate clay mineral that expands and contracts with the absorption and loss of water. It has a high cation-exchange capacity and is plastic and sticky when moist.

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.

Natural drainage. Refers to the conditions 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 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 horizon and in the upper part of the B horizon and have mottling in the lower part of the B horizon and in the C horizon.

Imperfectly or somewhat poorly drained soils are wet for significant periods but not all the time; podzolic soils in this drainage class commonly are mottled, at a depth below 6 to 16 inches, in the lower part of the 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.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients include nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Organic matter. A general term for plant and animal material, in or on the soil, in all stages of decomposition. Readily decomposed organic matter is often distinguished from the more stable forms that are past the stage of rapid decomposition.

Parent material (soil). The horizon of weathered rock or partly weathered material from which soil has formed; horizon C in the soil profile.

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

Percolation. The downward movement of water through the soil.

Permeability, soil. 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.*

pH. A term used to indicate the acidity and alkalinity of soils. (See Reaction.)

Plowpan. A compacted layer formed in the soil immediately below the plowed layer.

Poorly graded soil. A soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles in poorly graded soil material, density can be increased only slightly by compaction.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline.

An acid, or "sour," soil is one that gives an acid reaction, an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

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

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

Reticulate mottling. A type of mottling distinguished by a network of differently colored streaks; most frequently occurs in the deeper parts of latosolic soils.

Row direction. Plowing rows in a direction to obtain maximum benefit from the natural gradient to drain excess water from a field. Practiced, either alone or in conjunction with a designed drainage system, on fields with slopes of less than 1 percent.

Runoff. The rate at which water is removed by flow over the surface of the soil. The rapidity of runoff and the amount of water removed is closely related to slope and is also affected by factors such as texture, structure, and porosity of the surface soil; the vegetative covering; and the prevailing climate. Relative degrees of runoff are as follows:

Ponded.—None of the water added to the soil as precipitation or by flow from surrounding higher areas escapes as runoff. Removal is by movement through the soil or by evaporation.

Very slow.—Surface water flows away so slowly that free water lies on the surface for long periods or enters immediately into the soil. Very little of the water is removed by runoff.

Slow.—Surface water flows away so slowly that free water covers the soil for significant periods or enters the soil so rapidly that only a small amount is removed as runoff. Normally, there is little or no erosion hazard.

Medium.—Surface water flows away at such a rate that a moderate proportion of the water enters the soil profile, and free water lies on the surface for only short periods. The loss of water over the surface does not reduce seriously the supply available for plant growth. This commonly is considered good external drainage. The erosion hazard may be slight to moderate if soil of this class is cultivated.

Rapid.—A large part of the precipitation moves rapidly over the surface of the soil and a small part moves through the soil profile. The erosion hazard commonly is moderate to high.

Very rapid.—A very large part of the water moves rapidly over the surface of the soil and a very small part goes through the profile. The erosion hazard is commonly high or very high.

Sand. A soil separate ranging from 2.0 millimeters to 0.05 millimeter in diameter. As a textural class, soil material that contains 85 percent or more sand, and a percentage of silt that, added to 1½ times the percentage of clay, does not exceed 15.

Sandy loam. Soil material that contains 20 percent or less clay, 52 percent or more sand, and a percentage of silt that, added to twice the percentage of clay, exceeds 30; or soil material that contains less than 7 percent clay, less than 50 percent silt, and between 43 and 52 percent sand.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Silt loam. Soil material that contains 50 percent or more silt and 12 to 27 percent clay; or soil material that contains 50 to 80 percent silt and less than 12 percent clay.

Silty clay. Soil material that contains 40 percent or more clay and 40 percent or more silt.

Silty clay loam. Soil material that contains 27 to 40 percent clay and less than 20 percent sand.

Slack-water areas. Bottom lands where clay sediments have settled out of suspension.

Slope classes. As used in this report, they are as follows:

	Percent of slope
Level	0 to 1
Nearly level	1 to 3
Gently sloping	3 to 8
Sloping	8 to 12
Gently undulating	Steepest slope is 3 percent.

Soil. The natural medium for the growth of land plants. It is characterized by layers resulting from modification of the parent material by physical, chemical, and biological forces 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 millimeters); 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.

Stratified. Composed of or arranged in strata, or layers, for example, stratified alluvium. The term is confined to geological material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the profile below plow depth.

Substratum. Any layer lying beneath the solum, or true soil; the C or D horizon.

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.

Traffic pan. Subsurface layer (in soil) so compacted by the application of weight (machines, tractors, etc.) that the penetration of water and roots is interfered with.

