Series 1954, No. 4 Issued September, 1959

SOIL SURVEY

Humphreys County Mississippi

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

HOW TO USE THE SOIL SURVEY REPORT

THIS SURVEY of Humphreys County will help you plan the kind of farming that will protect your soils and provide good yields. It describes the soils; shows their locations on a map; and tells what they will do under different kinds of management.

Find your farm on the map

In using this survey, start with the index to map sheets in the back of this report. This is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. The sheets of the large map, if laid together, make a large photograph of the county. Woods, fields, roads, rivers, and many other landmarks can be seen on this map. Remember, however, that the aerial photographs were made in 1944–45. Woodlands may have been cleared since then, or fields rearranged.

When you have found the map sheet for your farm, notice that boundaries of the soils have been outlined and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they appear on the map.

Suppose there is an area on your farm marked with the symbol Ac. The name of the soil this symbol represents can be learned by looking at the map legend. The symbol Ac identifies Alligator clay, nearly level phase.

Learn about the soils on your farm

Alligator clay, nearly level phase, and all the other soils mapped are described in the section, Descriptions of Soils. Soil scientists walked over the fields and through the woodlands. They dug holes and examined surface soils and subsoils; measured slopes with a hand level; noted differences in growth of crops, weeds, brush, or trees; and, in fact, recorded all the things about the soils that they believed might affect their suitability for farming. They drew lines on the aerial photographs to show the boundaries of the soils.

After they mapped and studied the soils, the scientists consulted farmers and others who work with farmers, and then they placed the soils in capability units. A capability unit is a group of soils that need and respond to about the same kind of management and that require similar protection from erosion.

For example, Alligator clay, nearly level phase, is in capability unit 8 (IIIs–4). Turn to the section, Capability Grouping of Soils, and read what is said about soils of unit 8 (IIIs–4). Study the table that tells you how much you can expect to harvest from each soil under two levels of management. In columns A are yields to be expected under prevailing management; in columns B are yields to be expected under improved management.

Make a farm plan

For the soils on your farm, compare your yields and farm practices with those given in this report. Look at your fields for signs of runoff, erosion, and poor drainage. Then decide whether or not you need to change your methods. The choice, of course, must be yours. This survey will aid you in planning new methods, but it is not a plan of management for your farm or any other farm in the county.

If you find that you need help in farm planning, consult the local representative of the Soil Conservation Service or the county agricultural agent. Members of the staff of your State agricultural experiment station and others familiar with farming in your county will also be glad to help you.

Fieldwork for this survey was completed in 1954. Unless otherwise specifically indicated, all statements in this report refer to conditions in Humphreys County at that time.

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Series 1954, No. 4

Issued September, 1959

SOIL SURVEY OF HUMPHREYS COUNTY, MISSISSIPPI

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

General Nature of the Area

Humphreys County, the most recently organized county in Mississippi, is in the west-central part of the State in the flood plain area of the Mississippi River. This county, one of the five smallest counties in the State, is used principally for farming. Cotton has long been the most important crop, but recently there has been an increase in acreages of soybeans, oats, corn, hay, pasture, and rice. This trend to growing other crops was encouraged by acreage controls on cotton, increased expense for growing cotton, and shortages of labor.

This survey of Humphreys County was made cooperatively by the United States Department of Agriculture and the Mississippi Agricultural Experiment Station. It is part of the technical assistance furnished by the Soil Conservation Service to the Humphreys County Soil Conservation District. Residents of the county recognized a need for a soil survey in 1945 and voted a tax appropriation to pay for part of the cost.

Location and Extent

Humphreys County, located in the west-central part of Mississippi, is bounded by Sunflower and Leflore Counties on the north, by Holmes and Yazoo Counties on the east, by Yazoo County on the south, and by Sharkey and Washington Counties on the west (fig. 1). The meandering Big Sunflower River bounds it on the west, the Yazoo River on the southeast, and Tchula Lake on the east. Humphreys County covers about 410 square miles.

Belzoni, the county seat, is about 65 miles northwest of Jackson, Miss.; 140 miles south of Memphis, Tenn.; 30 miles southwest of Greenwood, Miss.; 35 miles southeast of Greenville, Miss.; and 65 miles northeast of Vicksburg, Miss.

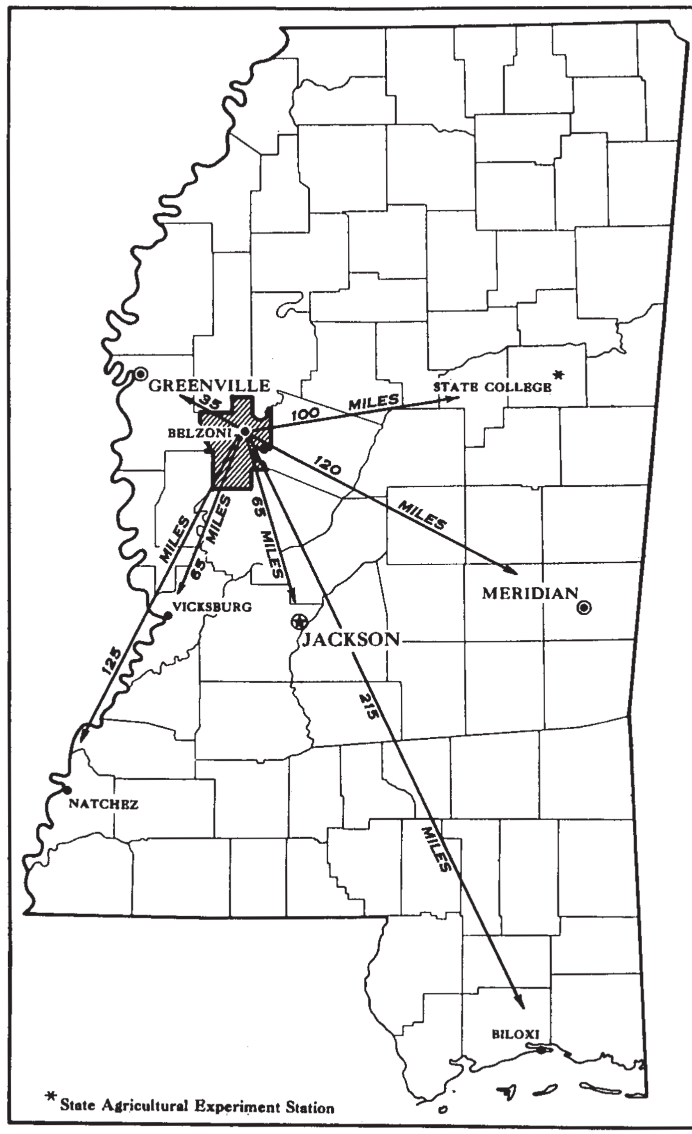

Figure 1.—**Location of Humphreys County in Mississippi.**

Physiography, Relief, and Drainage

Humphreys County is located on the broad flood plains of the Mississippi and Yazoo Rivers. These flood plains were once subject to stream overflow.

The elevation [1] of the county is 90 feet to slightly more than 120 feet above sea level and decreases from north to south. The highest parts of the county are on old natural levees along Paxton Brake in the north, at 120 feet elevation, and along Silver Creek in the southern part of the county, at 100 feet.

[1] Elevation data was taken from quadrangle maps prepared by the Mississippi River Commission and the Corps of Engineers, U. S. Army, Vicksburg District.

Much of the land is level, and about 95 percent has slopes of less than 2 percent. Some areas are well drained, but others are flooded for several months during most years. Some fairly large areas in the eastern part of the county are covered by water for such long periods that they are used only as woodland. In these areas, the Yazoo River floods and water from the river flows into nearby small lakes and bayous, which in turn overflow.

Along the Big Sunflower River, which forms part of the western boundary of the county, are a few small bayou-type tributaries that overflow in most years. In spite of these flooded areas, drainage of the county is now much better than formerly. A great many drainageways, ranging from large canals to shallow ditches, have been constructed.

Some of the bayous in the county are Atchafalaya, Bear Creek, Beasley, Beaver Dam, Browns, Buck, Ditchlow, Dry, Fisk, French, Gunn, Jackson, Little Atchafalaya, Little Jackson, Panther Creek, Silver Creek, Snake Creek, Straight, Tchula Lake, Twin Lakes, and Tupper.

Some of the lakes in the county are Big Kilby, Charlewan, Cold, Dead Man, Dent, Discovered, Fish, Five Mile, part of Four Mile, Gooden, Eagle, Little Kilby, Martin, Ole, Paxton Brake, Sky, Wasp, Wilson, and Wolf.

TABLE 1.—*Temperature and precipitation at Moorehead Station, Sunflower County, Miss.*

[Elevation, 117 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1936)	Wettest year (1919)	Average snowfall
	°F	°F	°F	Inches	Inches	Inches	Inches
December	46. 8	85	4	6. 21	4. 45	5. 00	0. 5
January	46. 0	83	−1	4. 86	4. 45	4. 40	. 4
February	49. 1	89	13	4. 09	3. 02	3. 31	. 3
Winter	47. 3	89	−1	15. 16	11. 92	12. 71	1. 2
March	56. 3	90	20	5. 33	3. 18	9. 77	. 4
April	63. 9	94	28	5. 18	4. 45	7. 33	0
May	71. 9	97	38	4. 58	1. 27	11. 92	0
Spring	64. 0	97	20	15. 09	8. 90	29. 02	. 4
June	79. 6	103	47	3. 86	1. 40	2. 80	0
July	81. 7	110	54	4. 12	2. 96	3. 65	0
August	81. 0	106	54	3. 29	. 73	5. 55	0
Summer	80. 8	110	47	11. 27	5. 09	12. 00	0
September	76. 3	108	35	2. 55	([3])	. 60	0
October	65. 1	97	23	2. 50	1. 07	9. 87	0
November	53. 6	85	14	3. 80	4. 20	10. 31	. 2
Fall	65. 0	108	14	8. 85	5. 27	20. 78	. 2
Year	64. 3	110	−1	50. 37	31. 18	74. 51	1. 8

[1] Average temperature based on a 43-year record, through 1955; highest temperature on a 17-year record and lowest temperature on an 18-year record, through 1930.

[2] Average precipitation based on a 43-year record, through 1955; wettest and driest years based on a 36-year record, in the period 1914–1955; snowfall based on a 16-year record, through 1930.

[3] Trace.

Climate

The climate of Humphreys County is of the humid, warm-temperate, continental type; the rainfall at Belzoni averages about 46 inches a year. Winters are fairly mild, and summers are rather hot. Spring and fall are pleasant. Table 1, compiled from records of the United States Weather Bureau at Moorehead Station, gives normal temperatures and precipitation for Sunflower County, Miss. These are considered to be representative of the ones in Humphreys County. The long growing season for crops extends from about March 26 until October 30. Many legumes and small grains grow throughout the winter.

Days and nights are usually warm late in spring, during the summer, and early in fall. Bright sunshine and high temperatures are typical in summer. Dense fogs may occur at daybreak, but they usually disappear early in the morning. The humidity is often high and is uncomfortable in the hot weather. Occasional thundershowers generally bring temporary relief from the heat.

Most of the rain falls in winter and spring. More than 4 inches of rain falls, on an average, each year in January, February, March, April, May, and December. Dry periods that limit the yields of such crops as corn, soybeans, and hay are common during the middle and latter parts of the growing season.

In winter the weather cycle is rising temperatures with increasing humidity, cloudiness, slow rain, clearing with much colder weather, frost, and then rising temperatures again. Violent winds, hailstorms, and ice sometimes damage trees and overhead wires.

Water Supply

Water for towns and communities normally comes from deep wells and is piped to the houses. Some wells, as at Belzoni, are 800 feet deep. The water in the Belzoni well was analyzed and was found to be about ideal for both household and commercial use. It had 174.2 parts per million of total solids,[2] no total hardness,[3] and a pH of 7.5. It is believed that wells 100 to 200 feet deep would supply sufficient water for most industries (*9*).[4]

Vegetation

When the first permanent settlements were made, Humphreys County was entirely covered with forests that consisted mostly of broadleaf deciduous trees. Cypress was the only native conifer. Where sufficient light penetrated the forest, a dense growth of cane and vines grew. Most of the county has been cleared, and the rest is in woodland.

In the wooded areas many of the trees are culls or of

[2] Distilled water contains no dissolved solids; normal ocean water contains approximately 35,000 parts per million (*9*).

[3] Total hardness of natural water may be caused by bicarbonates or sulfates, chlorides, or nitrates of calcium, magnesium, iron, or other minerals. Water that has less than 50 parts per million of these chemicals is considered soft; 50 to 100 parts per million is considered medium hard; and 100 to 200 parts per million is considered hard water (*9*).

[4] Italic numbers in parentheses refer to Literature Cited, p. 38.

low quality because of haphazard cutting, fires, and similar abuses. Some open, cutover, and fire-razed areas are overgrown with a dense growth of weeds, vines, and brush. Most forest areas are either near the Yazoo River and its tributaries in the eastern half of the county or near the Big Sunflower River and its tributaries in the southwestern part of the county.

The following fairly distinct forest types are recognized (5) in the county today: (1) Sweetgum, water oaks, and several similar species on the flat or nearly level areas; (2) white oaks, red oaks, and other hardwoods such as Delta post oak, hickory, and white ash on the coarser soils of the old natural levees; (3) hackberry, elm, and ash with bitter pecan, water oak, and similar species on low ridges and level areas, especially in cutover or burned areas; (4) overcup oak and bitter pecan with willow oak, hackberry, waterlocust, persimmon, soft elm, green ash, and similar species on the low, poorly drained, slack-water areas, in overflow basins, in swamps, and on fine-textured soils of low ridges; (5) willow with green ash, waterlocust, cypress, hackberry, and similar species in shallow and deep depressions and in swamps; and (6) cypress and tupelo-gum with willow, swamp blackgum, waterlocust, soft elm, bitter pecan, and similar species in areas that are flooded much of the year.

Normally, differences in vegetation can be associated with differences in drainage rather than with differences in soils. Iberia clay is perhaps an exception because it is covered by old cypress brakes and apparently developed mainly under cypress vegetation.

Wildlife

Humphreys County has range, feed, and water for abundant wildlife. There is about 100,000 acres of land in forest, and much of this is flooded frequently. There are also many rivers, lakes, bayous, and ponds. The farmlands, with pastures and fields of oats, soybeans, corn, and hay, are additional sources of food and shelter.

Squirrels, rabbits, and other small furbearing animals live throughout most of the county. Deer are seen in several areas. Quail (partridges) and mourning doves are the most numerous game birds, but ducks and geese are common during the winters that follow a wet autumn. Game is protected by laws administered by the State.

Management of Soils

This section has four parts. The first explains the system the Soil Conservation Service uses in grouping soils according to their capability; the second places the soils of Humphreys County in capability units or, as they are sometimes called, management groups; the third provides estimated ranges in yield for principal crops under common and improved management; and the fourth points out characteristics of the soils worth special consideration in irrigating, in draining, or in other ways controlling water on the land. Additional information about management of mapping units—the single soils shown on the detailed map—will be found in the section, Descriptions of Soils.

Capability Grouping of Soils

Capability grouping is a system of classification used to show the relative suitability of soils for crops, grazing, forestry, and wildlife. It is a practical grouping based on the needs, limitations, and risks of damage to the soils, and also on their response to management. There are three levels above the mapping unit in the grouping—capability unit, subclass, and class.

The capability unit, sometimes called a management group, is the lowest level of grouping. A capability unit is made up of soils similar in kind of management they need, in risk of damage, and in general suitability for use.

The next broader grouping, the subclass, is used to indicate the dominant kind of limitation. The letter symbol "e" indicates that the main limiting factor is risk of erosion if the plant cover is not maintained; "w" means excess water that retards plant growth or interferes with cultivation; and "s" shows that the soils are shallow, droughty, difficult to work, or unusually low in fertility.

The broadest grouping, the land class, is identified by Roman numerals. All the soils in one class have limitations and management problems of about the same degree, but of different kinds, as shown by the subclass. All the land classes except class I may have one or more subclasses.

In classes I, II, and III are soils that are suitable for annual or periodic cultivation of annual or short-lived crops. Class I soils are those that have the widest range of use and the least risk of damage. They are level, or nearly level, productive, well drained, and easy to work. They can be cultivated with almost no risk of erosion and will remain productive if managed with normal care.

Class II soils can be cultivated regularly, but they do not have quite so wide a range of suitability as class I soils. Some class II soils are gently sloping; consequently, they need moderate care to prevent erosion. Other soils in class II may be slightly droughty, or slightly wet, or somewhat limited in depth.

Class III soils can be cropped regularly but have a narrower range of use. These need even more careful management.

In class IV are soils that should be cultivated only occasionally or only under very careful management.

In classes V, VI, and VII are soils that normally should not be cultivated for annual or short-lived crops, but they can be used for pasture and range, as woodland, or for wildlife.

Class V soils are nearly level and gently sloping but are droughty, wet, low in fertility, or otherwise unsuitable for cultivation.

Class VI soils are not suitable for crops because they are steep, or droughty, or otherwise limited; but they give fair yields of forage or forest products. Some soils in class VI can, without damage, be cultivated to the extent that fruit trees or forest trees can be set out or pasture crops seeded.

Class VII soils provide only poor to fair yields of forage or forest products.

In class VIII are soils that have practically no agricultural use. Some of them have value as watersheds, wildlife habitats, or for scenery.

None of the soils of these last four classes occur in Humphreys County.

Class I. Soils that have few limitations in use.
- Unit 1 (I–1). Nearly level, mostly moderately well drained, loamy soils.

Class II. Soils moderately limited for use as cropland.
- Unit 2 (IIe–1). Gently sloping, mostly moderately well drained and well drained, loamy soils on old natural levees.
- Unit 3 (IIe–4). Gently sloping, moderately well drained to somewhat poorly drained, slightly eroded, acid silty clay loams.
- Unit 4 (IIs–3). Somewhat poorly drained and poorly drained loamy soils on old natural levees.
- Unit 5 (IIs–4). Somewhat poorly drained and poorly drained silty clay loams.
- Unit 6 (IIs–6). Nearly level, moderately well drained to somewhat poorly drained silty clay loams.

Class III. Soils severely limited but suitable for regular use as cropland.
- Unit 7 (IIIe–4). Somewhat poorly drained, slightly to moderately eroded silt loams on sloping old natural levees.
- Unit 8 (IIIs–4). Nearly level or gently sloping, poorly drained or somewhat poorly drained, clayey soils.
- Unit 9 (IIIw–4). Nearly level, poorly drained or somewhat poorly drained silt loams subject to backwater overflows.
- Unit 10 (IIIw–5). Level, poorly drained silty clay loams.
- Unit 11 (IIIw–6). Poorly drained, acid silty clay loams subject to backwater overflows.
- Unit 12 (IIIw–11). Level, poorly drained, acid clayey soils in slack-water areas.
- Unit 13 (IIIw–12). Poorly drained and very poorly drained, acid, clayey soils subject to backwater overflows.
- Unit 14 (IIIw–13). Level or nearly level, poorly drained mixture of soils of the depressions.
- Unit 15 (IIIw–14). Level or nearly level, poorly drained soils in depressed areas subject to backwater overflows.

Class IV. Soils very severely limited for use as cropland; suitable for cultivation part of the time or for special crops.
- Unit 16 (IVw–1). Level or nearly level, poorly drained or very poorly drained soils in depressions.
- Unit 17 (IVw–2). Level or nearly level, poorly drained to very poorly drained, clayey soils in depressed areas subject to backwater overflows.

Capability units

The soils of Humphreys County have been placed in 17 capability units, each of which is discussed in the following pages. All the soils in one unit need about the same kind of management, respond to management in about the same way, and have essentially the same limitations. The crop rotations mentioned are given as examples. They are not the only rotations suited to the soils in the group.

CAPABILITY UNIT 1 (I-1)

Nearly level, mostly moderately well drained, loamy soils:

Dubbs very fine sandy loam, nearly level phase.
Dubbs silt loam.
Dundee silt loam, nearly level phase.
Dundee very fine sandy loam.
Dundee-Pearson silt loams.

These acid soils occur in small to fairly large areas on the higher parts of old natural levees. The surface soils are silt loam or very fine sandy loam, 5 to 9 inches thick. The soils work easily, but if left bare they tend to crust and pack after rains. The silt loams crust so hard at times that stands of crops are poor.

The subsoils range in texture from silty clay to silt loam. They favor movement of water and air and the growth of roots.

Soils of this unit are well suited to cotton, corn, soybeans, sorghum, small grains, millet, and sudangrass. Vetch and wild winter peas are good as winter cover crops or for growing with small grains. These soils produce good permanent pastures of bermudagrass, dallisgrass, johnsongrass, whiteclover, vetch, and wild winter peas. Sudangrass and similar summer grasses do well. The soils are only fairly well suited to annual lespedeza, alfalfa, red clover, and fescue.

The trees that grow well on these soils are sweetgum, water oak, white oak, red oak, and other hardwoods.

Suitable crop rotations are (1) 6 years of row crops and 3 years of sod crops; and (2) 1 year of a row crop and 1 year of oats seeded with vetch.

Normally, little surface drainage is needed, but if necessary W-type ditches can be used to remove excess surface water.

These soils absorb and hold moisture well, but their supply of organic matter is low. It can be increased by turning under crop residues and using a cropping system that includes a sod crop. Growing winter legumes after clean-tilled crops helps increase or maintain the supply of organic matter.

Hard, compact layers, or plowpans, 2 to 14 inches thick, form readily just under the surface layer. They can be shattered by subsoiling late in fall. Most nonlegume crops respond to nitrogen fertilizer, and in some areas phosphate and potash are needed occasionally. Generally, the acidity of the soils must be corrected if the best yields of alfalfa are to be obtained.

CAPABILITY UNIT 2 (IIe-1)

Gently sloping, mostly moderately well drained and well drained, loamy soils on old natural levees:

Dubbs very fine sandy loam, gently sloping phase.
Dundee silt loam, gently sloping phase.

These slightly to moderately eroded, acid soils occur in narrow, fairly long bands on stronger slopes than those in capability unit 1 (I–1). The surface soils are silt loam or very fine sandy loam, 4 to 6 inches thick. They are easy to work, but if left bare they crust and pack after rains. Sometimes crusts on the silt loams cause poor stands of crops. The subsoils range in texture from silty clay to silt loam. They are permeable to water and air and allow good growth of plant roots.

Soils of this unit are well suited to cotton, corn, soybeans, small grains, millet, and sudangrass. Vetch and wild winter peas are good as winter cover crops or for growing with small grains. These soils produce good permanent pastures of bermudagrass, johnsongrass, dallisgrass, whiteclover, winter legumes, and summer grasses. They are only fairly well suited to annual lespedeza, fescue, alfalfa, and red clover.

The trees that grow well on these soils are sweetgum, water oak, white oak, red oak, and other hardwoods.

Suitable crop rotations are (1) 3 years of row crops and 3 years of sod crops; or (2) 1 year of a row crop and 1 year of oats seeded with vetch.

These are good soils for tilled crops, but their slope is strong enough to cause erosion if clean-tilled crops are grown continuously. Rows carefully laid out on the contour are needed to prevent further erosion and to conserve moisture. W-type ditches and grassed waterways are needed to remove excess surface water. The amount of organic matter is low and is difficult to maintain. A cropping sequence that includes sod crops will check further erosion and will help to increase and maintain the supply of organic matter. Hard, compact layers, or plowpans, tend to form below the plow layer. They can be shattered by subsoiling in the fall when the soils are dry. Fall plowing, however, will cause erosion during the normally heavy winter rains. Nitrogen is needed for most crops other than legumes. In some areas phosphate, potash, and lime are needed occasionally.

CAPABILITY UNIT 3 (IIe-4)

Gently sloping, moderately well drained to somewhat poorly drained, slightly eroded, acid silty clay loams:

The one soil in this unit is Dundee silty clay loam, gently sloping phase. It is in widely scattered, narrow bands on old natural levees. Its surface layer, a silty clay loam, is 3 to 5 inches thick. The subsoil is thick silty clay that somewhat restricts the movement of water and air.

Most of the crops commonly grown in the area do well on this soil, but the soil is only fairly well suited to corn and annual lespedeza. It supports good permanent pastures of perennial and summer grasses. Except for annual lespedeza, it is also well suited to the perennial and annual legumes.

The trees that grow well on this soil are hardwoods, as sweetgum, water oak, white oak, and red oak.

Suitable crop rotations are (1) 3 years of row crops followed by 1 year of sod crops; and (2) 2 years of nonlegume row crops followed by 1 year of oats and soybeans, or 1 year of oats and fallow.

The slopes are steep enough to erode readily when they are unprotected. Contour tillage can be used to control erosion, and some surface drainage is needed, as W-type ditches and grassed waterways. Excess moisture sometimes delays tillage. The soil is slowly permeable. It retains moisture well. The supply of organic matter is low, but it can be maintained by good management. Crop residues, shredded or cut in the fall, should be left on the ground over winter as a soil cover. Nitrogen fertilizer is needed for most crops.

CAPABILITY UNIT 4 (IIs-3)

Somewhat poorly drained and poorly drained loamy soils on old natural levees:

Forestdale silt loam, nearly level phase.
Forestdale silt loam, nearly level moderately shallow phase.
Forestdale silt loam, gently sloping phase.
Forestdale very fine sandy loam, nearly level phase.
Forestdale very fine sandy loam, gently sloping phase.
Forestdale-Brittain silt loams.

These acid, nearly level to gently sloping soils occur in small to large areas. Their surface soils are silt loam or very fine sandy loam, 4 to 8 inches thick.

The subsoils are thick silty clay or silt loam through which water and air move slowly.

Crops to which these soils are suited are soybeans, small grains, vetch, and wild winter peas. The soils are fairly well suited to corn, cotton, rice, sudangrass, and millet.

Good pasture crops are bermudagrass, johnsongrass, and winter legumes. The soils are fairly suitable for fescue, dallisgrass, white and red clovers, annual lespedeza, and summer grasses.

The forest trees that grow well on this soil are sweetgum, water oak, hackberry, elm, and ash.

Suitable crop rotations for these soils are (1) 2 years of row crops and 3 years of sod; and (2) 2 years of soybeans, with oats and winter legumes seeded after the second crop, and fallow after the oats are harvested the third year.

These soils are easy to work, but if they are left bare they pack, crust, puddle, and erode after rains. Rows that empty into V- or W-type ditches will remove excess water. Internal drainage is slow, and the soils retain a good supply of moisture for plants. Their supply of organic matter is low. Hard, compact layers, or plowpans, 2 to 14 inches thick, tend to form just under the plow layer. These should be shattered during the dry months late in fall. Fall plowing, however, exposes the soils to erosion from the heavy winter rains. Nitrogen is needed for most row crops that are not legumes. In some areas phosphate, potash, and lime are needed occasionally.

CAPABILITY UNIT 5 (IIs-4)

Somewhat poorly drained and poorly drained silty clay loams:

Alligator silty clay loam, nearly level phase.
Alligator silty clay loam, gently sloping phase.
Forestdale silty clay loam, nearly level phase.
Forestdale silty clay loam, nearly level shallow phase.
Forestdale silty clay loam, gently sloping phase.

These acid, nearly level or gently sloping soils occur in slack-water areas or on low old natural levees. The areas are small to large.

The surface soils are silty clay loam, 3 to 5 inches thick. The subsoils are thick silty clay or clay that greatly restricts the movement of water and air and the growth of roots.

These are good soils for pasture and hay. Growing row crops is hazardous, although the soils are suited to many kinds. The crops for which the soils are suited are soybeans, annual lespedeza, rice, small grains, vetch, wild winter peas, and sorghum. Cotton, sudangrass, and millet grow well, but the soils are generally not suited to corn and alfalfa.

Pasture plants that grow well are bermudagrass, johnsongrass, and winter legumes, but the soils are only fairly well suited to fescue, dallisgrass, white and red clovers, and the summer grasses. Trees that grow well on these soils are sweetgum and water oak.

Suitable crop rotations are (1) 2 years of row crops followed by 3 years of sod crops; (2) 2 years of cotton followed by 2 years of soybeans with oats seeded after the second crop of soybeans, and fallow after the oats have been harvested the following year; and (3) 1 year of cotton followed by 2 years of winter legumes grown for seed.

These soils are somewhat difficult to work. Rains during the growing season sometimes delay cultivation. Rows that empty into V- and W-type ditches will remove surface water and prevent ponding. Internal drainage is slow. These soils crack to some extent during dry spells. The amount of organic matter is low, and at times plowpans form below the plow layer. Nitrogen is needed for most nonlegume row crops, and in some areas phosphate, potash, and lime are needed occasionally.

CAPABILITY UNIT 6 (IIs-6)

Nearly level, moderately well drained to somewhat poorly drained silty clay loams:

The one member of this capability unit—Dundee silty clay loam, nearly level phase—is an acid soil that occurs in small, widely scattered areas on old natural levees.

The surface soil is silty clay loam, 3 to 5 inches thick. The subsoil is thick silty clay through which water and air move slowly.

This soil is well suited to most of the common crops, but it is only fairly well suited to corn, annual lespedeza, and rice.

Most of the perennial and summer grasses common to the area, as well as perennial and annual legumes, grow well on this soil.

The trees that grow well are sweetgum, water oak, white oak, red oak, and other hardwoods.

Suitable crop rotations are (1) 4 years of row crops followed by 2 years of sod; and (2) 3 years of row crops followed by 2 years of small grains.

This soil is somewhat difficult to work. Internal drainage is slow, but the water-holding capacity is good. Surface drainage may be needed. Excess water can be drained away through carefully laid out rows and W-type ditches. The low supply of organic matter can be maintained and increased by growing sod crops in the rotation. Generally, nitrogen is the only fertilizer needed.

CAPABILITY UNIT 7 (IIIe-4)

Somewhat poorly drained, slightly to moderately eroded silt loams on sloping old natural levees:

The one soil in this capability unit is Forestdale silt loam, moderately eroded sloping phase. This acid soil occurs in narrow, fairly short bands on the steepest slopes in the county.

The surface soil is silt loam, 2 to 5 inches thick. The subsoil is silty clay or silty clay loam that retards the movement of water and air.

This soil, if left bare, crusts, packs, and erodes readily after rains. Surface drainage is needed (fig. 2). Carefully laid out rows, contour tillage, W-type ditches, and, in places, grassed waterways will protect the soil and remove excess surface water.

Internal drainage is slow, but this soil retains moisture fairly well. The supply of organic matter is low, and it is difficult to maintain. Hard, compact layers, or plowpans, sometimes form below the plow layer. Nitrogen fertilizer is needed for row crops other than legumes, and lime, phosphate, and potash are needed in places.

This soil is well suited to small grains and winter legumes but is only fairly well suited to cotton, soybeans, and corn.

***Figure 2.*—Many field roads are located so as to separate soils used for different purposes. Dubbs very fine sandy loam, nearly level phase, is on the left of the road, and Forestdale silt loam, moderately eroded sloping phase, is on the right. Pipes under the road remove excess water to drainage ditches.**

Bermudagrass, johnsongrass, and winter legumes make good pasture on this soil. The soil is only fairly well suited to fescue, dallisgrass, white and red clovers, and annual lespedeza.

Trees that grow well on this soil are sweetgum, water oak, white oak, red oak, and other hardwoods.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod; and (2) 1 year of cotton followed by 2 years of oats or by soybeans and winter legumes. A permanent sod cover, however, is more desirable, because growing clean-tilled crops for successive years may cause an erosion hazard.

CAPABILITY UNIT 8 (IIIs-4)

Nearly level or gently sloping, poorly drained or somewhat poorly drained, clayey soils:

Alligator clay, nearly level phase.
Alligator clay, gently sloping phase.
Forestdale silty clay, nearly level phase.
Forestdale silty clay, gently sloping phase.
Iberia clay.

These acid soils occur in small to large tracts, mostly in slack-water areas. The surface soils are clay or silty clay, 2 to 5 inches thick. The subsoils are clay that restricts the movement of water and air and allows the roots of most plants to penetrate to only shallow depths.

These soils are not easy to manage. It is difficult to get a good stand of crops, because the soils swell and seal over when wet and crack severely when dry. The soils are usually either too wet or too dry to cultivate. Rows must be laid out so as to give the maximum amount of drainage with the least erosion. This can be done by digging many V- and W-type ditches.

Internal drainage is very slow when the soils are wet. The low supply of organic matter is fairly easy to maintain. If these soils are to be cultivated, it is desirable to break them the preceding fall, because spring breaking leaves them very cloddy, and they remain cloddy throughout the growing season. Nitrogen fertilizer is needed for nonlegumes. Some legume crops need lime. These soils produce good pasture and hay crops.

These soils are well suited to small grains, rice, soybeans, vetch, and wild winter peas but are only fairly well suited to cotton, sudangrass, millet, and annual lespedeza. Corn is an uncertain crop.

Bermudagrass, dallisgrass, johnsongrass, fescue, and white and red clovers make good pasture on these soils. Trees that grow well are sweetgum and water oak.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod; (2) 1 year of cotton and 2 years of small grains or soybeans; (3) 2 or 3 years of rice and 3 years of pasture, small grains and vetch, or soybeans; and (4) 1 year of cotton followed by 2 years of winter legumes grown for seed.

CAPABILITY UNIT 9 (IIIw-4)

Nearly level, poorly drained or somewhat poorly drained silt loams subject to backwater overflows:

The one soil in this capability unit is Forestdale silt loam, nearly level overflow phase. The surface soil is silt loam, 4 to 6 inches thick. The subsoil is thick silty clay through which water and air move slowly.

This soil is well suited to soybeans and sorghum and is fairly well suited to millet and sudangrass. Floods limit its use for winter grasses, small grains, winter legumes, and occasionally for cotton, corn, and rice.

This soil is fairly well suited to summer grasses and legumes grown as pasture crops. It is not suited to perennial grasses and clover because of the risk of overflows.

Forest trees that grow well on this soil are sweetgum, water oak, hackberry, elm, ash, overcup oak, and bitter pecan.

Suitable crop rotations are (1) 2 years of nonlegume row crops followed by 3 years of soybeans; and (2) 2 years of row crops followed by 3 years of summer grasses or legumes.

This acid soil is easy to work, but if left bare it crusts, packs, and puddles after rains. Some surface drainage is needed. Internal drainage is slow, and the soil retains a fair amount of water for plants.

This soil is flooded frequently, and the backwaters may stay on the surface for several days or several weeks. The floodwaters often prevent planting cotton and similar crops and sometimes damage crops already planted and cultivated. The supply of organic matter is low and is difficult to maintain. Hard, compact layers, or plowpans, form at times below the plow layer. Nitrogen is needed for all row crops that are not legumes. Phosphate, potash, and lime are needed occasionally in places.

CAPABILITY UNIT 10 (IIIw-5)

Level, poorly drained silty clay loams:

This unit consists of a single acid soil, Forestdale silty clay loam, level phase. The soil occurs in small patches scattered throughout the slack-water areas.

The surface layer is silty clay loam, 4 to 5 inches thick. The subsoil is thick silty clay or clay through which water and air move slowly. The subsoil is unfavorable for plant roots, and they penetrate to only shallow depths.

This soil is suited to soybeans, annual lespedeza, rice, small grains, vetch, wild winter peas, and sorghum and is fairly well suited to sudangrass and millet. It is risky to try to grow cotton, corn, or alfalfa.

The soil is only fairly well suited to fescue, dallisgrass, red and white clovers, and summer grasses, but bermudagrass, johnsongrass, and winter legumes make good pasture.

Forest trees that grow well on this soil are sweetgum, water oak, white oak, red oak, and other hardwoods.

Suitable crop rotations are (1) 2 years of row crops followed by 3 years of sod crops; (2) 2 years of cotton and 2 years of soybeans with the second crop of soybeans followed by oats, and fallow after the oats have been harvested the following year; and (3) 1 year of cotton followed by 2 years of winter legumes grown for seed.

Runoff and internal drainage are slow, and the soil retains only a fair amount of water for plants. Runoff from higher soils often collects and ponds on this soil. Excess water often seriously delays planting and cultivating. Rows that empty into V- and W-type ditches are needed to prevent ponding and to provide adequate outlets for the excess surface water. This soil cracks during dry periods. The supply of organic matter is low, and nitrogen is needed for nonlegume crops. Lime, phosphate or potash may be needed occasionally in places.

CAPABILITY UNIT 11 (IIIw-6)

Poorly drained, acid silty clay loams subject to backwater overflows:

Alligator silty clay loam, nearly level overflow phase.
Forestdale silty clay loam, nearly level overflow phase.
Forestdale silty clay loam, gently sloping overflow phase.

These acid, nearly level or gently sloping soils occur in small to fairly large areas. The surface layers are silty clay loam, 3 to 5 inches thick. The subsoils are thick silty clay or clay that retards the movement of water and air and causes roots to grow to only shallow depths. In some places the subsoils are underlain by coarser material.

These soils are well suited to soybeans, annual lespedeza, and sorghum and are fairly well suited to sudangrass and millet. They are generally unsuitable for corn and alfalfa. Floods limit their use for small grains, winter grasses, and winter legumes, and occasionally for cotton and rice.

These soils are fairly well suited to summer annual grasses grown for pasture. They are not suitable for perennial grasses and legumes, because of the risk of flooding.

Forest trees that grow well on these soils are sweetgum and water oak.

Suitable crop rotations are (1) 2 years of nonlegume row crops followed by 3 years of soybeans; and (2) 2 years of nonlegume row crops followed by 4 years of annual lespedeza or summer grasses.

These soils are somewhat difficult to work. Sometimes they are flooded for several days and sometimes for several weeks. Often the floodwaters do not recede in time for cotton and similar crops to be planted. At times crops already planted and cultivated are flooded. Rains may delay cultivation during the growing season. Internal drainage is slow, and surface drainage is generally needed. Carefully laid out rows and V- and W-type ditches are necessary to prevent ponding and to provide outlets for excess water. The soils shrink and crack to some extent during dry periods. The supply of organic matter is low. Nitrogen is needed for nonlegume row crops. Lime, phosphate, and potash are needed occasionally in places.

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CAPABILITY UNIT 12 (IIIw-11)

Level, poorly drained, acid clayey soils in slack-water areas:

Only one soil, Alligator clay, level phase, is in this unit. The small to large areas have a surface layer of clay, 2 to 4 inches thick. The subsoil is clay that retards the movement of water and air and allows plant roots to penetrate to only shallow depths.

This soil is good for pasture and hay. Although it is suited to many crops, poor drainage makes it uncertain for row crops. It is suited to soybeans, rice, and sorghum, but it is only fairly well suited to sudangrass and millet. Unless the surface soil is drained extensively, this soil is limited to small grains, vetch, wild winter peas, and cotton. Corn does not grow well.

Good pasture plants are bermudagrass, dallisgrass, johnsongrass, fescue, and whiteclover. This soil is only fair for sudangrass, red clover, and annual lespedeza.

Forest trees that grow well on this soil are sweetgum, hackberry, water oak, elm, and ash.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod crops; (2) 2 or 3 years of rice followed by 3 years of pasture, small grains, or soybeans; (3) 1 year of nonlegume row crops followed by 2 years of summer legumes; and (4) 1 year of nonlegume row crops followed by 2 years of winter legumes grown for seed.

This poorly drained soil is difficult to manage. The thin surface layer and the poor tilth generally limit its use. It is very plastic and sticky when wet so that it seals over and puddles. When dry, it cracks severely so that it injures the roots of some plants. Surface runoff is slow, and internal drainage is very slow. The runoff from higher areas collects and ponds on this soil. Extensive drainage is needed to remove excess surface water. Drainage can be provided by carefully laid out rows that empty into V- and W-type ditches. The supply of organic matter is low. Nonlegume row crops respond well to nitrogen fertilizer, and some legume crops need lime.

CAPABILITY UNIT 13 (IIIw-12)

Poorly drained and very poorly drained, acid, clayey soils subject to backwater overflows:

Alligator clay, nearly level overflow phase.
Alligator clay, level overflow phase.
Alligator-Dowling clays, overflow phases.
Alligator, Dowling, and Forestdale soils, overflow phases.

These soils occur in small to large areas. The surface layers are mostly clay or silty clay with patches of silty clay loam and silt loam. The subsoils are thick clay or silty clay through which water and air move slowly and roots penetrate to only shallow depths. The subsoils are underlain in places by coarser material.

These soils are suited to soybeans and sorghum and are fairly well suited to sudangrass and millet. Floods make it risky to grow corn and cotton. The growing of small grains, perennial and winter grasses, legumes, and sometimes rice is limited by the risk of floods.

These soils are fairly well suited to summer grasses and annual lespedeza for pasture.

Forest trees that grow well on these soils are sweetgum, water oak, hackberry, elm, and ash.

Suitable crop rotations are (1) 2 years of nonlegume row crops followed by 4 years of soybeans; and (2) 2 or 3 years of rice followed by 3 years of soybeans or annual lespedeza.

These soils are usually too wet or too dry for cultivation. They are often flooded for several days. At times the water stands for several weeks. In many years the floodwaters do not recede early enough for the farmer to plant cotton and similar crops. Also, crops already planted are likely to be flooded.

These soils are very plastic when wet so that they seal and puddle, and they are poorly aerated. When dry, they shrink and crack severely enough to injure the roots of some plants. Surface runoff is slow to very slow, and internal drainage is very slow. Carefully laid out rows and V- and W-type ditches are needed to drain off excess surface water. The supply of organic matter is low. The soils generally respond well to nitrogen. Lime is beneficial for some crops.

CAPABILITY UNIT 14 (IIIw-13)

Level or nearly level, poorly drained mixture of soils of the depressions:

In this unit are the Dowling soils, which occur in long, narrow depressions. Runoff water from nearby higher soils accumulates in the low places and deposits additional soil material.

The surface layers range in texture from clay to silt loam. The subsoils are clay in which there are lenses of coarser material in places. The clay subsoils retard the movement of water and air and the growth of plant roots. These soils are well suited to rice and sorghum. They are fairly well suited to soybeans, corn, wheat, vetch, and wild winter peas. Oats, barley, and row crops such as cotton are uncertain because of the frequent floods.

Pasture crops to which the soils are fairly well suited are fescue, bermudagrass, dallisgrass, sudangrass, white clover, and millet, but johnsongrass and red clover do not grow well.

Forest trees that grow well on these soils are sweetgum, water oak, hackberry, elm, ash, overcup oak, and bitter pecan.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod crops; and (2) permanent meadow.

Because of the very slow surface drainage and lack of drainage outlets, these soils are sometimes flooded for fairly long periods after rains. Also, they are becoming poorly aerated because of poor internal drainage. Fertility is fairly high, and the supply of organic matter, though fairly low, is higher than in the surrounding soils. The low position, poor drainage, and fine texture of the subsoil prevent plants from using fertilizers at top efficiency. Extensive surface drainage is needed to grow crops.

CAPABILITY UNIT 15 (IIIw-14)

Level or nearly level, poorly drained soils in depressed areas subject to backwater overflows:

This group is made up of Dowling soils, overflow phases. The soils occur in long, narrow strips in depressed areas. In texture, the surface layers range from clay to silt loam. The subsoils are clay in which there are lenses of coarser material in places.

Row crops are generally uncertain on these soils. The soils are well suited to sorghum but, at best, are only fairly well suited to soybeans and corn. At times floods delay or prevent the planting of rice. The soils are generally unsuitable for cotton, small grains, and winter legumes.

Pasture crops for which the soils are fairly suitable are annual summer grasses and lespedeza. Legumes and perennial and winter grasses are limited as crops because of the risk of flooding.

Forest trees that grow well on these soils are sweetgum, water oak, hackberry, elm, ash, overcup oak, and bitter pecan.

Suitable crop rotations are (1) 1 year of row crops followed by 2 or 3 years of summer grasses or legumes; and (2) permanent meadow.

These soils are difficult to manage. They are subject to overflows and also receive runoff from surrounding higher soils. Unless drainage outlets are provided, the soils are often ponded most of the year. Internal drainage is slow, and aeration is poor. Fertility is fairly high, but the low position, poor drainage, and fine texture of the subsoil prevent plants from using fertilizers efficiently.

CAPABILITY UNIT 16 (IVw-1)

Level or nearly level, poorly drained or very poorly drained soils in depressions:

The one soil in this capability unit, Dowling clay, occurs in long, fairly narrow areas. Runoff water from nearby higher soils accumulates in these low areas and periodically deposits additional soil material. The clay surface soil varies in thickness, depending on the amount of recent alluvium that has been deposited from runoff water. The subsoil is clay, which greatly retards water and air movement in the soil and causes the roots of most plants to penetrate to only shallow depths.

This soil is fairly good for hay and pasture. It is well suited to rice but only fairly well suited to sorghum, soybeans, millet, and sudangrass. Cotton and corn are uncertain crops.

Pasture crops to which the soil is fairly well suited are fescue, bermudagrass, dallisgrass, and white clover. The soil is not suited to johnsongrass and red clover.

Forest trees that grow well on this soil are bitter pecan, cottonwood, cypress, tupelo-gum, willow, and overcup oak.

Suitable crop rotations are (1) 2 years of soybeans followed by 2 years of rice; (2) summer annual crops; and (3) 2 years of summer annuals or soybeans followed by 4 years of sod crops.