Water table. The highest part of the soil or underlying rock material that is saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Well-graded soil. A soil or soil material consisting of particles that are well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Woodland. Land bearing a stand of trees of any age or size, including seedlings, of species that average at least 6 feet tall at maturity; or land from which such a stand has been removed, but which has been put to no other use.

Workability. The ease with which tillage, harvesting, and other farming operations can be accomplished.

GUIDE TO MAPPING UNITS

[See table 1, p. 5, for approximate acreage and proportional extent of soils; table 2, p. 22, for estimated average acre yields of crops; table 6, p. 30, table 7, p. 32, and table 8, p. 36, for information significant to soil engineering; and table 9, p. 40, for information pertaining to nonagricultural uses of soils]

Map symbol	Mapping unit	Page	Capability unit		Woodland group [1]		Wildlife group	
			Symbol	Page	Number	Page	Number	Page
BoA	Bowdre silty clay loam, 0 to 1 percent slopes	5	IIw-1	17			2	24
BoU	Bowdre silty clay loam, gently undulating	5	IIIw-5	21			2	24
CaA	Calloway silt loam, 0 to 1 percent slopes	6	IIw-2	18	2	27	5	26
CaB	Calloway silt loam, 1 to 3 percent slopes	6	IIw-2	18	2	27	5	26
CGB	Calloway-Grenada silt loams, 0 to 3 percent slopes.	6	IIw-2	18	2	27	5	26
CHA	Calloway-Henry silt loams, 0 to 2 percent slopes.	6	(2)		2	27	5	26
Cm	Commerce silty clay loam	6	IIw-1	17			2	24
Co	Commerce loam	6	I-1	16			2	24
DnA	Dundee silt loam, 0 to 1 percent slopes	7	IIw-3	18			2	24
DnU	Dundee silt loam, gently undulating	7	IIIw-4	20			2	24
GaB	Gallion fine sandy loam, 1 to 3 percent slopes	8	IIe-1	17			4	25
GnA	Gallion silt loam, 0 to 1 percent slopes	8	I-1	16			3	24
GnB	Gallion silt loam, 1 to 3 percent slopes	8	IIe-1	17			4	25
GPA	Gallion and Pulaski fine sandy loams, 0 to 1 percent slopes.	8	I-1	16			3	24
GrA	Grenada silt loam, 0 to 1 percent slopes	8	IIw-2	18	1	27	5	26
GrB	Grenada silt loam, 1 to 3 percent slopes	9	IIe-2	17	1	27	5	26
GrB2	Grenada silt loam, 1 to 3 percent slopes, eroded	9	IIe-2	17	1	27	5	26
GrC	Grenada silt loam, 3 to 8 percent slopes	9	IIIe-1	18	1	27	5	26
GrC2	Grenada silt loam, 3 to 8 percent slopes, eroded	9	IIIe-1	18	1	27	5	26
GrD2	Grenada silt loam, 8 to 12 percent slopes, eroded.	9	IVe-1	21	1	27	6	26
Gu	Gullied land	9	VIIe-1	21			6	26
HC	Hebert and Crowley silt loams	10	IIw-3	18			4	25
He	Henry silt loam	10	IIIw-3	20	2	27	5	26
Lo	Lonoke silt loam	10	I-1	16			3	24
McA	McGehee silt loam, 0 to 1 percent slopes	11	IIw-3	18			4	25
McU	McGehee silt loam, gently undulating	11	IIIw-4	20			4	25
Mu	Mixed alluvial land	11	Vw-1	21	3	27	7	26
PeA	Perry clay, 0 to 1 percent slopes	11	IIIw-1	19	3	27	1	24
PeU	Perry clay, gently undulating	11	IIIw-2	19	3	27	1	24
Pr	Perry silt loam, overwash	12	IIIw-1	19	3	27	1	24
PtA	Portland clay, 0 to 1 percent slopes	12	IIIw-1	19	3	27	1	24
PtU	Portland clay, gently undulating	12	IIIw-2	19	3	27	1	24
RoU	Robinsonville loam, gently undulating	13	IIe-1	17			2	24
ShA	Sharkey clay, 1 to 3 percent slopes	13	IIIw-1	19	3	27	1	24
ShU	Sharkey clay, gently undulating	13	IIIw-2	19	3	27	1	24
Wa	Waverly silt loam	14	Vw-1	21	3	27	5	26

[1] Only those soils likely to remain wooded were placed in woodland suitability groups.
[2] Calloway silt loam is in capability unit IIw-2 (p. 18), and Henry silt loam is in capability unit IIIw-3 (p. 20).