Drainage is a problem on this soil, and outlets are often inadequate. Surface drainage is very slow, and runoff from higher areas collects and ponds during wet periods. Extensive surface drainage is needed to grow crops. The excess water often delays the planting and cultivating of row crops. When the soil is dry, it shrinks and cracks so that the roots of some plants are injured. It is fairly fertile, but its low position, poor drainage, and fine texture prevent plants from using fertilizers efficiently.

CAPABILITY UNIT 17 (IVw-2)

Level or nearly level, poorly drained to very poorly drained, clayey soils in depressed areas subject to backwater overflows:

The single soil in this unit is Dowling clay, overflow phase. The surface layer is clay that varies in thickness, depending on the amount of recent alluvium that has been deposited from runoff water. The clay subsoil retards the movement of water and air; most plant roots penetrate to only shallow depths.

The risk of overflow limits the use of this soil mostly to forest or summer annuals. It is uncertain for row crops and, at most, is only fairly well suited to soybeans, sorghum, sudangrass, and millet. Cotton and corn are uncertain crops because of the water hazard. The planting of rice is prevented or delayed because of excess surface water.

This soil is fairly well suited to summer annual grasses and clovers seeded together as pasture crops. The risk of flooding, however, prevents the use of perennials and winter annuals.

Forest trees that grow well on this soil are bitter pecan, cottonwood, cypress, tupelo-gum, willow, and overcup oak.

Suitable crop rotations are (1) continuous summer annual grasses and legumes; and (2) 2 years of rice followed by 2 years of soybeans.

This soil is difficult to manage. Excess water limits the growing season and generally prevents the use of perennials. Excess water often seriously delays or prevents planting crops in spring and cultivating them during the growing season. This soil is subject to backwater overflows and also receives runoff from surrounding higher soils. It may be flooded most of the year unless drainage outlets are provided. Internal drainage is very slow, and aeration is poor. The soil is fairly fertile, but the excess water prevents plants from using the nutrients efficiently.

Estimated Yields

Estimated average acre yields are given in table 2 for the principal crops of Humphreys County. The yields are listed by capability units at two levels of management. The yields in columns A are those to be expected under common management. Under such management only part of the practices listed for improved, or good, management are used. The soils may be fertilized or drained only partially, or a suitable crop rotation may not be used. In other places yields may be obtained that are comparable to those under common management because the seedbed has not been prepared carefully, unsuitable crops have been chosen, or inadequate insect control has been used.

Yields in columns B were obtained under improved management. Under this level of management, the soils are adequately drained and fertilized and a suitable crop rotation is used to provide good tilth and to maintain at least the present content of organic matter. The seedbed is prepared carefully, the most suitable crops are chosen, adequate insecticides are used, and all the other proven cultural practices of the area, except irrigation, are practiced.

TABLE 2.—*Estimated average acre yields of principal crops under two levels of management*

[Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management]

Capability unit and soil	Cotton (lint)		Corn		Oats		Soybeans [1]		Rice [2]		Permanent pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
Unit 1 (I–1)—Nearly level, moderately well drained, loamy soils:	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Acres per animal unit* [3]	*Acres per animal unit* [3]
Dubbs very fine sandy loam, nearly level phase	600	850	40	85	35	55	15	25	([4])	([4])	4. 2	2. 2
Dubbs silt loam	600	850	40	85	35	55	15	25	([4])	([4])	4. 2	2. 2
Dundee silt loam, nearly level phase	600	800	40	85	35	55	15	25	([4])	([4])	4. 2	2. 2
Dundee very fine sandy loam	600	815	40	85	35	55	15	25	([4])	([4])	4. 2	2. 2
Dundee-Pearson silt loams	575	800	40	85	35	55	15	25	([4])	([4])	4. 2	2. 2
Unit 2 (IIe–1)—Gently sloping, mostly moderately well drained and well drained, loamy soils on old natural levees:												
Dubbs very fine sandy loam, gently sloping phase	525	700	35	60	33	55	10	15	([4])	([4])	4. 2	2. 4
Dundee silt loam, gently sloping phase	525	650	35	60	35	55	10	15	([4])	([4])	4. 2	2. 4
Unit 3 (IIe–4)—Gently sloping, moderately well drained to somewhat poorly drained, slightly eroded, acid silty clay loams:												
Dundee silty clay loam, gently sloping phase	400	500	25	45	35	55	15	20	([4])	([4])	5. 5	3. 5
Unit 4 (IIs–3)—Somewhat poorly drained and poorly drained loamy soils on old natural levees:												
Forestdale silt loam:												
Nearly level phase	375	550	35	55	30	50	15	25	40	70	4. 2	2. 3
Nearly level moderately shallow phase	350	475	25	50	25	50	12	25	40	70	4. 5	2. 5
Gently sloping phase	350	450	25	50	25	50	12	25	40	50	4. 5	2. 5
Forestdale very fine sandy loam:												
Nearly level phase	450	675	35	65	30	55	15	25	40	50	4. 2	2. 3
Gently sloping phase	375	500	30	50	25	50	12	25	40	50	4. 5	2. 5
Forestdale-Brittain silt loams	375	550	35	55	30	50	15	25	40	60	4. 2	2. 3
Unit 5 (IIs–4)—Somewhat poorly drained and poorly drained silty clay loams:												
Alligator silty clay loam:												
Nearly level phase	350	425	25	50	25	50	15	30	40	70	5. 5	2. 8
Gently sloping phase	325	400	25	40	30	50	15	25	40	70	5. 5	2. 8
Forestdale silty clay loam:												
Nearly level phase	350	475	25	50	30	50	15	30	40	70	5. 5	2. 8
Nearly level shallow phase	350	425	25	50	25	50	15	30	40	70	5. 5	2. 8
Gently sloping phase	325	400	25	40	30	50	15	25	40	70	5. 5	2. 8
Unit 6 (IIs–6)—Nearly level, moderately well drained to somewhat poorly drained silty clay loams:												
Dundee silty clay loam, nearly level phase	475	625	30	50	35	55	15	25	35	50	4. 5	2. 5
Unit 7 (IIIe–4)—Somewhat poorly drained, slightly to moderately eroded silt loams on sloping old natural levees:												
Forestdale silt loam, moderately eroded sloping phase	([4])	([4])	([4])	([4])	25	50	([4])	([4])	([4])	([4])	6. 0	4. 0
Unit 8 (IIIs–4)—Nearly level or gently sloping, poorly drained or somewhat poorly drained, clayey soils:												
Alligator clay:												
Nearly level phase	250	400	20	45	30	50	12	30	40	70	6. 0	3. 0
Gently sloping phase	250	400	20	45	30	50	12	25	40	60	5. 5	3. 5
Forestdale silty clay:												
Nearly level phase	250	400	20	45	30	50	12	30	40	70	6. 0	3. 0
Gently sloping phase	250	400	20	45	30	50	12	25	40	60	5. 5	3. 5
Iberia clay	275	425	20	50	25	45	15	30	40	70	6. 0	3. 0
Unit 9 (IIIw–4)—Nearly level, poorly drained or somewhat poorly drained silt loams subject to backwater overflows:												
Forestdale silt loam, nearly level overflow phase	([4])	([4])	([4])	([4])	([4])	([4])	10	20	30	60	8. 0	6. 0
Unit 10 (IIIw–5)—Level, poorly drained silty clay loams:												
Forestdale silty clay loam, level phase	200	300	15	25	([4])	([4])	12	30	40	70	6. 0	4. 0
Unit 11 (IIIw–6)—Poorly drained, acid silty clay loams subject to backwater overflows:												
Alligator silty clay loam, nearly level overflow phase	([4])	([4])	([4])	([4])	([4])	([4])	10	20	30	60	8. 0	6. 0
Forestdale silty clay loam:												
Nearly level overflow phase	([4])	([4])	([4])	([4])	([4])	([4])	10	20	30	60	8. 0	6. 0
Gently sloping overflow phase	([4])	([4])	([4])	([4])	([4])	([4])	10	20	30	60	8. 0	5. 5
Unit 12 (IIIw–11)—Level, poorly drained, acid clayey soils in slack-water areas:												
Alligator clay, level phase	200	300	15	25	([4])	([4])	12	30	40	70	6. 0	4. 0

See footnotes at end of table.

TABLE 2.—*Estimated average acre yields of principal crops under two levels of management*—Continued

[Yields in columns A are those obtained under common management; yields in columns B are those obtained under good managment

Capability unit and soil	Cotton (lint)		Corn		Oats		Soybeans [1]		Rice [2]		Permanent pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
Unit 13 (IIIw-12)—Poorly drained and very poorly drained, acid, clayey soils subject to backwater overflows:												
Alligator clay:	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Acres per animal unit* [3]	*Acres per animal unit* [3]
Nearly level overflow phase	(4)	(4)	(4)	(4)	(4)	(4)	10	20	30	60	8. 0	6. 0
Level overflow phase	(4)	(4)	(4)	(4)	(4)	(4)	10	20	(4)	(4)	8. 0	6. 0
Alligator-Dowling clays, overflow phases	(4)	(4)	(4)	(4)	(4)	(4)	10	20	(4)	(4)	8. 0	6. 0
Alligator, Dowling, and Forestdale soils, overflow phases	(4)	(4)	(4)	(4)	(4)	(4)	10	20	30	60	8. 0	6. 0
Unit 14 (IIIw-13)—Level or nearly level, poorly drained mixture of soils of the depressions:												
Dowling soils	200	300	15	35	(4)	(4)	15	30	35	70	5. 0	2. 8
Unit 15 (IIIw-14)—Level or nearly level, poorly drained soils in depressed areas subject to backwater overflows:												
Dowling soils, overflow phases	(4)	(4)	(4)	(4)	(4)	(4)	8	15	(4)	(4)	8. 0	6. 0
Unit 16 (IVw-1)—Level or nearly level, poorly drained or very poorly drained soils in depressions:												
Dowling clay	(4)	(4)	(4)	(4)	(4)	(4)	15	30	35	70	8. 0	4. 0
Unit 17 (IVw-2)—Level or nearly level, poorly drained to very poorly drained, clayey soils in depressed areas subject to backwater overflows:												
Dowling clay, overflow phase	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)

[1] Yields vary with rainfall; highest yields are obtained during wet growing seasons.
[2] After 2 succeeding years of growing rice, yields often decline sharply. Yields for the soils subject to flooding may be greatly reduced by nonseasonal overflows.
[3] An animal unit is equivalent to 1 cow, steer, or horse; 5 hogs; 7 sheep; or 7 goats.
[4] Crops not recommended. However, fair yields may be obtained occasionally.

Engineering Applications[5]

This soil survey report for Humphreys County contains information that can be used by engineers to—

(1) Make soil and land use studies that will aid in the selection and development of industrial, business, residential, and recreational sites.

(2) Assist in designing drainage and irrigation systems and planning dams and other structures for water and soil conservation.

(3) Make reconnaissance surveys of soil and ground conditions that will aid in selecting highway and airport locations and in planning detailed soil surveys for the intended locations.

(4) Locate sand and gravel for use in structures.

(5) Develop information that will be useful in designing and maintaining pavements.

(6) Determine the suitability of soil units for cross-county movements of vehicles and construction equipment.

(7) Supplement information obtained from other published maps and reports and aerial photographs, for the purpose of making soil maps and reports that can be used readily by engineers.

[5] This section was prepared cooperatively by the Bureau of Public Roads and the Soil Conservation Service. Test data in table 5 were obtained in the Soils Laboratory, Bureau of Public Roads.

The mapping and the descriptive report are somewhat generalized and should be used only in planning more detailed field surveys to determine the in-place condition of the soil at the site of the proposed engineering construction.

Advice on drainage and control of runoff can be obtained through the county agent or the local representative of the Soil Conservation Service. Advice on the use of soil materials in roads can be obtained from the State Highway Department. A summary of the primary engineering features of the soils in the county is given in table 3.

Table 4 gives a more detailed estimate of the normal range in physical properties of some of the soils, by layers, than is given in table 3. The depth indicated for the respective layers is the same as given in the typical profile described for that particular soil in the section, Descriptions of Soils. Some of the estimates of physical and chemical properties indicated in table 4 are based on the data in table 5 that were obtained by testing soil samples from a major soil type of the three most extensive soil series in the county.

The Unified (*10*) and A. A. S. H. O. (*1*) engineering classifications in table 5 are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. Mechanical analyses were made by combined sieve and hydrometer methods. Percentages of clay obtained by the hydrometer method should not be used in naming the soil textural class.

TABLE 3.—*Summary of principal characteristics of the soils significant to engineering*

Soil map symbol	Soil name	Slopes	Depth to seasonally high water table	Brief description of soil
	Alligator clay:	*Percent*	*Feet*	
Aa	Level phase	0 to ½		
Ab	Level overflow phase	0 to ½		
Ac	Nearly level phase	½ to 2		
Ad	Nearly level overflow phase	½ to 2		
Ae	Gently sloping phase	2 to 5	0-1	Poorly drained predominantly very plastic clay (CH; A–7) that occurs in slack-water areas. Overflow phases are flooded for several months each year; some of the other soils are flooded occasionally.
	Alligator silty clay loam:			
Ag	Nearly level phase	½ to 2		
Ah	Nearly level overflow phase	½ to 2		
Ak	Gently sloping phase	2 to 5		
Am	Alligator-Dowling clays, overflow phases	0 to ½	0	See elsewhere in this report the descriptions of overflow phases of Alligator and Dowling soils. Alligator soils predominate.
An	Alligator, Dowling, and Forestdale soils, overflow phases.	0 to 2	0	See elsewhere in this report the descriptions of overflow phases of Alligator, Dowling, and Forestdale soils.
Da	Dowling clay	0 to 2	0	Poorly drained to very poorly drained, predominantly very plastic clay (CH; A–7); occurs in depressions. Normally flooded after each rain.
Db	Dowling clay, overflow phase			
Dc	Dowling soils	0 to ½	0	Poorly drained to very poorly drained silt loam to clay (ML to CH; A–4 to A–7); occurs in depressions. Normally flooded for long periods.
Dd	Dowling soils, overflow phases			
De	Dubbs silt loam	0 to 2		
	Dubbs very fine sandy loam:		4+	Moderately well drained to well drained stratified materials that are predominantly sandy loams to silty clays (ML to CH; A–4 to A–7); on old natural levees.
Dg	Nearly level phase	½ to 2		
Dh	Gently sloping phase	2 to 5		
	Dundee silty clay loam:			
Dk	Nearly level phase	½ to 2		
Dm	Gently sloping phase	2 to 5		
	Dundee silt loam:			
Dn	Nearly level phase	½ to 2	2–4	Moderately well drained to somewhat poorly drained stratified materials that are predominantly silt loams to silty clay (ML to CH; A–4 to A–7); on old natural levees.
Do	Gently sloping phase	2 to 5		
Dp	Dundee very fine sandy loam	0 to 2		
Dr	Dundee-Pearson silt loams	0 to 2	2–4	Complex is composed of Dundee silt loam; Pearson silt loam; and Pearson silt loam, moderately shallow, in approximately equal proportions; soil materials of Pearson silt loams are similar to those of the Dundee soils.
	Forestdale silty clay:			
Fa	Nearly level phase	½ to 2		
Fb	Gently sloping phase	2 to 5		
	Forestdale silty clay loam:			
Fc	Level phase	0 to ½		
Fd	Nearly level phase	½ to 2		
Fe	Nearly level overflow phase	½ to 2		
Fg	Nearly level shallow phase	½ to 2		
Fh	Gently sloping phase	2 to 5		
Fk	Gently sloping overflow phase	2 to 5	0–2	Somewhat poorly drained to poorly drained stratified materials that range in texture from silt loam to clay (ML to CH; A–4 to A–7); occur at low elevations on old natural levees. Some areas are flooded occasionally.
	Forestdale silt loam:			
Fm	Nearly level phase	½ to 2		
Fn	Nearly level overflow phase	½ to 2		
Fo	Nearly level moderately shallow phase	½ to 2		
Fp	Gently sloping phase	2 to 5		
Fr	Moderately eroded sloping phase	5 to 8		
	Forestdale very fine sandy loam:			
Fs	Nearly level phase	½ to 2		
Ft	Gently sloping phase	2 to 5		
Fu	Forestdale-Brittain silt loams	½ to 5	½–2	Complex is composed of Forestdale silt loam; Brittain silt loam; and Brittain silt loam, moderately shallow, in approximately equal proportions. The Brittain soils are similar to the Forestdale soils.
Ia	Iberia clay	0 to ½	0–1	Poorly drained very plastic clay that contains various amounts of organic matter throughout the profile (CH or OH; A–7); occurs in slack-water areas.
	Swamp	0 to ½	0	Poorly drained to very poorly drained clay (CH; A–7); in places is underlain at depths greater than 1½ feet by sandy material (SM or SC; A–2 or A–4). Normally flooded for long periods each year.

TABLE 4.—*Estimated physical and chemical properties of a representative soil of each series, based on interpretations of soil survey data*

Soil	Depth from ground surface	Engineering soil classification		Structure	Permeability	Available moisture-holding capacity [1]	pH	Shrink-swell potential	Suitability as source of topsoil
		Unified	A. A. S. H. O.						
	Inches				*Inches per hour*	*Inches per foot*			
Alligator clay, nearly level phase.	0 to 3	CH	A-7	Granular	Less than 0.05	3.0	5.1 to 6.0	High to very high.	Not suitable.
	3 to 30	CH	A-7	Massive to subangular blocky.	Less than .05	3.0	4.5 to 5.5	Very high	Not suitable.
	30 to 60+	CH	A-7	Massive	Less than .05	3.0	5.1 to 6.5	Very high	Not suitable.
Dowling clay	0 to 3	CH	A-7	Granular	Less than .05	3.0	5.6 to 6.5	High to very high.	Not suitable.
	3 to 10	CH	A-7	Massive	Less than .05	3.0	5.6 to 6.5	Very high	Not suitable.
	10 to 50+	CH	A-7	Massive	Less than .05	3.0	6.1 to 6.5	Very high	Not suitable.
Dubbs very fine sandy loam, nearly level phase.	0 to 7	ML	A-4	Crumb	.8 to 2.5	1.8	5.6 to 6.0	Low	Fair to good.
	7 to 18	CL	A-6 or A-7	Subangular blocky.	.2 to .8	1.8	4.5 to 5.0	Moderate	Poor.
	18 to 25	CL	A-6 or A-7	Subangular blocky.	.8 to 2.5	1.8	4.5 to 5.0	Moderate	Poor.
	25 to 60+	CL	A-6	Subangular blocky to structureless.	.8 to 2.5	1.5	5.1 to 5.5	Low	Poor to fair.
Dundee silt loam, nearly level phase.	0 to 6	ML or CL	A-4 or A-6	Crumb	.8 to 2.5	2.0	5.1 to 5.5	Low	Fair to good.
	6 to 22	CL or CH	A-7	Subangular to angular blocky.	.2 to .8	2.2	4.5 to 5.0	Moderate	Poor.
	22 to 36	CL	A-6 or A-7	Subangular blocky.	.8 to 2.5	2.0	5.6 to 6.0	Low to moderate.	Poor.
	36 to 48+	ML or CL	A-6	Structureless	.8 to 2.5	2.0	5.6 to 6.5	Low	Fair to good.
Forestdale silty clay loam, nearly level phase.	0 to 4	CL	A-6	Granular	.2 to .8	2.5	4.5 to 6.0	Moderate	Poor.
	4 to 26	CH	A-7	Subangular blocky.	.05 to .2	2.5	4.5 to 6.0	High	Not suitable.
	26 to 53	CL or CH	A-7	Subangular blocky to massive.	.2 to .8	2.5	4.5 to 6.0	Moderate to high.	Poor.
	53 to 72+	CL	A-6	Massive	.2 to .8	2.5	4.5 to 6.0	Moderate	Poor.
Forestdale silt loam, nearly level phase.	0 to 6	ML or CL	A-4 or A-6	Crumb	.8 to 2.5	2.2	5.6 to 6.0	Low	Fair to good.
	6 to 27	CH	A-7	Subangular blocky.	.05 to .2	2.2	4.5 to 5.0	High	Not suitable.
	27 to 54	CL or CH	A-7	Subangular blocky to massive.	.2 to .8	2.2	4.5 to 5.0	Moderate to high.	Poor.
	54 to 66+	CL	A-6 or A-7	Massive	.8 to 2.5	2.2	5.6 to 6.5	Low to moderate.	Fair.
Iberia clay	0 to 3	OH	A-7	Granular	.05 to .2	3.0	6.1 to 6.5	High	Not suitable.
	3 to 28	CH or OH	A-7	Massive to subangular blocky.	Less than .05	3.0	6.1 to 6.5	High	Not suitable.
	28 to 60+	CH	A-7	Massive	Less than .05	3.0	6.6 to 7.8	High	Not suitable.

[1] Available moisture-holding capacity is the amount of water that can be removed from a moist soil (at field capacity) by plants. The estimated data was adapted from an irrigation guide for the Delta Area of Mississippi, prepared in 1955 and revised in 1956 by the Soil Conservation Service, in collaboration with Mississippi State College, the Agricultural Extension Service, representatives of the Irrigation Equipment Industry, and others (*4*).

TABLE 5.—*Engineering test data* [1] *for*

Soil name and location	Parent material	Bureau of Public Roads Report No.	Depth	Horizon	Moisture-density	
					Maximum dry density	Optimum moisture
			Inches		*Lb. per cu. ft.*	*Percent*
Alligator clay: Center SW¼ sec. 33, T. 16 N., R. 4 W.	Alluvium	93211	0 to 3	A_p	91	23
		93212	3 to 30		92	25
		93213	30 to 55+		93	25
Dundee very fine sandy loam: NE¼NW¼ sec. 8, T. 15 N., R. 2 W.	Alluvium	93217	0 to 6	A_p	100	17
		93218	6 to 24	B_2	104	18
		93219	24 to 38		106	18
		93220	38 to 56		108	17
Forestdale silty clay loam: NW¼NW¼ sec. 2, T. 16 N., R. 5 W.	Alluvium	93214	0 to 4	A_p	108	16
		93215	4 to 26	B_2	100	22
		93216	26 to 53		105	17

[1] Test performed by Bureau of Public Roads in accordance with standard procedures of the American Association of State Highway Officials (A. A. S. H. O.).

[2] Mechanical analyses according to the American Association of State Highway Officials Designation: T 88. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the A. A. S. H. O. procedure, the fine material is analyzed by the hydrometer method, and the various grain-size

Soil Science Terminology

Some of the terms used by the agricultural soil scientist may be unfamiliar to the engineer, and some words—for example, soil, clay, silt, sand, aggregate, and granular—may have special meanings in soil science. These, and other special terms that are used in the soil survey report, are defined in the glossary.

Roads

Most of the main soil problems in design, construction, and maintenance of highways are caused by physical characteristics of soil materials and by drainage. In this county bedrock is at such great depths that it presents no problems in highway engineering.

The data in table 4 are useful in evaluating the soils for highways. The Alligator, Dowling, and Iberia soils shrink greatly on drying, and they swell on wetting. If subgrades made of these soils are too wet when the pavement is constructed, subsequent drying will shrink the soil and cause cracks in the overlying pavement. If the subgrade is too dry, absorption of moisture swells the soil and causes the pavement to warp. The cracking and warping of pavements laid over very plastic soils can be minimized if a thick layer of soil material that has low volume change is used as a foundation course beneath the pavement. The foundation course should extend through the road shoulder.

Table 4 shows the suitability of the various soils as sources of topsoil to aid in the revegetation of embankments, road shoulders, ditches, and cut slopes. Road shoulders that are intended to support only limited traffic preferably should be built of sandy loams or loamy sands.

Table 3 shows that many soils have ponded water or a shallow water table for significant periods each year. Roads on these soils should be constructed on embankment sections and provided with an adequate system of underdrains and surface drains. In lowlands and other areas that are flooded, roads should be constructed on a continuous embankment that is several feet above the level of frequent floods. The highly organic swampy soils provide a poor foundation for a road; hence these materials should be removed from the roadway section and replaced by a more stable material.

The natural levees are generally the best sites for roads because of good natural drainage of the soils. Some of the soils developed on natural levees have sandy material that provides a good foundation for pavements. The upper 6 inches of Dundee very fine sandy loam has been used as a surfacing for farm roads that have a very limited amount of traffic.

Soil Drainage and Building Sites

Water seeps faster from ponds, irrigation flumes, terraces, and similar excavations on soils of capability units 1 (I–1) and 2 (IIe–1) than on other soils of the county because they have more permeable and, in most places, sandier subsoils. The loss of water is often negligible, however, because particles of silt and clay settle and soon form a lining in the excavations. Only a small amount of water seeps from excavations in soils that have clayey subsoils.

soil samples taken from 3 soil profiles

Mechanical analyses [2]								Liquid limit	Plasticity index	Classification	
Percentage passing sieve—				Percentage smaller than—							
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			A. A. S. H. O.[3]	Unified [4]
----------	----------	100	99	91	76	63	52	71	40	A-7-5(20)	CH.
----------	----------	100	99	88	75	65	54	85	54	A-7-5(20)	CH.
----------	----------	100	99	85	69	61	50	94	64	A-7-5(20)	CH.
----------	----------	100	91	60	26	10	7	23	0	A-4(8)	ML.
----------	----------	100	96	82	56	37	31	42	20	A-7-6(12)	CL.
----------	----------	100	97	78	48	26	23	37	14	A-6(10)	ML-CL.
----------	----------	100	98	80	48	23	18	34	9	A-4(8)	ML-CL.
----------	----------	100	93	78	55	35	28	33	13	A-6(9)	CL.
----------	----------	100	97	86	68	50	45	63	38	A-7-6(20)	CH.
100	99	99	91	74	50	35	31	47	24	A-7-6(15)	CL.

fractions are calculated on the basis of all the material, including that coarser than 2 mm. in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 mm. in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes of soils.

[3] The Classification of Soils and Soil-Aggregate Mixtures for Highway Purposes, A. A. S. H. O. Designation: M 145-49 (*1*).

[4] The Unified Soil Classification System, Tech. Memo. No. 3-357, v. 1, Waterways Experiment Station, March 1953 (*10*).

The soils in capability units 1 (I-1) and 2 (IIe-1) are generally desirable for building sites because they have a fairly low content of clay and do not expand in wet seasons and contract in dry seasons as clayey soils do. They are—

Unit 1 (I-1)—

Dubbs very fine sandy loam, nearly level phase.
Dubbs silt loam.
Dundee silt loam, nearly level phase.
Dundee very fine sandy loam.
Dundee-Pearson silt loams.

Unit 2 (IIe-1)—

Dubbs very fine sandy loam, gently sloping phase.
Dundee silt loam, gently sloping phase.

The soils in capability units 4 (IIs-3) and 6 (IIs-6) are the next most desirable as locations for buildings. They are—

Unit 4 (IIs-3)—

Forestdale silt loam, nearly level phase.
Forestdale silt loam, nearly level moderately shallow phase.
Forestdale silt loam, gently sloping phase.
Forestdale very fine sandy loam, nearly level phase.
Forestdale very fine sandy loam, gently sloping phase.
Forestdale-Brittain silt loams.

Unit 6 (IIs-6)—

Dundee silty clay loam, nearly level phase.

The only soil in capability unit 16 (IVw-1)—Dowling clay—is the least desirable as a site for buildings because it has a clayey texture and occurs in low positions. Other soils that have a high or very high shrink-swell potential are not desirable as building sites.

Irrigation

Irrigation farming is a specialized type of farming that requires careful planning based on reliable information. Among other things, the farmer needs to know (1) how different kinds of soils take in, hold, and give up moisture; (2) how different kinds of plants use moisture; (3) how to apply water so as to best meet the needs of the soils and the plants growing on them; (4) the cost of supplying the water; (5) the probable increase in yield if the water is applied; and (6) the prices to be expected from the crops grown.

Farmers who plan to irrigate, or who have already installed an irrigation system, need detailed information that cannot be supplied in a soil survey report. They can obtain this from the local representative of the Soil Conservation Service or the county agent. Nevertheless, it seems worthwhile to point out in this report the pattern of rainfall, the results of some experiments on irrigation, and ways of estimating the amount of moisture in soils of various textures.

Pattern of rainfall

In this county the total annual rainfall normally exceeds the amount needed for best crop production, but most of it falls in winter when crops need the least moisture. Many days or even weeks during summer, the crops need far more moisture than the rainfall provides. Frequently, summer droughts are severe enough to reduce yields of pasture and row crops. In most years perennial pasture is severely affected by high temperatures and shortage of moisture from midsummer to late in summer.

Records of rainfall and crop needs for moisture are not available for Humphreys County, but the shortage of summer rainfall can be estimated from records at Stoneville, Miss., which has similar rainfall and equivalent need of moisture for plant growth. At Stoneville, August rainfall was less than the crops needed for 21 out of 22 years for the period 1930–51. During this period, the September rainfall was short of crop needs in 19 years; October rainfall, in 9; and November rainfall, in 2. For the same period, the May rainfall was short of crop needs in 2 years; the June rainfall, in 11; and the July rainfall, in 17 years.

Irrigation experiments

Irrigation experiments made in the period 1952–54 at the Delta branch of the Mississippi Agricultural Experiment Station in Washington County (*2*), west of Humphreys County, disclosed the following facts:

1. On sandy loam soils, during the 1952–54 period, irrigation increased the yields of seed cotton about 750 pounds an acre; corn, 26 bushels an acre; and soybeans, 8 bushels an acre.
2. On clay soils, irrigation increased yields of corn 30 bushels an acre; soybeans, 10 bushels an acre; and alfalfa, 1.5 tons an acre. In 1954, cotton yields did not increase under irrigation.
3. In 1954, irrigated pastures of dallisgrass, johnsongrass, and coastal bermudagrass added more than 300 pounds of weight per acre to beef cattle in the period from July 26 to November.
4. If cotton and corn have wilted severely, irrigation only slightly increases yields. Water, if it is to be of much value, must be applied before wilting.
5. Irrigating cotton on soils where a hardpan has developed is of little benefit unless measures are taken to correct or eliminate the hardpan.
6. Insects are more difficult to control if cotton is irrigated.
7. Irrigation makes control of grasses and weeds more difficult.
8. Irrigation has a permanent place in agriculture in the Yazoo-Mississippi Delta, as is indicated by the weather records and the crop-response data.

In judging the benefits and disadvantages of irrigation just listed, it should be recalled that yields of most nonirrigated crops were severely reduced by dry weather in 1952 and 1954, and that yields of many nonirrigated crops were reduced in 1953. Because the experiments were made in dry years, the comparative increases in yields resulting from irrigation are probably larger than they would be in years of average, or better, rainfall. However, as previously mentioned, there normally is a shortage of rainfall during the growing season.

Soil moisture supply[6]

Described in table 6 are the appearance and behavior of soils of several textures when they contain various percentages of moisture ranging from dry to above field capacity. This information will be useful to those who have installed irrigation systems or who are considering the possibility of irrigating their land.

Soil acts as a reservoir. During heavy rainfall, it absorbs and holds water for crop use in the dry periods. The water is held in the soil much as it is held in a sponge.

After a rain that thoroughly saturates the soil, some water will drain away, and the rest will be held in the soil against the pull of gravity. The amount of moisture held in the soil after such a rain is called *field capacity*.

To get water from the soil, plant roots must exert a force greater than the force that holds the water to the soil particles. The more water the plants withdraw, the greater the force they need to exert to obtain more water. Eventually, the point is reached where plant roots no longer exert enough force to pull the water from the soil, and then the plants wilt. This point is called the *permanent wilting percentage*.

The *available moisture capacity* of a soil is the difference between the amount held at field capacity and the amount that is held at the permanent wilting percentage.

The water-holding capacity of a soil is determined mainly by the size and arrangement of the soil particles. In general, the finer the soil particles and the stronger the slope, the more slowly the soil absorbs water. Because sandy soils have coarse particles, they absorb water rap-

[6] Parts of this section have been adapted from Miss. Farm Res., v. 18, No. 5 (*2*) and Miss. Agr. Expt. Sta. Bul. 531 (*3*).

TABLE 6.—*Behavior of soils of several textures at different moisture contents*

Soil	No moisture	Up to 50 percent field capacity	50 to 75 percent field capacity	75 percent to field capacity	Field capacity	Above field capacity
Sandy loam	Dry, loose, flows through fingers.	Appears dry; will not form a ball.[1]	Forms ball under pressure, but ball seldom holds together.	Forms weak ball that breaks easily; not slick or slippery.	If squeezed in hand, no free water, but wet imprint on hand.	Free water released if kneaded.
Loam and silt loam.	Dry, powdery; at times forms crusts that break into powder easily.	Somewhat crumbly but holds together under pressure.	Forms ball; somewhat plastic; at times is slick or slippery under pressure.	Forms ball; very plastic; feels slick or slippery if it contains much clay.	If squeezed in hand, no free water, but wet imprint on hand.	Free water can be squeezed out.
Clay loam and clay.	Hard crust that may be cracked; at times, loose crumbs on surface.	Somewhat plastic; ball forms under pressure; cracks appear in ball.	Forms ball; forms ribbon if pressed between fingers.	Forms ribbon easily; feels slick or slippery.	If squeezed in hand, no free water, but wet imprint on hand.	Puddles; free water on surface.

[1] Ball is formed by squeezing a handful of soil firmly.

idly, hold little of it, and quickly give up this small amount. Clay soils, in contrast, have very fine particles. Consequently, they soak up water slowly, hold a large amount, and give up this amount slowly. Clay soils still hold an appreciable amount of water after plants have wilted.

Soils best suited to irrigation are those that are nearly level and of intermediate texture. Soils that take in water slowly because of texture or slope, or both, are difficult to irrigate. Small amounts of water must be applied over long periods, and this increases the cost of irrigating. The intake of water can be improved for both fine- and coarse-textured soils by adding organic matter.

Soil Characteristics and Water Control

This subsection summarizes the soil characteristics most important in controlling water. The various rates of surface runoff and internal drainage are briefly defined. The soils are then listed, by capability groups, for various ranges in rate of surface runoff and internal drainage.

Surface runoff

The movement of water over the land is called surface runoff, or external drainage. The various rates of surface drainage used in this county are defined as follows:

Rapid Surface Runoff: A large part of the water that falls on the land runs off; only a small part moves down through the soil.

Medium Surface Runoff: A moderate amount of water flows away, and a moderate amount enters the soil; free water is on the surface for only short periods; loss of water through medium surface runoff does not seriously reduce the supply of water for plants.

Slow Surface Runoff: Water flows away so slowly that free water covers the soil for significant periods, passes through the soil profile, or evaporates into the air.

Very Slow Surface Runoff: Water flows away so very slowly that free water lies on the surface for long periods or immediately enters the soil. Much of the water either passes through the soil or evaporates.

Soils that have medium to moderately rapid runoff and moderate to severe erosion:

Capability unit 7 (IIIe–4)

Forestdale silt loam, moderately eroded sloping phase.

Soils that have slow runoff, and erosion, if any, is slight:

Capability unit 1 (I–1)

Dubbs silt loam.
Dubbs very fine sandy loam, nearly level phase.
Dundee silt loam, nearly level phase.
Dundee very fine sandy loam.
Dundee-Pearson silt loams.

Capability unit 4 (IIs–3)

Forestdale silt loam, nearly level phase.
Forestdale silt loam, nearly level moderately shallow phase.
Forestdale very fine sandy loam, nearly level phase.
Forestdale-Brittain silt loams.

Capability unit 5 (IIs–4)

Alligator silty clay loam, nearly level phase.
Forestdale silty clay loam, nearly level phase.
Forestdale silty clay loam, nearly level shallow phase.

Capability unit 6 (IIs–6)

Dundee silty clay loam, nearly level phase.

Capability unit 8 (IIIs–4)

Alligator clay, nearly level phase.
Forestdale silty clay, nearly level phase.
Iberia clay.

Soils that have medium runoff and slight to moderate erosion:

Capability unit 2 (IIe–1)

Dubbs very fine sandy loam, gently sloping phase.
Dundee silt loam, gently sloping phase.

Capability unit 3 (IIe–4)

Dundee silty clay loam, gently sloping phase.

Capability unit 4 (IIs–3)

Forestdale silt loam, gently sloping phase.
Forestdale very fine sandy loam, gently sloping phase.

Capability unit 5 (IIs–4)

Alligator silty clay loam, gently sloping phase.
Forestdale silty clay loam, gently sloping phase.

Capability unit 8 (IIIs–4)

Alligator clay, gently sloping phase.
Forestdale silty clay, gently sloping phase.

Soils that have very slow surface runoff and no erosion:

Capability unit 10 (IIIw–5)

Forestdale silty clay loam, level phase.

Capability unit 12 (IIIw–11)

Alligator clay, level phase.

Soils that are flooded most years for several days to several weeks, and that accumulate soil:

Capability unit 9 (IIIw–4)

Forestdale silt loam, nearly level overflow phase.

Capability unit 11 (IIIw–6)

Alligator silty clay loam, nearly level overflow phase.
Forestdale silty clay loam, nearly level overflow phase.
Forestdale silty clay loam, gently sloping overflow phase.

Capability unit 13 (IIIw–12)

Alligator clay, level overflow phase.
Alligator clay, nearly level overflow phase.
Alligator-Dowling clays, overflow phases.
Alligator, Dowling, and Forestdale soils, overflow phases.

Capability unit 14 (IIIw–13)

Dowling soils.

Capability unit 15 (IIIw–14)

Dowling soils, overflow phases.

Capability unit 16 (IVw–1)

Dowling clay.

Capability unit 17 (IVw–2)

Dowling clay, overflow phase.

Internal drainage

The movement of water through the soil is called internal drainage. The various rates of internal drainage used in this county are defined as follows:

Rapid Internal Drainage: Soil is saturated with water only a few hours, so movement of water is a little too rapid for the best growth of the important crops. The soil is free of mottles and has a brownish subsoil.

Medium Internal Drainage: Soil is saturated with water only a few days, or for too short a time to damage roots of crop plants; this is about the best internal drainage for growth of important crops; the subsoil is brownish and only slightly mottled, and the surface soil is free of mottling.

Slow Internal Drainage: Water moves through soil slowly enough to have an undesirable effect on growth of crops; water may saturate the root zone for periods of a week or two, or long enough to damage the roots of many crop plants; the subsoil is grayish and mottled to highly mottled.

Very Slow Internal Drainage: Water moves through the soil too slowly for best growth of crops; root zone may be saturated for a month or two; the subsoil is normally dark gray or gray and splotched or highly mottled.

Soils of Humphreys County

Shown on the large soil map at the back of this report are 40 different soils and 1 miscellaneous land type, called Swamp. To understand these soils readily, it is helpful to group them so that their similarities and differences can be understood and remembered. Therefore, in this section, the soils of the county are first discussed as they occur in geographic patterns on broad tracts of land. A colored soil map at the back of the report shows these patterns, or soil associations. After the discussion of general soil patterns, or areas, the soil series—groups of single soils basically alike—are named as they occur on old natural levees, in slack-water areas, and in depressions. Finally, the series and each of the 40 soils are described in alphabetical order.

Soil Associations

The map showing general soil areas, or soil associations, at the back of this report shows the kinds of soils in Humphreys County. This map is helpful in studying the soils of the county in general or for broad program planning. It is not sufficiently detailed to be useful in studying the soils of a farm.

Each association contains several different kinds of soils arranged in a characteristic pattern. The pattern is related to the nature of the soil materials and, in most places, to the shape of the land surface.

The soil association map of Humphreys County gives a good picture of the broad distribution of the following soils:

1. Nearly level and gently sloping soils on old natural levees and depressions: Forestdale-Dundee-Dubbs-Dowling.
2. Nearly level soils on old natural levees: Forestdale-Dundee-Brittain-Pearson.
3. Nearly level and level soils between slack-water flats and old natural levees or on low ridges: Alligator-Forestdale-Dowling.
4. Level, nearly level, or gently sloping soils subject to annual overflow: Alligator-Dowling-Forestdale.

Soil association 1

Nearly level and gently sloping soils on old natural levees and depressions: Forestdale-Dundee-Dubbs-Dowling

These soils have formed from fine- to medium-textured, stratified alluvium washed in by the Mississippi River. The parent material of the Dowling soils also includes some local alluvium washed or sloughed down from higher lying soils. The surface layers are chiefly silt loams, silty clay loams, and very fine sandy loams. These soils make up about 18 percent of the county area.

The Forestdale soils, on the lowest part of the old natural levees, make up a large part of the association. The Dundee soils, which occur at higher elevations than the Forestdale, occupy the next largest acreage. The Dubbs soils, the least extensive of the soils in the association, and some included areas of Bosket soils, occur at the highest elevations. The Dowling soils occupy a small acreage in the depressions.

The Forestdale soils are poorly drained to somewhat poorly drained; the Dundee are somewhat poorly drained to moderately well drained; the Dubbs are moderately well drained to well drained; and the Dowling are poorly drained. The Forestdale soils require drainage for good yields, and the Dowling soils require drainage if they are to be cultivated.

Except for the Dowling, all of the soils in this association have been free from overflow long enough to have become leached to some extent. The soils are slightly acid to very strongly acid and have a low content of organic matter. Most of them are only slightly eroded, but in some small areas they are moderately eroded.

The Dubbs and Dundee soils are considered the best agricultural soils in the county. Most of the soils in this association have been cleared, however, and are used to grow row crops.

Soil association 2

Nearly level soils on old natural levees: Forestdale-Dundee-Brittain-Pearson

The soils of this association occur in a mixed pattern on the nearly level old natural levees. They occur along Silver Creek and Straight Bayou in the southwestern part of the county and occupy about 6 percent of the county area.

The soils of this association are mainly silt loams. The Forestdale and Dundee soils have formed from mixed sand, silt, and clay. The Brittain and Pearson soils have formed mainly from silty material.

The Forestdale and Brittain soils occupy the largest acreage of any of the soils of the group. They are poorly drained to somewhat poorly drained and occur on the lower elevations of the old natural levees. The Dundee and Pearson soils, which are somewhat poorly drained to moderately well drained, occur at higher elevations on the old natural levees. A few areas of the moderately well drained to well drained Dubbs soils also occur at these higher elevations. The Dowling soils, which are poorly drained silty clay loams and silt loams, occur in the narrow depressions that are scattered throughout the association. The Forestdale and Brittain soils require surface drainage for good yields, and the Dowling generally require surface drainage before they can be cultivated.

Except for the soils in depressions, all of these soils have been free from overflow long enough to have become leached to some extent. The soils are medium acid to very strongly acid and have a low content of organic matter. Most of them are only slightly eroded.

Most of this association has been cleared and is used mainly for row crops. A small acreage is used to grow grasses and legumes. The Dundee, Pearson, and Dubbs soils are well suited to most of the commonly grown row crops and to pasture.

Soil association 3

Nearly level and level soils between slack-water flats and old natural levees or on low ridges: Alligator-Forestdale-Dowling

The soils of this association have formed from clayey sediments deposited by the Mississippi River. They are generally nearly level or level, but in a small acreage the relief is gently sloping. The soils of this group occupy about 56 percent of the county.

Poorly drained Alligator clays and Alligator silty clay loams; poorly drained and somewhat poorly drained Forestdale silty clays and Forestdale silty clay loams; and a few small areas of poorly drained Iberia clay occupy the largest acreage of the soils in this group. The Dowling clays, which are poorly drained to very poorly drained, occur in the depressions. Most of the soils require extensive surface drainage before crops can make good yields.

The soils generally have not been free from overflow as long as the soils of association 1. They have had less time to develop distinct differences between horizons. The soils range from slightly acid to very strongly acid, but most are strongly acid. There has been only slight erosion.

Rice, mixtures of grasses and legumes, oats, and some row crops grow well on the soils of this association. The soils are also suited to trees.

Soil association 4

Level, nearly level, or gently sloping soils subject to annual overflow: Alligator-Dowling-Forestdale

The soils of this association occur on the flood plains of the Yazoo and Big Sunflower Rivers and their tributaries. Some of the soils were formed from alluvium that consisted largely of clay, but others were formed from mixed sand, silt, and clay. The association occupies about 20 percent of the county.

The Alligator clays and Alligator silty clay loams make up the largest acreage of the soils in this association. They are poorly drained and generally occur in broad, level areas. Poorly drained to somewhat poorly drained Forestdale silty clays, Forestdale silty clay loams, and Forestdale silt loams occur at higher elevations. The Dowling soils, which are very poorly drained, occupy the depressions.

These soils are subject to flooding most years and are often under water for several weeks. The floods deposit new material each year, and there is no erosion. The soils are medium acid to very strongly acid. Uncleared areas are covered with a matted layer of partly decomposed litter from deciduous trees.

Most of this association is in forest, which is probably its best use. A small acreage is used for row crops and for mixtures of grasses and legumes.

Soil Series and Their Relations

Sediments from the Mississippi River and other streams have given rise to the soils of Humphreys County. The county is on the Mississippi River flood plain, which is made up of several coalescing deltas that have been building up during the last few thousand years. The deltas were formed when the swift waters of the Mississippi River flowed into the sea that once covered this area. Other overflowing streams have added more sediments.

When the streams overflow, the heaviest soil particles, sand and other coarse materials, are deposited first. The coarse materials form the sandy natural levees closest to the stream. These levees are normally higher than the surrounding flood plain. Small particles, as silt, drop out when the water slows down with increasing distance from the channel. This silty deposit forms the lower part of the natural levees. Clay particles, the smallest and lightest in the river sediments, are carried the longest distance and dropped in quiet waters. Thus, clay and silty clay occur in the large slack-water areas of this county.

The deposit of sediments is not uniform, because the speed of the sediment-laden water varies. At different times, unlike soil materials are deposited in the same given area. Generally, however, coarse soils are on old natural levees or ridges near the streams, finer soils are on the lower slopes back from the streams, and fine clays are on the nearly level slack-water areas farthest from the streams (fig. 3).

The cutting of new stream channels also complicates the pattern of soils. The natural levees and the stream bed are gradually built higher than the backswamps and surrounding flood plain. Then, when the river floods again, it may break out of its channel and cut a new course on the lower levels of the flood plain. Thus, through long periods of time, a broad river valley such as the Mississippi becomes cut up by many old abandoned river channels.

The soils in the county were derived from many different sources, so they vary greatly. They range from very strongly acid to slightly acid in reaction, from low to medium in content of organic matter, and from fairly low to very high in exchangeable bases. Their surface layers range from clay to sandy loam. Most of the soils are moderate to high in natural fertility, compared with the soils of the United States as a whole. More than 70 percent of the soils, however, have physical characteristics that limit the production of some crops. In some areas, in the western half of the county, alkaline layers (pH 7.5 to 8) occur at depths of 40 inches or more.

The series of this county are in three groups: (1) Soils of the old natural levees, (2) soils of the slack-water areas, and (3) soils of the depressions. A brief description of these groups is given in the following pages. The series are described in the section, Descriptions of Soils, and their characteristics are summarized in the supplement to the soil map at the back of this report.

Soils of the old natural levees

These soils were formed from sediments deposited by the fast-moving floodwaters of the Mississippi River. They occur on old natural levees that are adjacent to rivers and bayous or along former stream runs or old lakes, swamps, and depressions. They have been free from seepwater and flooding long enough that there has been

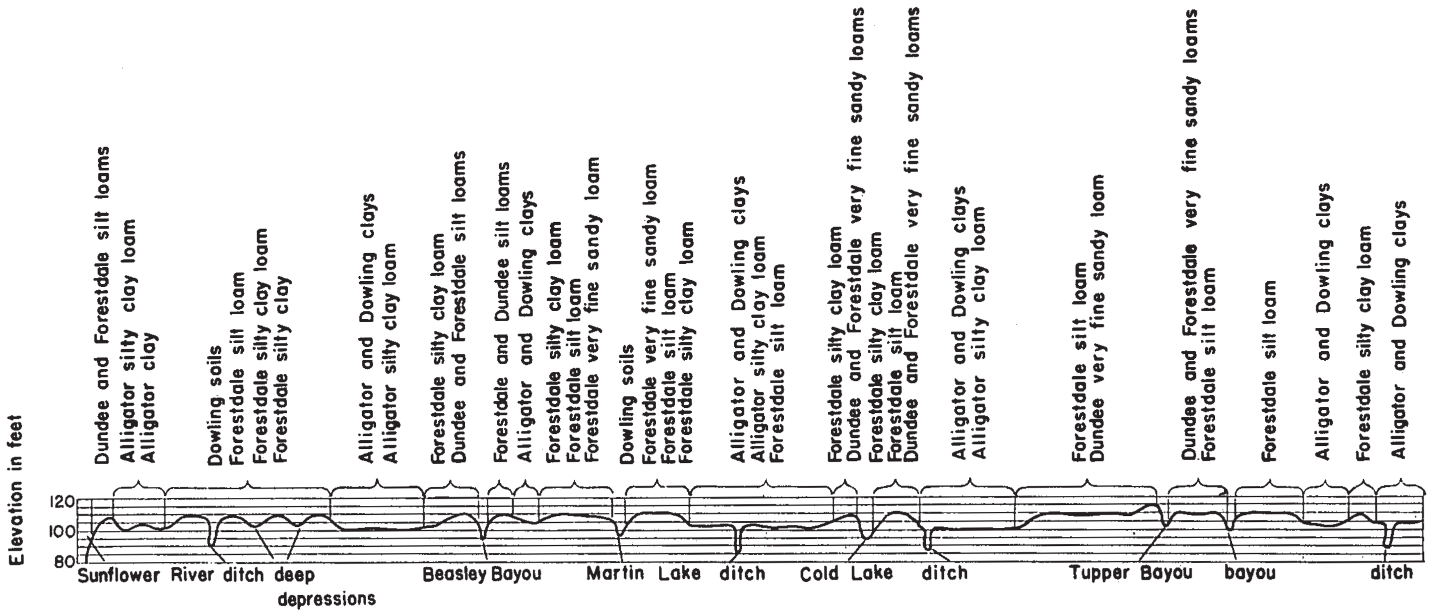


Figure 3.—**Northwest-southeast cross section showing relation**

some leaching, and the profiles show some horizon differentiation. Except for a few soils that were formed mostly from silty alluvium, the soils were formed from fine to moderately coarse textured, stratified alluvium. The soils formed from silty alluvium occur in small areas along Silver Creek and Straight Bayou in the southwestern part of the county.

The soils of the old natural levees are in five soil series—the Brittain, Dubbs, Dundee, Forestdale, and Pearson. Drainage ranges from moderately good to good in the Dubbs soils to poor to somewhat poor in the Forestdale. These soils make up about 33 percent of the acreage in the county.

Soils of the slack-water areas

These soils were derived mainly from clayey alluvium. As sediment-laden streams overflow into areas of slack water, they are slowed down, and the fine-textured clayey sediments drop out of suspension. In this way alluvium is built up. The soils thus formed have poor drainage, and some are still flooded at times. These soils have less profile development than the soils of the old natural levees.

In this group of poorly drained soils are the Alligator; the Iberia; a complex—Alligator-Dowling clays, overflow phases; and an undifferentiated soil group—Alligator, Dowling, and Forestdale soils, overflow phases. These are described in the section, Descriptions of Soils.

Soils of the depressions

The soils of the depressions were formed in part from alluvium that was washed down from higher surrounding soils and in part from alluvium washed in by the Mississippi River. They are excessively moist and are flooded much of the time. Their surface layers range from clay to silt loam.

These soils are in low depressions that are a part of the natural drainage pattern. They can be used to advantage as a location for secondary and primary drainage ditches.

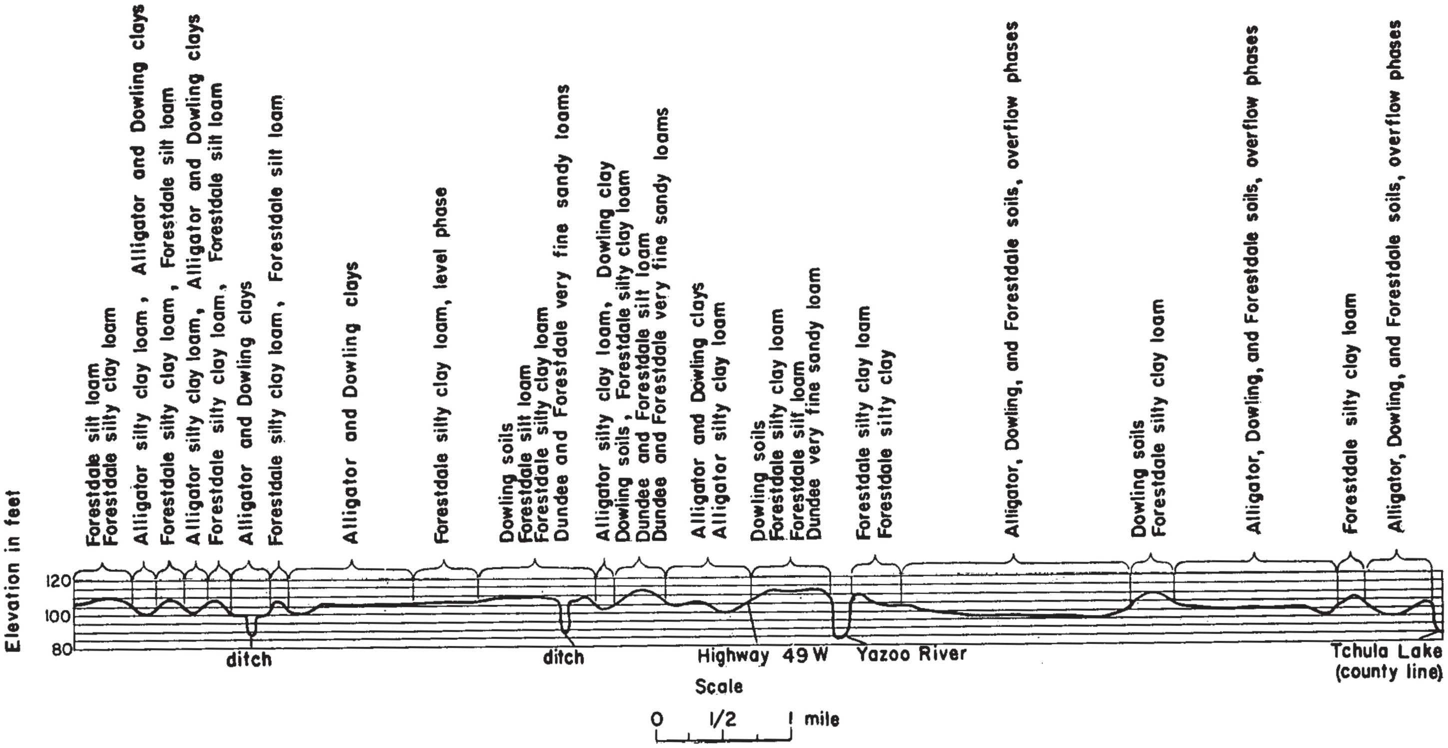
The only soils of the depressions in this county are the Dowling, but Swamp, a miscellaneous land type, also occurs in depressed areas at the bottom of lakebeds or in beds of former streams. The soils of depressions make up about 15 percent of the total county area.

Descriptions of Soils

This subsection is provided for those who want detailed information about soils. It describes the single soils, or mapping units, in the county; that is, the areas on the detailed soil map that are bounded by lines and identified by a letter symbol. For more generalized information about soils, the reader can refer to the subsection, Soil Series and Their Relations, in which groups of soils basically alike are discussed, or to the subsection, Soil Associations, in which the broad patterns of soils are explained.

In this subsection the soils are described in approximately alphabetic order. All the soils of one series that have the same texture in the surface layer are together. For example, all the Alligator soils that have a clay surface soil come together, and then, all of the Alligator soils that have a silty clay loam surface soil.

In each series one soil is described in detail for each kind of surface soil texture. An important part of the description of the soil is the soil profile, a record of what the soil surveyor saw and learned when he dug into the ground. For each soil the slope, erosion, and similar properties that distinguish it from the other soils are pointed out. Frequently, the characteristics emphasized for a single soil are those that directly affect its management. For example, there are five soils in the Alligator



of soils and topography in Humphreys County, Miss.

series that have a clay surface layer and are similar in profile, but these five are different in slope or drainage, either of which affects management.

The location and distribution of the single soils are shown on the soil map at the back of this report. Their approximate acreage and proportionate extent are given in table 7. It will be helpful to refer to the section, Soil Survey Methods and Definitions, where "series," "type," "phase," and other special terms used in describing soils are listed. Many other words and terms are defined in the glossary at the back of this report.

Alligator series

The Alligator series consists of slowly permeable, very plastic, poorly drained, clayey soils. The grayish-brown to dark-gray surface layers are underlain by highly mottled grayish clay. The soils were derived from alluvium of fine texture that was washed in by the Mississippi River and deposited in slack-water areas throughout the county. Locally, these soils are called gumbo or buckshot land. They are slightly acid to very strongly acid and occur in association with the Dowling and Forestdale soils. They are lighter colored in the upper part of the profile than the Dowling soils, do not occur in depressions, and normally are slightly more acid. They generally occur at lower elevations than the Forestdale soils, have finer textured profiles, and have less distinct profile development.

Alligator clay, nearly level phase (½ to 2 percent slopes) (Ac).—This is a poorly drained, slightly acid to very strongly acid soil of the slack-water areas. It has slow surface runoff and very slow to slow internal drainage. It has only slight erosion or none at all. This is the predominant soil in the county.

Profile from a moist, cultivated field (SW¼SW¼ sec. 33, 16 N., R. 4 W.):

0 to 3 inches, dark grayish-brown (10YR 4/2) granular clay; very plastic, very firm, very hard; medium acid to strongly acid; layer ranges from dark gray to grayish brown in color and from 2 to 4 inches in thickness.

3 to 30 inches, gray (10YR 6/1 to 5/1) clay that has many medium and coarse, prominent, brownish-yellow and yellowish-brown (10YR 6/8, 5/6, and 5/4) mottles; very plastic, very firm, very hard to extremely hard; massive when wet, weak and moderate medium subangular blocky structure when dry; strongly acid to very strongly acid; layer ranges from 21 to 32 inches in thickness.

30 to 60 inches +, gray (10YR 5/1) clay with common, fine and medium, distinct, brownish-yellow and yellowish-brown (10YR 6/8, 5/6, and 5/4) mottles; very plastic, very firm, very hard to extremely hard; massive, strongly acid to slightly acid; mottling ranges from faint to distinct.

The clay and silty clay textures in the surface layer were not separated in mapping, so fairly large areas of Alligator silty clay are included in this soil.

In undisturbed woodlands the surface layer of this soil is often covered with loose leaves that are underlain by a layer, ½ to 2 inches thick, of partly decomposed litter from deciduous trees.

Use suitability.—The use of the soil depends largely on the weather. Normally, the soil can be cultivated properly for only a short period, as it is too plastic and sticky when wet and too hard when dry. Deep, wide cracks develop during long dry seasons. Ridged places or uneven areas next to small bayous are more suited to row crops than large, uniformly level areas.

When first cleared the soil has a fairly high content of organic matter, but this decreases rather rapidly. Nitrogen fertilizer must be added for best yields, and organic matter should be added when feasible. Drainage is a problem. All the common crops are grown, but rice, pasture, hay, and soybeans are the best suited. This soil is in capability unit 8 (IIIs–4).

Alligator clay, level phase (0 to ½ percent slopes) (Aa).—This soil is similar to Alligator clay, nearly level phase, except that it has even less slope.

Use suitability.—This soil must have extensive surface

TABLE 7.—*Approximate acreage and proportionate extent of the soils mapped*

Soil	Acres	Percent	Soil	Acres	Percent
Alligator clay:			Dundee very fine sandy loam	4, 943	2. 0
Level phase	16, 016	6. 1	Dundee-Pearson silt loams	2, 268	1. 0
Nearly level phase	68, 045	25. 7	Forestdale silty clay:		
Level overflow phase	1, 586	. 6	Nearly level phase	5, 275	2. 0
Nearly level overflow phase	5, 247	2. 0	Gently sloping phase	530	. 2
Gently sloping phase	1, 546	. 6	Forestdale silty clay loam:		
Alligator silty clay loam:			Level phase	1, 017	. 4
Nearly level phase	9, 594	3. 6	Nearly level phase	24, 008	9. 1
Nearly level overflow phase	1, 495	. 6	Nearly level overflow phase	2, 679	1. 0
Gently sloping phase	224	. 1	Nearly level shallow phase	893	. 3
Alligator-Dowling clays, overflow phases	11, 056	4. 2	Gently sloping phase	1, 943	. 7
Alligator, Dowling, and Forestdale soils, overflow phases	20, 398	7. 7	Gently sloping overflow phase	1, 291	. 5
Dowling clay	21, 914	8. 3	Forestdale silt loam:		
Dowling clay, overflow phase	6, 317	2. 4	Nearly level phase	12, 857	5. 0
Dowling soils	8, 378	3. 2	Nearly level overflow phase	747	. 3
Dowling soils, overflow phases	1, 420	. 5	Nearly level moderately shallow phase	1, 353	. 5
Dubbs silt loam	394	. 2	Gently sloping phase	2, 116	. 8
Dubbs very fine sandy loam:			Moderately eroded sloping phase	235	. 1
Nearly level phase	1, 480	. 6	Forestdale very fine sandy loam:		
Gently sloping phase	572	. 2	Nearly level phase	5, 539	2. 1
Dundee silty clay loam:			Gently sloping phase	490	. 2
Nearly level phase	692	. 3	Forestdale-Brittain silt loams	6, 005	2. 3
Gently sloping phase	389	. 2	Iberia clay	270	. 1
Dundee silt loam:			Swamp	2, 871	1. 1
Nearly level phase	5, 087	2. 0	Total	262, 400	100. 0
Gently sloping phase	3, 220	1. 2			

drainage if row crops are to be grown. It is in capability unit 12 (IIIw-11).

Alligator clay, gently sloping phase (2 to 5 percent slopes) (Ae).—This soil differs from Alligator clay, nearly level phase, mostly because it occurs in narrow bands in small areas on stronger and more varied slopes, has faster runoff, and contains some moderately eroded spots. In some years small spots are flooded by backwaters.

Use suitability.—Management that includes contour tillage, rotation of row crops with close-growing crops, and the use of permanent cover should be practiced to control erosion. This soil is in capability unit 8 (IIIs-4).

Alligator clay, nearly level overflow phase (½ to 2 percent slopes) (Ad).—The profile of this soil is similar to that of Alligator clay, nearly level phase, but this soil is normally more acid and is flooded for long periods, often for several months during the year. It occurs mostly in the eastern half of the county. The soil receives deposits from other soils.

Profile from a moist, wooded area:

3 to 0 inches, loose leaves underlain by a matted dark-brown (7.5YR 4/2 to 3/2) layer of partly decomposed litter from deciduous trees; 2 to 3 inches thick; very strongly acid.

0 to 4 inches, gray (10YR 6/1) clay that has many, medium, distinct to prominent, yellowish-brown (10YR 5/6 to 5/8) mottles; very plastic, very firm, very hard to extremely hard; massive; very strongly acid.

4 to 27 inches, gray (10YR 6/1) clay that has many, coarse, prominent, brownish-yellow (10YR 6/6 and 6/8) mottles; very plastic, very firm, very hard to extremely hard; massive when wet, weak and moderate, medium subangular blocky structure when dry; strongly acid.

27 to 50 inches +, gray (10YR 5/1) clay that has a few, medium, faint, yellowish-brown (10YR 5/8) mottles; very plastic, very firm, very hard to extremely hard; massive; medium acid.

Use suitability.—This soil is seldom free of floodwater in time to plant cotton, corn, or similar crops. Much of it is still in forest. This soil is in capability unit 13 (IIIw-12).

Alligator clay, level overflow phase (0 to ½ percent slopes) (Ab).—This soil differs from Alligator clay, nearly level overflow phase, because it occurs in level areas, is normally flooded to greater depths, and is flooded for longer periods. This soil is in capability unit 13 (IIIw-12).

Alligator silty clay loam, nearly level phase (½ to 2 percent slopes) (Ag).—This soil differs from Alligator clay, nearly level phase, in having a slightly thicker surface layer that contains more silt and less clay. It is therefore easier to till and is not so likely to crack in dry weather.

Like the nearly level phase of Forestdale silty clay loam, this soil has a highly mottled, grayish, fine-textured subsoil. The two soils are close together in areas transitional between the normal Alligator clays and the normal Forestdale silt loams.

This soil differs from Forestdale silty clay loam, nearly level phase, in having a fine-textured subsurface layer (normally clay) that is more than 30 inches deep. The Forestdale soil ordinarily has a silty clay subsurface layer, stratified with layers of silty clay loam or sandy clay loam, that is less than 30 inches deep. Also, the Forestdale subsurface layer contains more sand and mottles that are more brownish.

Included with Alligator silty clay loam, nearly level phase, are a few small areas that have a silty clay surface layer and a few areas that have slopes of less than ½ percent.

Profile from a moist, cultivated field (NE¼NE¼ sec. 22, T. 16 N., R. 4 W.):

0 to 4 inches, grayish-brown (10YR 5/2) silty clay loam; plastic, firm, hard; very strongly acid.

4 to 36 inches, light brownish-gray (10YR 6/2) clay that has common, medium, prominent, brown and yellowish-brown

(10YR 5/3 and 5/6) mottles; very plastic, very firm, very hard to extremely hard; massive when wet, weak and moderate medium subangular blocky structure when dry; very strongly acid to strongly acid; layer gray in some places.

36 to 72 inches +, gray (10YR 5/1) clay that has common, medium, prominent, dark-brown (10YR 4/3) mottles; very plastic, very firm, very hard to extremely hard; massive; alkaline to medium acid, and acidity increases with depth.

Use suitability.—The crops suited to this soil are rice, pasture, hay, and soybeans, as on Alligator clay, nearly level phase. Cotton, however, yields slightly more and is more reliable on this soil than on Alligator clay, nearly level phase. Nitrogen fertilizer should be added, and some surface drainage should be provided for cotton, corn, or market vegetables. This soil is in capability unit 5 (IIs–4).

Alligator silty clay loam, gently sloping phase (2 to 5 percent slopes) (Ak).—This widely distributed soil differs from Alligator silty clay loam, nearly level phase, mostly because it occurs in narrow strips on stronger and more varied slopes. It therefore has faster surface runoff and a few spots that are moderately eroded.

Use suitability.—Contour tillage, use of close-growing crops in the rotation, maintaining permanent cover, and similar good management practices are needed to control erosion. This soil is in capability unit 5 (IIs–4).

Alligator silty clay loam, nearly level overflow phase (½ to 2 percent slopes) (Ah).—This soil is similar to Alligator silty clay loam, nearly level phase, except that it is covered by backwaters for long periods, often several months a year. Undisturbed wooded areas of this soil are covered with a matted 2- to 3-inch layer of partly decomposed litter from deciduous trees.

Use suitability.—The overflow water often does not recede in time to plant cotton and similar crops. This soil is in capability unit 11 (IIIw–6).

Alligator-Dowling clays, overflow phases (0 to 1 percent slopes) (Am).—This soil complex consists of Alligator and Dowling clays that occur in an intricate pattern in flooded areas. When the Yazoo River overflows, it backs up into bayou-type tributaries; they, in turn, overflow and flood large areas in the eastern half of Humphreys County. These areas are flooded for long periods, often several months a year. Alligator soils make up 65 to 85 percent of the complex, and Dowling soils make up the rest. These soils are not eroded; instead, new soil is deposited on it.

Modal profiles of Alligator clay, nearly level overflow phase, and of Dowling clay are described in the report under those soil names.

Use suitability.—These soils are best used for forest and wildlife until the hazard of floods has been eliminated. They are in capability unit 13 (IIIw–12).

Alligator, Dowling, and Forestdale soils, overflow phases (0 to 2 percent slopes) (An).—This undifferentiated soil group consists of the overflow phases of the following soil types: Alligator clay, Alligator silty clay loam, Dowling clay, Dowling soils, Forestdale silty clay loam, and Forestdale silt loam. The Yazoo River overflows its banks in many years. When the river flows into bayou-type tributaries, they, in turn, overflow, and large wooded areas in the eastern half of the county are covered with water for long periods, often for several months a year.

In this mapping unit, the pattern of soils varies according to location. In areas flooded by tributaries of the Yazoo River rather than by the river itself—Wasp Lake, for example—the most extensive soils are of the Alligator series, especially Alligator clay. The Forestdale soils are confined to the few, long, narrow, low, natural levees that developed next to and along the tributaries and deeper depressions. In the wooded areas flooded by the Yazoo River itself, the Forestdale soils, mostly Forestdale silty clays and Forestdale silty clay loams, are the most extensive. A fairly large acreage of Alligator soils occurs in this last-named location. Dowling soils are in the depressions that are scattered among the larger areas of Forestdale soils.

The Dowling clays and Dowling soils occur in the long, narrow depressions. They are usually the first soils to be flooded and are always the last to be drained of floodwater. In contrast, because the Forestdale soils commonly are at higher altitudes, they are usually the last to be flooded and the first to be drained.

The soils of this mapping unit are similar to the corresponding cultivated soils that do not overflow, except that they are normally more acid and are covered with a matted layer, 2 to 4 inches thick, of partly decomposed litter from deciduous trees.

Use suitability.—Forest and wildlife are the best uses for these soils until the hazard of flooding has been eliminated. This group of soils is in capability unit 13 (IIIw–12).

Dowling series

The Dowling series consists of very plastic, very poorly drained and poorly drained soils. The very dark gray to gray surface layers are underlain by mottled, dark-gray to gray clayey subsoils. These soils have formed partly from alluvium washed into the slack-water areas by the Mississippi River and partly from alluvium washed and sloughed down from nearby higher land. They are slightly acid to strongly acid and occur in depressions of the Mississippi River flood plain in association with Alligator, Iberia, and Forestdale soils. Because of their very slow drainage and low position, these soils are flooded from a short time to a fairly long time after rains. Extensive surface drainage is generally needed.

Dowling clay (Da).—This poorly drained to very poorly drained, slightly acid to strongly acid soil occurs in depressions. It has very slow surface runoff and internal drainage, and it may be ponded. This soil is not eroded; instead, new soil is deposited on it. Areas of Dowling clay are well distributed throughout parts of the county occupied by the Alligator and Iberia soils and the finer textured Forestdale soils.

Profile from a moist, cultivated area (SW¼SW¼ sec. 33, T. 16 N., R. 4 W.):

0 to 3 inches, very dark gray (10YR 3/1) granular clay; very plastic, very firm, very hard; slightly acid to medium acid; layer ranges from very dark gray to gray in color and from 2 to 5 inches in thickness.

3 to 10 inches, dark-gray (10YR 4/1) clay with some fine, faint to distinct, yellowish-brown (10YR 5/6) mottles; very plastic, very firm, very hard to extremely hard; massive when wet, weak subangular blocky when dry; slightly acid to medium acid; layer appears bluish gray and ranges from 7 to 22 inches in thickness.

10 to 50 inches +, gray (10YR 5/1 to 6/1) clay with common, fine and medium, distinct, yellowish-brown, dark yellowish-brown, and very dark brown (10YR 5/8, 4/4, and 2/2) mottles; very plastic, very firm, very hard to extremely hard; massive; slightly acid.

Fairly large areas of this soil have a silty clay surface soil.

Use suitability.—The clay surface layer, poor drainage (fig. 4), and low position make this soil difficult to cultivate, and crop yields are uncertain. Wide and deep cracks occur during dry weather. These low areas, or depressions, are a part of the natural drainage pattern and can be used to advantage as a location for secondary and primary drainage ditches. This soil is in capability unit 16 (IVw–1).

***Figure 4.*—After heavy rains, water accumulates in depressions on Dowling clay. This soil can be used to advantage as a location for drainage ditches.**

Dowling clay, overflow phase (Db).—The profile of this soil is similar to that of Dowling clay, but it is more acid and is flooded for long periods, often for several months during the year. It is scattered throughout the county.

Use suitability.—This soil is seldom free of water in time to plant cotton, corn, or similar row crops. Forest and wildlife are probably the best uses for this soil. It is in capability unit 17 (IVw–2).

Dowling soils (Dc).—This group of soils has a dark-gray to light brownish-gray surface layer of silt loam to clay, 3 or more inches thick. The soils were formed partly from materials deposited by the overflow of the Mississippi River and partly from alluvium that washed and sloughed down from nearby silty and sandy soils. They occur in depressions within areas occupied by Dubbs and Dundee soils and the coarser textured Forestdale soils. They are similar to Dowling clay, but they have coarser surface layers. A few small areas that are similar to the somewhat poorly drained Souva silty clay loams and Souva silt loams are included.

Use suitability.—These low spots that receive deposits of alluvium from higher land are normally some of the most fertile in the field. But poor drainage and low position make yields of row crops uncertain. These depressions are part of the natural drainage pattern and can be used to advantage as locations for secondary and primary drainage ditches. This group of soils is in capability unit 14 (IIIw–13).

Dowling soils, overflow phases (Dd).—These soils are similar to Dowling clay, overflow phase, but they have surface soils that range from silt loam to clay. These soils are in the eastern half of Humphreys County. They are in capability unit 15 (IIIw–14).

Dubbs series

The Dubbs series consists of deep, moderately well drained to well drained, productive soils. They are moderately permeable and slightly acid to very strongly acid. The very friable, grayish-brown to pale-brown surface layer is underlain by a faintly or very faintly mottled, dark-brown to yellowish-brown subsoil. These soils of medium fertility normally have moderately developed profiles. They were formed on old natural levees from stratified, moderately fine to moderately coarse alluvium washed in by the Mississippi River. They are better drained but less extensive than the Dundee and Forestdale soils.

The Dubbs soils differ from the Dundee because they occur at slightly higher elevations, and they have a browner, slightly coarser textured, less mottled profile. The Dubbs soils were formed from coarser alluvium at higher elevations, so they have much better drainage than the Dundee. The Dubbs soils are faintly mottled in the subsoil, whereas the Forestdale have a grayish, mottled subsoil.

Included in the Dubbs series is 175 acres of Bosket very fine sandy loam, which occurs mostly near Sky Lake. These Bosket areas were included with the Dubbs very fine sandy loams. The Bosket soils are coarser textured and less mottled than the Dubbs and are well drained.

Dubbs very fine sandy loam, nearly level phase (½ to 2 percent slopes) (Dg).—This moderately well drained to well drained, slightly acid to very strongly acid soil of the old natural levees has slow surface runoff and medium internal drainage. It has been only slightly eroded.

Profile from a moist, cultivated field (SW¼SW¼ sec. 11, T. 16 N., R. 3 W.):

0 to 7 inches, pale-brown (10YR 6/3, dry) very fine sandy loam; very friable; medium acid; layer may be a loam, grayish brown to pale brown, and 5 to 8 inches thick.

7 to 18 inches, dark-brown and yellowish-brown (10YR 4/3 and 5/4) silty clay to silty clay loam without mottling; plastic, firm, hard; strong medium subangular blocky; very strongly acid; layer ranges from silty clay to clay loam, from dark brown to yellowish brown, from 8 to 16 inches in thickness, from slightly mottled to free of mottles, and from moderate to strong subangular and angular blocky.

18 to 25 inches, yellowish-brown (10YR 5/4 and 5/6) silty clay loam without mottling; moderately plastic, firm, hard; moderate medium subangular blocky; very strongly acid; layer ranges from silty clay loam to loam, from brown to yellowish brown, from free of mottles to slightly mottled, and from weak to moderate subangular blocky.

25 to 60 inches +, light yellowish-brown to yellowish-brown (10YR 6/4 to 5/4) silt loam to loam that has a few to common, fine to medium, faint, very pale brown (10YR 7/3 to 7/4) mottles; friable to very friable; strongly acid; layer ranges from silty clay loam to sandy loam, from grayish brown to light yellowish brown, and from weak subangular blocky to structureless.

Included in areas of this soil is 118 acres of Bosket very fine sandy loam, which is located mainly near Sky Lake.

Use suitability.—This soil has been cleared and is used mainly for crops, chiefly cotton (fig. 5). Nitrogen fertilizer and organic matter are needed for highest yields of cotton, corn, oats, or truck crops. Little, if any, drainage

Figure 5.—Cotton on field of Dubbs very fine sandy loam, nearly level phase, that has been crossplowed. Mechanized plowing is suited to the large level areas of fairly uniform soil, and it does not decrease the cotton yield.

is needed. This is one of the best soils in the county because it is easy to till, is moderately permeable to water and air, and produces high yields. It is an excellent soil for homesites, gardens, and orchards. It is in capability unit 1 (I–1).

Dubbs very fine sandy loam, gently sloping phase (2 to 5 percent slopes) (Dh).—This soil differs from Dubbs very fine sandy loam, nearly level phase, because it has slightly thinner and more varied profile layers and occurs in narrow, fairly short bands or strips on stronger and more varied slopes. The stronger slopes increase surface runoff so that, in places, small areas are moderately eroded. Areas of this soil include small tracts of Dubbs silt loam and Bosket very fine sandy loam.

Use suitability.—Good management, including use of close-growing crops, contour tillage (fig. 6), and permanent cover, is needed to control erosion. This soil is in capability unit 2 (IIe–1).

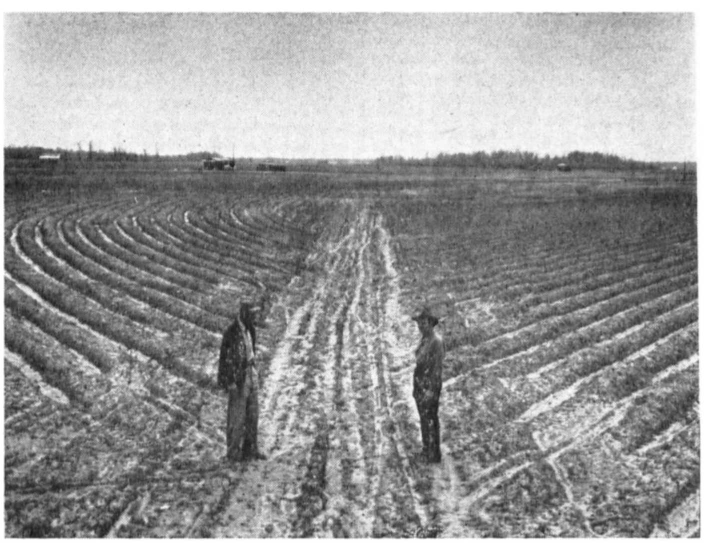


Figure 6.—On well-drained Dubbs very fine sandy loam, gently sloping phase, it is a good practice to plant crops in rows on the contour to control erosion and to conserve moisture and fertility.

Dubbs silt loam (½ to 2 percent slopes) (De).—This soil differs from Dubbs very fine sandy loam, nearly level phase, because other than the different surface layer—a silt loam instead of a very fine sandy loam—it normally has a slightly thicker subsoil that contains more silt and less sand. The higher content of silt in the surface layer causes this soil to crust more readily than the Dubbs very fine sandy loams. This soil is in capability unit 1 (I–1).

Dundee series

The Dundee series consists of productive, moderately slowly permeable, slightly to very strongly acid soils. The dark grayish-brown to light brownish-gray surface layers are underlain by brownish, moderately developed, mottled subsoils. These moderately fertile soils were formed from stratified alluvium of fine to medium texture that was washed in by the Mississippi River. They occur on old natural levees at elevations, and at distances from stream channels, intermediate between the associated Dubbs and Forestdale soils. The Dubbs soils are at the highest elevations and closest to stream channels, next are the Dundee soils, and finally the Forestdale, yet farther from the streams and at lower elevations.

The subsoil of the Dundee soils is more mottled and normally slightly finer textured than that of the Dubbs. The Dundee soils have a browner and less mottled subsoil than the Forestdale.

Dundee silt loam, nearly level phase (½ to 2 percent slopes) (Dn).—This somewhat poorly drained to moderately well drained, slightly acid to strongly acid soil occurs on old natural levees. It is of medium fertility and has moderately slow permeability and slow surface runoff. It has been slightly eroded.

Profile from a moist, cultivated field (NE¼NW¼ sec. 17, T. 16 N., R. 3 W.):

0 to 6 inches, light brownish-gray (10YR 6/2, dry) silt loam; friable; strongly acid; layer ranges from 5 to 7 inches in thickness.

6 to 22 inches, grayish-brown (10YR 5/2) silty clay that has common, medium, faint to distinct, yellowish-brown and brownish-yellow (10YR 5/6, 5/8, and 6/8) mottles; plastic, firm, very hard; strong medium subangular and angular blocky; very strongly acid; layer ranges from 12 to 20 inches in thickness, from silty clay to silty clay loam in texture, from grayish brown to yellowish brown in color, and from weak to strong subangular or angular blocky in structure.

22 to 36 inches, brown to yellowish-brown (10YR 5/3 to 5/4) silty clay loam that has many, medium, faint to distinct, dark-brown, yellowish-brown, and yellow (10YR 4/3, 5/8, and 7/8) mottles; plastic, friable to firm, hard; moderate to weak medium subangular blocky; medium acid; layer ranges from 6 to more than 20 inches in thickness, from silty clay loam to silt loam in texture, and from grayish brown to yellowish brown in color.

36 to 48 inches +, yellowish-brown (10YR 5/4) silty clay loam to silt loam that has many, medium, distinct, light yellowish-brown, yellowish-brown, and light-gray (10YR 6/4, 5/8, and 7/1) mottles; friable; medium acid to slightly acid; layer ranges from silty clay loam to very fine sandy loam in texture and from grayish brown to light brownish gray in color.

Areas of this soil include 139 acres of moderately shallow Dundee silt loam and loam, which occur mainly in the vicinity of Wolf Lake in the extreme southern part of the county. These included soils resemble the normal Dundee silt loams in the upper part of the profile, but the subsoils are a gray to dark-gray clay at depths of 18 to 30 inches. Thus, these moderately shallow soils have slightly poorer drainage and are more hazardous to manage.

Use suitability.—This soil is excellent for most of the common row crops but is planted mostly to cotton. Nitrogen fertilizer and organic matter are needed for best yields of cotton, corn, oats, and truck crops. Little, if any, drainage is needed. This soil can be worked most of the year (fig. 7). It is also desirable for homesites, gardens, and orchards. This soil is in capability unit I (I–1).

***Figure 7.*—Dundee silt loam, nearly level phase, is well suited to mechanized farming. This level, deep, and medium fertile soil retains moisture well and does not erode.**

Dundee silt loam, gently sloping phase (2 to 5 percent slopes) (Do).—This soil differs from the nearly level phase of Dundee silt loam in having slightly thinner layers and in occurring in narrow strips on stronger and more varied slopes. These slopes cause faster surface runoff. Consequently, the soil normally is slightly to moderately eroded. Areas of this soil include fairly large tracts that have a loam surface layer.

Use suitability.—Good management that includes the use of close-growing crops, contour tillage, and the use of permanent cover is needed to control erosion. This soil is in capability unit 2 (IIe–1).

Dundee silty clay loam, nearly level phase (½ to 2 percent slopes) (Dk).—This soil differs from Dundee silt loam, nearly level phase, in having a thinner surface layer, a thicker subsoil, and less sand throughout the profile. The thinner and finer surface layer is slightly less desirable to till than that of the Dundee silt loams, and it may crack much more during dry weather. This soil is in capability unit 6 (IIs–6).

Dundee silty clay loam, gently sloping phase (2 to 5 percent slopes) (Dm).—This gently sloping soil differs from the nearly level phase of Dundee silty clay loam in occurring in narrow bands on stronger and more varied slopes. These slopes cause faster surface runoff, and at times small areas are moderately eroded. Areas of this soil include about 60 acres of a moderately eroded, sloping Dundee silty clay loam.

Use suitability.—Good management that includes contour tillage and use of close-growing crops and permanent cover is needed to control erosion. This soil is in capability unit 3 (IIe–4).

Dundee very fine sandy loam (½ to 2 percent slopes) (Dp).—This soil differs from Dundee silt loam, nearly level phase, because it is slightly more sandy throughout the profile. The sandy surface layer is less likely to crust than that of Dundee silt loam, nearly level phase.

Profile from a cultivated field (NE¼NW¼ sec. 8, T. 15 N., R. 2 W.):

0 to 6 inches, light brownish-gray to pale-brown (10YR 6/2 to 6/3, dry) very fine sandy loam; soft; medium acid.
6 to 24 inches, dark-brown to brown (10YR 4/3 to 5/3, moist) silty clay to silty clay loam that has many, medium, faint to distinct, pale-brown, grayish-brown, and brownish-yellow (10YR 6/3, 5/2, and 6/8, moist) mottles; firm; strong medium subangular blocky; strongly acid.
24 to 38 inches, pale-brown (10YR 6/3, dry) silty clay loam to silt loam that has many, medium, faint to distinct, dark-brown, yellow, and yellowish-brown (10YR 4/3, 7/8, and 5/8, dry) mottles; slightly hard; moderate to weak medium subangular blocky; medium acid.
38 to 72 inches +, very pale brown (10YR 7/4, dry) silt loam to sandy loam that has many, medium, faint to distinct, light yellowish-brown, yellowish-brown, and light-gray (10YR 6/4, 5/8, and 7/1, dry) mottles; slightly hard; medium to slightly acid.

Areas of this soil include a fairly large acreage that has a loam surface soil, as the loam and the very fine sandy loam textures were not separated in mapping.

Use suitability.—This soil has been cleared and is used mainly for row crops, chiefly cotton. Nitrogen fertilizer and organic matter are needed for the best yields of cotton, corn, oats, and truck crops. Little, if any, drainage is needed. This soil can be worked during most of the year. It is desirable for homesites, gardens, and orchards. This soil is in capability unit 1 (I–1).

Dundee-Pearson silt loams (½ to 2 percent slopes) (Dr).—This mapping unit consists of two distinct soil types that are so intermingled that they cannot be mapped as separate units. They are somewhat poorly drained to moderately well drained and have moderately slow permeability. The friable silt loam surface layer is low in organic matter and often crusts after rains to such an extent that the stands of crops are poor.

These soils of somewhat low to medium fertility occur on the higher elevations of old natural levees in the vicinity of Silver Creek and Straight Bayou in the southwestern part of the county. They are closely associated with the soils of the poorly drained and somewhat poorly drained Forestdale-Brittain silt loam complex. Three kinds of profiles occur in this complex: Dundee silt loam, Pearson silt loam, and Pearson silt loam, moderately shallow.

Use suitability.—This complex is excellent for most locally grown row crops, but it is planted mostly to cotton. Nitrogen fertilizer and organic matter (fig. 8) will need to be added for best yields of cotton, corn, oats, and truck crops. These soils can be farmed during most of the year. This mapping unit is in capability unit 1 (I–1).

Profile of Dundee silt loam, nearly level phase, from a cultivated field (NW¼NE¼ sec. 13, T. 14 N., R. 4 W.):

0 to 7 inches, light-gray (10YR 7/2, dry) silt loam; friable; strongly acid.
7 to 13 inches, brown (10YR 5/3, dry) silty clay to silty clay loam that has a few, medium, faint, yellowish-brown (10YR 5/6, dry) mottles; plastic, very firm; very hard; strong medium subangular blocky; medium acid.

13 to 24 inches, grayish-brown (10YR 5/2, moist) silty clay to silty clay loam mottled with light gray and brownish yellow (10YR 7/2 and 6/8, moist); firm, moderate medium subangular blocky; strongly acid.
24 to 41 inches, pale-brown (10YR 6/3, moist) silty clay loam mottled with brownish yellow, light gray, and yellow (10YR 6/6, 7/2, and 7/8, moist); friable; weak medium subangular blocky to massive; strongly acid.
41 to 53 inches +, light brownish-gray (10YR 6/2, moist) silty clay to silty clay loam mottled with brownish yellow, yellowish brown, and reddish yellow (10YR 6/8, 5/8, and 7.5YR 6/8, moist); firm; massive; strongly acid.

***Figure 8.*—Cotton stalks on Dundee-Pearson silt loams. The stalks provide a protective cover during the winter and add organic matter that will improve the crop that follows.**

Soil that has this profile normally makes up 30 to 40 percent of an area of Dundee-Pearson silt loams.

Profile of Pearson silt loam, nearly level moderately shallow phase, from a cultivated field (NW¼NE¼ sec. 13, T. 14 N., R. 4 W.):

0 to 7 inches, very pale brown (10YR 7/3, dry) silt loam; very friable; strongly acid.
7 to 15 inches, brown (10YR 5/3, dry) silt loam with light-gray (10YR 7/2, dry) silt coatings; friable; moderate medium subangular blocky; very strongly acid.
15 to 25 inches, yellowish-brown (10YR 5/4, moist) silt loam to silty clay loam mottled with light gray, brownish yellow, dark yellowish brown, and dark brown (10YR 7/2, 6/6, 4/4, and 4/3, moist); friable; weak medium subangular blocky; very strongly acid.
25 to 35 inches, brown (10YR 5/3, moist) silty clay with light-gray (10YR 7/2, moist) silt coatings and mottled with brownish yellow and yellowish brown (10YR 6/8, 5/8, and 5/4, moist); very firm; weak medium subangular blocky to massive; very strongly acid.
35 to 47 inches, light brownish-gray (10YR 6/2, moist) silty clay loam mottled with yellowish brown, brownish yellow, strong brown and reddish yellow (10YR 5/8 to 6/8 and 7.5YR 5/8 to 6/6, moist); friable; massive; strongly acid.
47 to 60 inches +, pale-brown (10YR 6/3, moist) silt loam mottled with yellowish brown, brownish yellow, strong brown, and reddish yellow (10YR 5/8 to 6/8 and 7.5YR 5/8 to 6/6, moist); very friable; massive; strongly acid.

Field observations indicate that these moderately shallow phases of Pearson silt loam range from 14 to 30 inches in thickness and are underlain by buried profiles of Dundee soils. Soil that has this Pearson profile normally makes up 30 to 40 percent of an area of Dundee-Pearson silt loams.

Profile of Pearson silt loam, nearly level phase, from a cultivated field (NE¼NW¼ sec. 13, T. 14 N., R. 4 W.):

0 to 7 inches, light-gray (10YR 7/2, dry) silt loam; very friable; strongly acid.
7 to 16 inches, brown (10YR 5/3, dry) silt loam mottled with very pale brown and yellowish brown (10YR 7/3, 5/4, and 5/8, dry); friable; moderate medium subangular blocky; very strongly acid.
16 to 32 inches, yellowish-brown (10YR 5/4, dry) silt loam mottled with light gray and yellowish brown (10YR 7/1 and 5/8, dry); friable; weak medium subangular blocky; very strongly acid.
32 to 42 inches, brownish-yellow and very pale brown (10YR 6/6 and 7/3, dry) silt loam mottled with yellowish brown (10YR 5/4 and 5/6, dry); friable; massive; very strongly acid.
42 to 46 inches, light brownish-gray (10YR 6/2, moist) silty clay mottled with dark grayish brown and strong brown (10YR 4/2 and 7.5YR 5/8, moist); plastic, very firm, very hard; massive; very strongly acid; in some places layer occurs at a shallower depth or is lacking.
46 to 60 inches +, grayish-brown (10YR 5/2, moist) silty clay loam to silt loam mottled with dark yellowish brown and yellowish brown (10YR 4/4 and 5/8, moist); friable; massive; very strongly acid.

Soil that has this profile normally makes up 20 to 40 percent of an area of Dundee-Pearson silt loams.

Forestdale series

The Forestdale series consists of slowly permeable, poorly drained to somewhat poorly drained, very strongly acid to slightly acid soils. The light brownish-gray to grayish-brown surface layers are underlain by a mottled or highly mottled, grayish silty clay or silty clay loam. These soils are of medium to slightly low fertility and have formed from stratified alluvium of medium to fine texture that was washed in by the Mississippi River. They have some profile development. They occur on old natural levees and have poorer drainage than the Dubbs soils. The Forestdale soils also have poorer drainage than the Dundee soils, as is shown by their grayer and more mottled profiles. They occur at the lowest elevations on old natural levees and are slightly less productive than the Dundee soils.

Forestdale silt loam, nearly level phase (½ to 2 percent slopes) (Fm).—This poorly drained to somewhat poorly drained, slightly acid to very strongly acid soil is well distributed throughout the county on old natural levees. It has medium to slightly low fertility and a slow rate of surface runoff that can be improved by shallow ditching. In places it has been slightly eroded. The silt loam surface layer has a low content of organic matter, and it often crusts to such an extent after rains that stands of crops are poor. Small concretions of manganese and iron are common in the surface soil and upper subsurface layers.

Profile from a moist, cultivated field (NW¼SE¼ sec. 12, T. 16 N., R. 4 W.):

0 to 6 inches, light brownish-gray (10YR 6/2, dry) silt loam; very friable; medium acid; layer ranges from 4 to 7 inches in thickness and from grayish brown when moist to light gray when dry.
6 to 27 inches, gray (10YR 5/1) silty clay that has common, medium and coarse, distinct, dark yellowish-brown and yellowish-brown (10YR 4/4 and 5/8) mottles; plastic, very firm, very hard; moderate medium subangular blocky; very strongly acid; layer ranges from 14 to 22 inches in thickness, from silt loam to silty clay loam in texture, from gray to light brownish gray in color, and from weak to strong subangular blocky in structure.

27 to 54 inches, gray (10YR 6/1) silty clay loam that has common, medium, distinct, pale-brown (10YR 6/3) mottles; moderately plastic, firm, hard; weak subangular blocky to massive; very strongly acid; layer may range from gray to light brownish gray and may be stratified with sandier material.

54 to 66 inches +, light brownish-gray (10YR 6/2) silt loam with few, medium, faint, pale-brown (10YR 6/3) mottles; very friable; massive; medium acid to slightly acid.

Use suitability.—Most of this soil has been cleared and is now used for cotton, soybeans, oats, corn, or pasture. Drainage is needed. For best yields nitrogen fertilizer should be added, and also organic matter when feasible. Plant roots do not readily penetrate the fine-textured, moist subsurface layer. This soil is in capability unit 4 (IIs–3).

Forestdale silt loam, nearly level moderately shallow phase (½ to 2 percent slopes) (Fo).—The upper part of the profile of this soil is similar to Forestdale silt loam, nearly level phase, but the soil is underlain by clay at depths of 20 to 30 inches. This soil occurs mostly in the vicinity of Wolf Lake. A few areas that have a clay subsoil at a depth of only 16 inches were included.

Profile from a cultivated field (SE¼SE¼ sec. 21, T. 13 N., R. 3 W.):

0 to 5 inches, light-gray (10YR 7/2, dry) silt loam, friable; strongly acid.

5 to 24 inches, light brownish-gray (10YR 6/2, moist) silty clay loam that has many, medium, distinct to prominent, brownish-yellow and yellowish-brown (10YR 6/6 and 5/8) mottles; plastic, firm, hard; moderate medium subangular blocky; strongly acid.

24 to 37 inches, dark grayish-brown (10YR 4/2, moist) silty clay to clay that has common, medium, distinct, brown and yellowish-brown (10YR 5/3 and 5/8) mottles; plastic, very firm, very hard; weak subangular blocky to massive; medium acid; layer may be lacking in some places.

37 to 60 inches +, very dark gray (10YR 3/1, moist) clay that has a few, medium, faint, dark grayish-brown and dark yellowish-brown (10YR 4/2 and 4/4, moist) mottles; very plastic, very firm to extremely firm, extremely hard; massive; slightly acid to neutral.

The clay substratum affects the moisture of the whole profile; it is excessively wet in years of high rainfall and excessively dry in years of low rainfall.

Use suitability.—All of this soil has been cleared and is now used for common row crops, chiefly cotton. Some drainage in the form of W-type ditches is needed. Nitrogen fertilizer and organic matter are needed for the best yields of cotton, corn, oats, and truck crops. This soil is wetter during periods of heavy rainfall and dryer during periods when there is no rainfall than normal Forestdale silt loam, nearly level phase. This soil is in capability unit 4 (IIs–3).

Forestdale silt loam, gently sloping phase (2 to 5 percent slopes) (Fp).—This soil differs from Forestdale silt loam, nearly level phase, primarily by occurring in narrow strips on stronger and more varied slopes. The slopes increase surface runoff so that small areas have been moderately eroded. A few areas may be flooded occasionally.

Use suitability.—Good management that includes contour tillage and use of close-growing crops and permanent cover crops is needed to control erosion. This soil is in capability unit 4 (IIs–3).

Forestdale silt loam, moderately eroded sloping phase (5 to 8 percent slopes) (Fr).—The 5 to 8 percent slopes, much faster runoff, and thinner and more varied horizons throughout the profile distinguish this soil from Forestdale silt loam, nearly level phase. The plow layer is 2 to 5 inches thick, and in some small areas the silty clay subsoil is exposed. This soil is in narrow strips.

This soil is suited to small grains and winter legumes, but it is only fairly well suited to cotton, soybeans, and corn. A permanent cover of sod, however, is more desirable than row crops because growing clean-tilled crops for several years in succession may cause an erosion hazard. This soil is in capability unit 7 (IIIe–4).

Forestdale silt loam, nearly level overflow phase (½ to 2 percent slopes) (Fn).—This soil differs from Forestdale silt loam, nearly level phase, in that it is usually flooded by backwaters several weeks during the year, and it is normally more acid. Uncleared areas of this soil are covered by a 2- to 3-inch layer of matted, dark-brown, partly decomposed, deciduous forest litter. The soil occurs on low natural levees in the eastern half of Humphreys County.

Use suitability.—Often the water does not drain away in time to allow planting of cotton and similar crops. This soil is in capability unit 9 (IIIw–4).

Forestdale silty clay, nearly level phase (½ to 2 percent slopes) (Fa).—In profile and location this soil is similar to Forestdale silty clay loam, nearly level phase, but it differs in having a silty clay surface layer that cracks more readily during dry weather and in being more difficult to till. The small acreage of this soil is only fairly well distributed throughout the county. Included in the areas are small tracts that have a clay surface layer.

Profile from a moist, cultivated field (NE¼NW¼ sec. 13, T. 15 N., R. 5 W.):

0 to 4 inches, grayish-brown (10YR 5/2, dry) silty clay; firm; strongly acid.

4 to 26 inches, gray (10YR 5/1) silty clay to clay, highly mottled with yellowish brown and dark yellowish brown (10YR 5/8 and 4/4); very firm; moderate to strong medium subangular blocky; very strongly acid.

26 to 45 inches, gray (10YR 5/1) silty clay loam highly mottled with yellowish brown and dark yellowish brown (10YR 5/8 and 4/4); sticky, friable, hard; weak medium subangular blocky to massive; strongly acid.

45 to 72 inches +, light brownish-gray (10YR 6/2) silty clay loam to silt loam mottled with yellowish brown, brownish yellow, and yellowish red (10YR 5/4, 5/6, 6/8, and 5YR 4/8); friable; massive; slightly acid.

Use suitability.—All of the common crops are grown on this soil, but rice, pasture, hay, and soybeans are better suited than row crops. Surface drainage, in the form of W-type ditches, is needed for most areas. Nitrogen fertilizer and organic matter are needed for best yields of the nonlegume row crops, hay, and pasture. This soil is in capability unit 8 (IIIs–4).

Forestdale silty clay, gently sloping phase (2 to 5 percent slopes) (Fb).—This soil differs from Forestdale silty clay, nearly level phase, because it occurs in narrow strips on stronger and more varied slopes, and thus it has faster surface runoff that causes moderate erosion in spots.

Use suitability.—Good management that includes contour tillage and use of close-growing crops and permanent cover is needed to control erosion. This soil is in capability unit 8 (IIIs–4).

Forestdale silty clay loam, level phase (0 to ½ percent slopes) (Fc).—The small, scattered areas of this soil differ from Forestdale silty clay loam, nearly level phase, in staying wet for longer periods. The subsurface layer is slightly thicker and finer in many places and is more gleyed at shallower depths.

Use suitability.—Extensive surface drainage is needed to grow row crops (fig. 9). This soil is in capability unit 10 (IIIw–5).

***Figure 9.*—Drainage ditch under construction. Many of the soils in the county need surface drainage, which can be provided by drainage ditches.**

Forestdale silty clay loam, nearly level phase (½ to 2 percent slopes) (Fd).—This soil is intermediate between the typical slack-water soils, as Alligator clay, and typical soils of the old natural levees, as Dundee or Forestdale silt loams. It occurs at the highest elevations, as on the narrow old natural levees, in the predominantly slack-water areas. It is well distributed throughout the county.

This soil differs from Forestdale silt loam, nearly level phase, because it has a finer texture of silty clay loam and because it normally has a thinner surface layer and a slightly thicker subsoil that contains more clay and less sand. Also, the thinner, finer surface layer cracks more severely during dry weather and is not so easy to till. This soil has a silty clay subsurface layer that is, in many places, stratified with silty clay loam or sandy clay loam. In contrast, Alligator silty clay loam, nearly level phase, has a fine-textured subsurface layer, normally a clay. The Forestdale subsurface layer is less than 30 inches deep, in comparison to a depth of more than 30 inches for the subsurface layer of the Alligator silty clay loam. Also, the Forestdale subsurface layer has mottles of a more brownish color than the equivalent layer in the Alligator silty clay loam.

Profile from a moist, cultivated field (NW¼NW¼ sec. 2, T. 16 N., R. 5 W.):

0 to 4 inches, grayish-brown (10YR 5/2) silty clay loam; firm; strongly acid.

4 to 26 inches, gray to light brownish-gray (10YR 5/1 to 6/2) silty clay mottled with yellowish brown, brownish yellow, and brown (10YR 5/8, 6/8, and 7.5YR 5/4); very firm; moderate medium subangular blocky; very strongly acid.

26 to 53 inches, gray (10YR 5/1 to 6/1) silty clay loam mottled to highly mottled with brownish yellow and yellowish brown (10YR 6/6, 6/8, and 5/8); firm to friable; weak medium subangular blocky to massive; medium acid.

53 to 72 inches +, gray (10YR 5/1) silty clay loam to silt loam mottled with yellowish brown and brownish yellow (10YR 5/8 and 6/8); friable; massive; medium acid to slightly acid.

Use suitability.—Drainage is normally needed. The silty clay subsoil retains most of the irrigation water, so this soil can be used for growing rice. This soil is in capability unit 5 (IIs–4).

Forestdale silty clay loam, nearly level shallow phase (½ to 2 percent slopes) (Fg).—This soil is similar to Forestdale silty clay loam, nearly level phase, except that it has a clay substratum at depths of 16 to 22 inches. This clay layer makes the soil excessively wet in years of high rainfall and excessively dry in years of low rainfall. This soil is in capability unit 5 (IIs–4).

Forestdale silty clay loam, gently sloping phase (2 to 5 percent slopes) (Fh).—This soil differs from Forestdale silty clay loam, nearly level phase, primarily in having a thinner surface layer and more variable underlying layers, and secondarily, in occurring in narrow strips on stronger and more varied slopes. The stronger slopes increase surface runoff, so some spots are moderately eroded.

Use suitability.—Good management that includes contour tillage and use of close-growing crops and permanent cover is needed to control erosion. This soil is in capability unit 5 (IIs–4).

Forestdale silty clay loam, nearly level overflow phase (½ to 2 percent slopes) (Fe).—In contrast to Forestdale silty clay loam, nearly level phase, this soil is flooded for long periods, normally several weeks a year, and in many places it is more acid. Uncleared areas are covered by a 2- to 3-inch layer of matted, dark-brown, partly decomposed litter from deciduous trees. The soil occurs mostly in the eastern half of the county.

Use suitability.—Floodwaters seldom recede in time to plant cotton and similar crops. This soil is in capability unit 11 (IIIw–6).

Forestdale silty clay loam, gently sloping overflow phase (2 to 5 percent slopes) (Fk).—This soil differs from Forestdale silty clay loam, nearly level overflow phase, in having stronger and much more varied slopes and in being flooded for shorter periods. This soil is in capability unit 11 (IIIw–6).

Forestdale very fine sandy loam, nearly level phase (½ to 2 percent slopes) (Fs).—This soil differs from Forestdale silt loam, nearly level phase, in having slightly more sand throughout the profile and, in places, a slightly thinner subsurface layer. The surface layer does not crust so much as that of Forestdale silt loam, nearly level phase.

Profile from a moist, cultivated field (SW¼SW¼ sec. 34, T. 16 N., R. 3 W.):

0 to 7 inches, light brownish-gray (10YR 6/2, dry) very fine sandy loam; soft; strongly acid.

7 to 24 inches, gray (10YR 6/1) silty clay to silty clay loam mottled with yellowish brown and brownish yellow (10YR 5/6 and 6/8); firm; moderate medium subangular blocky; very strongly acid.

24 to 46 inches, gray (10YR 6/1) silty clay loam mottled with yellowish brown and light brownish gray (10YR 5/6, 5/8, and 6/2); firm to friable; weak medium subangular blocky to massive; very strongly acid.

46 to 60 inches +, light brownish-gray (10YR 6/2) silty clay loam to silt loam mottled with yellowish brown and dark brown (10YR 5/6, 5/8, and 4/3); friable; massive; strongly acid.

Soils that have loam surface layers were included in areas of this soil.

Use suitability.—Most of this soil has been cleared and is now used for the common row crops, chiefly cotton.

Some surface drainage in the form of W-type ditches normally is needed. Nitrogen fertilizer and organic matter are needed for best yields of cotton, corn, oats, and truck crops. This soil is in capability unit 4 (IIs–3). Higher cotton yields are produced on it than on any of the other soils in capability unit 4 (IIs–3).

Forestdale very fine sandy loam, gently sloping phase (2 to 5 percent slopes) (Ft).—The few areas of this soil differ from Forestdale very fine sandy loam, nearly level phase, in occurring as narrow strips on stronger and more varied slopes. These slopes cause faster surface runoff and generally cause the surface layer to be thinner and moderately eroded in spots.

Use suitability.—Good management that includes contour tillage and the use of close-growing crops and permanent cover is needed to control erosion. This soil is in capability unit 4 (IIs–3).

Forestdale-Brittain silt loams (½ to 2 percent slopes) (Fu).—This complex consists of two distinct soil types that are so closely associated they cannot be mapped separately. These soils are slowly permeable and are poorly drained to somewhat poorly drained. The friable silt loam surface layers have a low organic-matter content, and they often crust after rains so that the stands of crops are poor. In areas of this complex, the kind of soil, Forestdale or Brittain, can differ within a distance of a few feet.

These soils of somewhat low to medium fertility occur at lower elevations on the old natural levees in the vicinity of Silver Creek and Straight Bayou. They are closely associated with the soils of another complex—Dundee-Pearson silt loams. There are three distinct profiles in this complex—Forestdale silt loam, Brittain silt loam, and Brittain silt loam, moderately shallow phase.

Use suitability.—Most of this complex has been cleared and is used for cotton, soybeans, oats, corn, and pasture. It needs drainage and nitrogen fertilizer for good yields. This complex is in capability unit 4 (IIs–3).

Profile of Forestdale silt loam, nearly level phase, from a cultivated field (SW¼SW¼ sec. 23, T. 13 N., R. 4 W.):

0 to 7 inches, light-gray (10YR 7/2, dry) silt loam; very friable; strongly acid.
7 to 17 inches, light brownish-gray (10YR 6/2) silty clay that has many, medium, distinct, brownish-yellow and white (10YR 6/8 and 8/2) mottles; plastic, very firm, very hard; moderate medium subangular blocky; very strongly acid.
17 to 25 inches, gray (10YR 6/1) silty clay to silty clay loam mottled with brownish yellow (10YR 6/8); plastic, firm, very hard; moderate medium subangular blocky; very strongly acid.
25 to 42 inches, gray to light brownish-gray (10YR 6/1 to 6/2) silty clay loam highly mottled with brownish yellow and strong brown (10YR 6/8 and 7.5YR 5/8); friable; weak medium subangular blocky to massive; very strongly acid.
42 to 60 inches +, light brownish-gray (10YR 6/2) silt loam mottled with brownish yellow and reddish yellow (10YR 6/8 and 7.5YR 6/8); very friable; massive; very strongly acid.

Soil that has this profile normally makes up 30 to 50 percent of an area of the Forestdale-Brittain silt loams complex.

Profile of Brittain silt loam, nearly level phase, from a cultivated field (SW¼SW¼ sec. 23, T. 13 N., R. 4 W.):

0 to 7 inches, very pale brown (10YR 7/3, dry) silt loam; very friable; strongly acid.
7 to 16 inches, white (10YR 8/2, dry) silt loam mottled with yellowish brown and yellow (10YR 5/8 and 7/8, dry); very friable; weak medium subangular blocky; very strongly acid.
16 to 41 inches, light brownish-gray (10YR 6/2, moist) silt loam to silty clay loam mottled with brownish yellow and reddish yellow (10YR 6/8 and 7.5YR 6/8, moist); friable; weak medium subangular blocky to massive; strongly acid.
41 to 51 inches +, light brownish-gray to gray (10YR 6/2 to 6/1, moist) silty clay loam mottled with yellowish brown and strong brown (10YR 5/6 and 7.5YR 5/8, moist); firm to friable; massive; strongly acid.

Soil that has this profile normally makes up 20 to 40 percent of an area of the Forestdale-Brittain silt loams complex.

Profile of Brittain silt loam, nearly level moderately shallow phase, from a cultivated field (NE¼NW¼ sec. 26, T. 13 N., R. 4 W.):

0 to 7 inches, light-gray (10YR 7/2, dry) silt loam; very friable; medium acid.
7 to 16 inches, light-gray (10YR 7/1, dry) silt loam mottled with brownish yellow and strong brown (10YR 6/8 and 7.5YR 5/8, dry); very friable; weak medium subangular blocky; very strongly acid.
16 to 22 inches, gray to light-gray (10YR 6/1 to 7/1, dry) silty clay loam mottled with brownish yellow and strong brown (10YR 6/8 and 7.5YR 5/8, dry); firm to friable; moderate medium subangular blocky; very strongly acid.
22 to 36 inches, light brownish-gray (10YR 6/2, moist) silty clay mottled with brownish yellow and strong brown (10YR 6/8 and 7.5YR 5/8, moist); very firm; weak subangular blocky to massive; very strongly acid.
36 to 51 inches +, gray (10YR 6/1, moist) silty clay loam mottled with brown and brownish yellow (10YR 5/3 and 6/8, moist); firm to friable; massive; very strongly acid.

The profile shows that these moderately shallow phases of Brittain silt loam are underlain by buried profiles of Forestdale soils. The moderately shallow phases are 14 to 30 inches thick. Soil that has this profile normally makes up 30 to 40 percent of an area of the Forestdale-Brittain silt loams complex.

Iberia series

The Iberia series consists of poorly drained, slightly acid to alkaline, black to very dark gray, clayey soils. The soils were formed in old thickets under a predominantly cypress type of vegetation. The parent material was fine-textured dark alluvium washed in by the Mississippi River. These soils are associated with the Alligator soils, but they are slightly acid to alkaline, have black to very dark gray upper profiles, occur only in old natural brakes, contain more organic matter, and have developed under predominantly cypress rather than deciduous trees.

In Humphreys County this series is represented by only one soil, Iberia clay.

Iberia clay (0 to 1 percent slopes) (Ia).—This poorly drained, slack-water soil has very slow to slow surface runoff and very slow to slow internal drainage. It is slightly acid to alkaline. The soil occurs in only two places in the county—one about 2 miles north of Belzoni (sec. 22, T. 16 N., R. 3 W.), and the other in the northwestern corner (sec. 13, T. 16 N., R. 5 W.). A few spots that have a silty clay loam surface layer were included in areas of this soil. This soil has had little or no erosion.

Profile from a moist, cultivated field (SW¼NE¼ sec. 13, T. 16 N., R. 5 W.):

0 to 3 inches, very dark gray (10YR 3/1) clay; plastic and sticky when wet; strong medium granular structure; slightly acid; color ranges to black.

3 to 28 inches, very dark gray (10YR 3/1) clay that has a few medium, faint, black and dark reddish-brown (10YR 2/1 and 5YR 3/2) mottles; very plastic, very firm, very hard to extremely hard; massive when wet, weak and moderate, medium subangular blocky structure when dry; slightly acid; color ranges to black, and thickness from 7 to 27 inches.
28 to 36 inches, very dark gray (10YR 3/1) clay that has many, coarse, distinct, dark reddish-brown (5YR 3/4) mottles; very plastic, very firm, very hard to extremely hard; massive; neutral; this layer is absent in some places.
36 to 60 inches +, gray (10YR 5/1) clay that has many, coarse, prominent and distinct, yellowish-red, dark yellowish-brown, and dark-brown (5YR 4/6, 10YR 4/4, and 4/3) mottles; massive; neutral to slightly alkaline.

Decaying wood is scattered throughout the profile.

Use suitability.—The higher content of organic matter makes this soil easier to till and helps to produce higher yields than the associated Alligator clays. It needs extensive drainage, however. During most years this soil produces fair to good yields of cotton, corn, oats, and soybeans. Practically all of this soil is cultivated; it is in capability unit 8 (IIIs–4).

Swamp

Swamp is a miscellaneous land type that occurs on the beds of streams or lakes that no longer receive a regular flow of water. Normally, there are 18 inches to several feet of clayey sediments that were deposited from still waters, and under these, in places, there is sandy material that was dropped from fast-moving waters. The land is flooded most of the year and is covered with a thick growth of trees, bushes, and swamp vegetation. If the land is cleared and drained, it resembles the Dowling soils in unit 14 (IIIw–13).

This land is best used for timber and wildlife. Some of it occurs in each of the four soil association groups shown on the colored map at the back of the report. Swamp is indicated on the detailed soil map by swamp symbols.

Genesis, Morphology, and Classification of Soils[7]

Factors of Soil Formation

Soil is a function of climate, living organisms, parent materials, topography, and time. The nature of the soil at any point on the earth depends upon the combination of these five major factors at that point. All five factors come into play in the genesis of every soil. The importance of each differs from place to place; sometimes one is more important and sometimes another. In extreme cases one factor may dominate in the formation of the soil and fix most of its properties, as is common when the parent material consists of pure quartz sand. Little can happen to quartz sand, and the soils derived from it usually have faint horizons. Even in quartz sand, however, distinct profiles can be formed under certain types of vegetation where the topography is low and flat and a high water table is present. Thus, for every soil the past combination of the five major factors is of the first importance to its present character.

Climate

The climate of Humphreys County is of the humid, warm-temperate, continental type characteristic of the southeastern United States. The average temperature and the rainfall distribution by months are indicated in table 1. Over the county, climate has been a uniform factor in soil development but has made only a slight impression on the soils.

As a rule, regions with humid, warm-temperate climates have strongly weathered, leached, acid soils of low fertility. The flood plain of the Mississippi and Yazoo Rivers, however, is geologically young. Time has not yet permitted strong weathering of the sediments in place. The sediments themselves have come, in large part, from sections of the country where weathering is not intense. Thus, the kinds of soils normally associated with warm-temperate, humid climates do not occur in Humphreys County, though they are present within short distances to the east. The soils of this county resemble those commonly found in cooler and slightly drier climates.

Living organisms

Before the county was settled, the native vegetation was most important in the complex of living organisms that affect soil development. The activities of animals were seemingly of minor importance. The first settlers found a cover of dense forests broken by occasional canebrakes. Heavy stands of cypress filled the swampy areas, whereas hardwood stands occupied most of the better drained soils and many of the wet ones. The trees on the slight ridges were chiefly hickory, pecan, post oak, blackgum, and winged elm. In the swales and low places that were wet, but not swampy, the principal trees were tupelo-gum, sweetgum, soft elm, green ash, hackberry, cottonwood, overcup oak, and willow oak. Canebrakes covered many of the broader level areas between the swamps in the sloughs and bayous. These differences in native vegetation seem to have been associated mainly with variations in drainage. Only the major differences in the original vegetation are reflected to any extent in the soils, probably because of the general youth of the land surface.

With the development of agriculture in Humphreys County, man has become important to the future direction and rate of development of the soils. Clearing of the forests, cultivation of the soils, introduction of new species of plants, building of levees for flood protection, and artificial improvement of natural drainage will be reflected in the direction and rates of soil genesis in the future. Few results of these changes can as yet be seen. Some probably will not be evident for many centuries. The complex of living organisms affecting soil genesis in Humphreys County has been drastically changed, however, as a result of man's activity.

Parent materials

Alluvial sediments laid down by the Mississippi River and its tributaries are the chief parent materials of soils in the county. The total thickness of alluvium in Humphreys County ranges from many tens to several hundreds of feet.

The alluvium in Humphreys County is composed of particles of many different types of rock because it

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[7] Much of the material in this section was taken, with modification, from the Soil Survey of Tunica County, Mississippi (7).

originated in the wide reaches of the upper Mississippi River basin. Sedimentary rocks are most extensive in this upper basin, which extends from Montana to Pennsylvania, but other kinds of rock are also exposed and serve as sources of sediment in many places. Immense areas in the upper basin are mantled by recent glacial drift and loess. The alluvium along the lower stretches of the Mississippi, including Humphreys County, has come from the multitude of soils, rocks, and unconsolidated sediments of some 20 States. As a result, the alluvium consists of a mixture of minerals. Furthermore, many of the minerals are comparatively fresh and only slightly weathered.

Within Humphreys County, there are wide ranges in the texture of the alluvium because of differences in deposition. The alluvium was laid down by river water, either when quiet or in flood. As the river overflows its channel and the water spreads out over the flood plain, the coarser sediments are dropped first. Sands are commonly deposited in bands parallel to, and near, the channel. Low ridges thus formed are known as natural levees. As the floodwaters continue to spread, they move more slowly, and finer sediments, such as silts, are deposited next, usually in mixture with some sand and clay. When the flood has passed and water is left standing in the lowest parts of the flood plain, the finest sediments, or clays, may settle out. These so-called slack-water clays do not settle until the water becomes still.

The simple pattern of coarse sediments near the channel, fine sediments in slack-water areas some distance away, and medium-textured sediments between the two, is common along the numerous old stream channels scattered throughout the county. Over the centuries the river channel has migrated back and forth across much of the flood plain, sometimes cutting out natural levees laid down earlier, sometimes depositing sand on top of slack-water clays, or vice versa. The normal pattern of sediment distribution from a single channel has been partly or wholly truncated in many places, and beds of alluvium have been superimposed. All possible combinations of sediments resulting from the superimposition of the simple patterns, one upon another, now exist in the flood plain. Fragments of former channels with their adjacent sandy natural levees, the very gently sloping bodies of medium-textured sediments, and slack-water clays can be found in a number of places. On the whole the large areas of slack-water clays have been stable, partly because they lie farthest from the meander belt established by the river channel in the central part of the broad flood plain.

Textural differences in the alluvium are accompanied by some differences in chemical and mineralogical composition. Sandier sediments are usually higher in quartz than those of intermediate or fine textures. Conversely, they are lower in feldspars and ferromagnesian minerals. Sandier sediments characteristically have more silica and are lower in bases. They are also lower in carbonates, for the most part, but this is not always true.

Topography

Humphreys County is a small part of an immense flood plain that is nearly level. The topography ranges from the flat bodies of slack-water clays to the gently sloping succession of ridges and swales in areas that once bordered the river channel. Local differences in elevation are commonly measurable in feet. Seldom are there differences as great as 15 feet within 1 square mile. In some of the lowest and most nearly level parts of the flood plains, the maximum differences in elevation are less than 5 feet in as many square miles. Slopes are generally less than 2 percent in gradient. Greater slopes occur on a few streambanks. The total area of strong slopes in the county is negligible.

The flatness of the county contributes to the slow drainage of many of the soils. Water moves into the main channels with difficulty, especially from the areas of slack-water clays. Movement of water through such soils is also slow, which tends to accentuate drainage problems.

Time

Geologically, soils of the county are young. Even now some areas receive fresh sediments at frequent intervals. It seems probable that the sediments now forming the land surface in Humphreys County arrived during and after the advances of the Wisconsin glaciers, the latest of which was moving into the North Central States 11,000 years ago. The soils being formed on glacial drift of the Mankato stage (last of the Wisconsin glaciers) in those States show little horizonation other than the downward leaching of carbonates and the accumulation of organic matter in the surface layer. The present surface of the Mankato drift has probably been exposed for 8,000 years. Assuming that rates of horizon differentiation in the alluvium of Humphreys County would be as rapid as that in Mankato drift, the soils could be somewhat older than those of south-central Minnesota. Even so, the comparison indicates that the time span for the development of horizons in the soils of Humphreys County has been short.

Morphology and Composition of the Soils

Soil morphology in Humphreys County is expressed generally in faint horizons. Some of the soils do have one distinct, or prominent, horizon, but they are in the minority. None of the soils have prominent horizons within the solum. Generally speaking, horizon differentiation is in the early stages or has scarcely started, and the horizons themselves are indistinct.

The differentiation of horizons in soils of the county is the result of one or more of the following processes: (1) Accumulation of organic matter, (2) leaching of carbonates and salts more soluble than calcium carbonate, (3) translocation of silicate clay materials, and (4) reduction and transfer of iron. In most soil profiles in the county, two or more of these processes have operated in the development of horizons. For example, the first and last are the chief causes of the morphology of Iberia clay. All four processes have operated to some extent in the differentiation of horizons in Dundee soils.

Some organic matter has accumulated in the uppermost layer of all but a few soils in Humphreys County to form an A_1 horizon. Much of that organic matter is in the form of humus. The quantities are very small in some soils but fairly large in others. Soils that have faint and thin A_1 horizons are, at best, low in organic matter. Other soils, such as Iberia clay, have evident, fairly thick A_1 horizons fairly high in organic matter. Taking the soils of the county as a whole, the accumulation of organic matter has been most important among the processes of horizon differentiation.

Leaching of carbonates and salts has occurred in all soils of the county, although it has been of limited importance to horizon differentiation. The effects have been indirect, in that the leaching permitted the subsequent translocation of silicate clay minerals in some soils. Carbonates and salts have been carried completely out of the profiles of most of the well-drained soils. Even in the wettest soils, some leaching is indicated by the absence of carbonates and by the acid reactions. Leaching of the very wet soils is slow because water movement through the profile is itself slow.

Translocation of silicate clay minerals has contributed to the development of horizons in relatively few soils in the county, mainly in the Dubbs and Dundee. The darker coatings on ped faces and the clay films in former root channels in the B horizon of these soils indicate some downward movement of silicate clay minerals from the A horizons. The actual amount of clay movement has been small, but it has contributed to horizon differentiation. In the Dubbs and Dundee soils, translocation of clay has been about as important as the accumulation of organic matter in horizon differentiation. Leaching of carbonates and salts from the upper part of the profile seems to be a necessary prelude to the movement of silicate clays.

The reduction and transfer of iron, a process called gleying, has occurred in all of the very poorly drained, poorly drained, and somewhat poorly drained soils. It has also occurred to some extent in the deeper horizons of moderately well drained soils, such as Dundee very fine sandy loam. In the large areas of naturally wet soils in Humphreys County, the reduction and transfer of iron has been of importance in horizon differentiation.

The gray colors of the deeper horizons in the wet soils indicate the reduction of iron oxides. This reduction is commonly accompanied by some transfer of the iron, which may be local or general in character. After it has been reduced, iron may be removed completely from some horizons and may even go out of the soil profile. More commonly in Humphreys County, iron has moved a short distance and stopped either in the horizon of its origin or in a nearby horizon. Iron has been segregated within deeper horizons of many of the soils to form yellowish-red, strong-brown, or yellowish-brown mottles. Iron has also been segregated into concretions in deeper profiles of some soils.

The differentiation of the A_1 horizon from the deeper horizons in poorly drained soils of Humphreys County is caused in part by the reduction and transfer of iron. Horizon differences also result in part from a greater accumulation of organic matter in the surface layer. The effects of gleying—the reduction and transfer of iron—are evident but not prominent in the profiles of the soils in Humphreys County generally. This seems to reflect the youth of the land surface and of the soils. The time during which the sediments have been subject to horizon differentiation has not been long enough to permit the development of prominent horizons in the soil profiles.

Classification of Soils by Higher Categories

Soils are placed in narrow classes so that knowledge of their behavior within farms or counties can be organized and applied. They are placed in broad classes for study and comparison of large areas, such as continents. In the comprehensive system of soil classification followed in the United States (*8*), the soils are placed in six categories, one above the other. Beginning at the top, the six categories are the order, suborder, great soil group, family, series, and type. Table 8 shows the classification of the soil types of the county by orders, great soil groups, and series.

In the highest category the soils of the whole country are placed in three orders, whereas thousands of soil types are recognized in the lowest category. The suborder and family categories have never been fully developed and thus are seldom used. Attention has largely been given 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 orders. The nature of the soil series and soil type is discussed in another section, Soil Survey Methods and Definitions. Subdivision of soil types into phases, to provide finer distinctions significant to soil use and management, is also discussed in the same section.

TABLE 8.—*Soil types of Humphreys County classified by order, great soil group,*[1] *and series*

ZONAL SOILS

Great soil group	Series	Type
Gray-Brown Podzolic.	Dubbs	Dubbs silt loam.
		Dubbs very fine sandy loam.
	Dundee	Dundee silt loam.
		Dundee silty clay loam.
		Dundee very fine sandy loam.
	Pearson	Pearson silt loam.

INTRAZONAL SOILS

Great soil group	Series	Type
Humic Gley	Iberia	Iberia clay.
Low-Humic Gley	Forestdale	Forestdale silty clay.
		Forestdale silty clay loam.
		Forestdale silt loam.
		Forestdale very fine sandy loam.
	Alligator	Alligator clay.
		Alligator silty clay loam.
	Dowling	Dowling clay.
		Dowling soils.
	Brittain	Brittain silt loam.

[1] The azonal soils, the order normally listed below intrazonal, are not represented in this county.

The classes in the highest category of the classification scheme are the zonal, intrazonal, and azonal orders (*7*). The zonal order comprises soils with evident, genetically related horizons that reflect the predominant influence of climate and living organisms in their formation. The intrazonal order includes soils with evident, genetically related horizons that reflect the dominant influence of a local factor of topography, parent materials, or time over the effects of climate and living organisms. The azonal order includes soils that lack distinct, genetically related horizons, commonly because of youth, resistant parent material, or steep topography.

Zonal soils

Among the soils of Humphreys County, the soils of the Dubbs, Dundee, and Pearson series may be considered zonal. The horizons of these soils are evident but are normally faint rather than distinct. The horizons are genetically related and seem to reflect the influence of climate and living organisms, although the effect of time is also important. The three series are considered to fall barely within the zonal order and may be looked upon as intergrades to the azonal order.

The Dubbs, Dundee, and Pearson series are tentatively classified in the Gray-Brown Podzolic group. Gray-Brown Podzolic soils have a thin, dark A_1 horizon over a light brownish-gray and often platy A_2 horizon. The A_2 horizon is underlain by a brown to yellowish-brown, finer textured B horizon that grades to a lighter colored and usually coarser textured C horizon. This great soil group normally occurs in humid, cool-temperate climates under deciduous forests.

The Dubbs, Dundee, and Pearson soils lack a distinct A_2 horizon, but all areas of the soils have been disturbed through cultivation. Consequently, it seems highly probable that the plow layer now includes former thin A_1 and A_2 horizons. The soils clearly lack a thick, dark A_1 horizon and do not appear to have had one in the past. The present character of the B horizon, as shown by the Dubbs profile, the apparent absence of a thick A_1 horizon, and the probability that the A_1 and A_2 horizons have been mixed by plowing are the reasons for placing these three soil series in the Gray-Brown Podzolic group.

Intrazonal soils

Soils of the intrazonal order are by far the most extensive in Humphreys County. These include the Alligator, Brittain, Dowling, Iberia, and Forestdale series. All are very poorly drained, poorly drained, or somewhat poorly drained. None seem to have distinct horizons, although all show the effects of gleying and accumulation of organic matter in their morphology. These soils either are members of, or are closely related to, hydromorphic groups. The presence of a fairly thick A_1 horizon high in organic matter is used as a basis for placing the Iberia series in the Humic Gley group. By the same reasoning, the absence of a thick A_1 horizon high in organic matter is used as a basis for excluding the Alligator, Brittain, Dowling, and Forestdale series from the Humic Gley group. These four series seem more appropriately classified as Low-Humic Gley soils.

Recognition of the Low-Humic Gley group was proposed initially for somewhat poorly drained to poorly drained soils lacking prominent A_1 horizons but having strongly gleyed B and C horizons with little textural differentiation. The recognition of two great soil groups, Low-Humic Gley and Humic Gley (Wiesenboden) soils, was based on thickness of the A horizon and on its content of organic matter.

Humic Gley soils have a high content of organic matter, whereas Low-Humic Gley soils have moderate to low amounts. The Alligator, Brittain, Dowling, and Forestdale soils are not high in organic matter, and they do show effects of gleying in their morphology. On the basis of present knowledge, classification of the four series as Low-Humic Gley soils seems appropriate. However, the soils of the Brittain series intergrade to soils of the Gray-Brown Podzolic group, and the soils of the Alligator and Dowling series appear to be intergrades to Grumusols.

Recognition of Grumusols was proposed for a group of soils dominated by montmorillonitic clays. These soils are typically clay in texture, lack eluvial and illuvial horizons, have moderate to strong granular structure in the upper horizons, and have high coefficients of expansion and contraction upon wetting and drying. In the exchange complex of these soils, calcium and magnesium are dominant. With their high coefficients of expansion and contraction, the Grumusols shrink and swell markedly with changes in moisture content. In the process of shrinking and swelling, the soils crack and materials from upper horizons drop down into lower ones. Thus, the soils are being churned or mixed continually, a process that partially offsets horizon differentiation.

Grumusols may have prominent A_1 horizons, but they lack B horizons. They have dull colors of low chroma, as a rule, and are not well drained. Alligator clays and Dowling clays have many of the features common to Grumusols. The profiles have clay textures throughout, and the clay is dominantly montmorillonitic. They shrink and swell markedly with changes in moisture content.

Azonal soils

Azonal soils were not recognized in Humphreys County, despite the fact that the whole area consists of geologically recent alluvium. At the same time, all soils classified in the zonal and intrazonal orders are marginal to the azonal order because of their low degree of horizonation. Only the soils that lack genetically related horizons or that are in the initial stages of horizon differentiation are placed in the azonal order.

Additional Facts about Humphreys County

History and Development

The territory of Mississippi was organized into counties in 1838, the year the last Indian cession was divided by the legislature. Humphreys County, the most recently organized county in Mississippi, was consolidated on March 28, 1918. Land from five counties—Sunflower, Holmes, Sharkey, Washington, and Yazoo—formed the new county. The county was named in honor of Benjamin G. Humphreys, a general in the army of the Confederacy and the first governor of Mississippi to serve after the war between the States (*6*).

In 1825 Aluira Fisk, a wealthy New Orleans planter, built a boat landing on the Yazoo River at the present site of Belzoni, now the county seat. In 1828 he named it in honor of an old friend, Count Gioranni Batista Belzoni. In 1888 a fire destroyed Burtonia, a boat landing consisting of a store and several small buildings, on the north bank of the Yazoo River just south of Belzoni. The buildings were rebuilt at Belzoni landing. In 1895, a charter was obtained for the village of Belzoni. The population was 4,071, according to the United States Census of 1950.

When Humphreys County was first settled, there were no modern schools or improved roads, and much transportation was by boat on the Yazoo and Big Sunflower

Rivers. By 1922 the main highway, United States Highway 49W, had been built and paved with concrete. Today, State Highways 7, 12, 14, and 16 are lateral, mostly hard-surfaced roads that lead from Humphreys County to such towns as Itta Bena, Tchula, Anguilla, and Holly Bluff. Many side roads are graveled.

The Yazoo and Mississippi Railroad, a line of the Illinois Central, crosses the county in a general north to south direction parallel to United States Highway 49W. The railroad and highway routes connect Isola, Belzoni, Silver City, and Louise. The railroad through the State connects with Memphis, St. Louis, and Chicago markets to the north and with Vicksburg and New Orleans to the south. A branch line also runs generally southward from Silver City to Yazoo City, in Yazoo County.

Most of the elementary schools and all of the high schools are located in the larger communities, and buses furnish transportation.

Churches of various denominations are located throughout the county; the larger ones are in the towns.

Many communities have natural gas, and all have rural mail delivery, telephones, and electric power.

The county has one new hospital, and larger hospitals are in nearby Greenwood and Greenville just outside the county. Cases of malaria have been greatly reduced in recent years because of education, soil drainage, and insect-eradication campaigns.

The population of the county increased from 24,729 in 1930 to 26,257 in 1940. Then it decreased to 23,115 in 1950 because mechanized farm methods and diversified crops reduced the number of people needed for farm labor.

Industries

Humphreys County is basically agricultural and has few industries. At Belzoni, the county seat, 2 oilmills crush soybeans and cottonseed. A compress, a lumber company, an ice company, and 5 factories operate in the county. Several small sawmills and 17 cotton gins are scattered through the county. Commercial grain elevators are located in the towns of Isola, Belzoni, and Louise.

Agriculture

This section is provided mainly for readers not acquainted with the agriculture of Humphreys County. It tells about land use, principal crops, livestock, farm tenure, and farm equipment. The figures used are from the United States Census of Agriculture.

Land use

Humphreys County has a total area of about 262,400 acres. According to the census, 81.5 percent, or 213,844 acres, was in farms in 1954. In that year the land in farms was divided by use as follows:

	Acres
Cropland	145, 436
Harvested	125, 884
Not harvested or pastured	8, 145
Pastured	11, 407
Woodland	57, 116
Pastured	12, 043
Not pastured	45, 073
Pastured, other than woodland and cropland	4, 619
Other land	6, 673

Crops

The principal crops in Humphreys County are cotton, soybeans, oats, corn, rice, and hay (table 9). The acreage in cotton has fluctuated recently. In 1949, 87,838 acres of cotton was harvested, which was 74.5 percent of the total cropland harvested that year. In 1954, only 55,566 acres was harvested, and the acreage planted to cotton was further reduced in 1956. The Federal acreage allotments on cotton account for some of the shift in the pattern of cropping.

TABLE 9.—*Acreage of principal crops*

Crops	1929	1939	1949	1954
	Acres	*Acres*	*Acres*	*Acres*
Cotton harvested	92, 707	60, 792	87, 838	55, 566
Corn (harvested for grain)	12, 017	43, 077	13, 417	6, 767
Oats (combined or threshed)	24	3, 906	2, 028	13, 207
Soybeans (harvested for beans)	(1)	730	7, 973	35, 771
Rice (combined or threshed)	(1)	(1)	(1)	4, 491
Sweetpotatoes	120	307	[2] 60	[3] 30
Irish potatoes	22	132	[2] 17	[3] 9
Hay:				
Alfalfa	122	1, 440	198	55
Lespedeza	(1)	495	1, 877	944
Soybeans and cowpeas	220	13, 490	2, 336	3, 871
Other hay (excluding sorghum)	41	173	787	1, 032

[1] Data not available.
[2] Farms harvesting more than 15 bushels.
[3] Farms harvesting more than 20 bushels.

Yields of cotton, once steadily decreasing, have recently been improved by use of new varieties, new insecticides, improved machinery, and better management. In 1955 an average of 600 pounds of lint cotton per acre was grown, the highest yield recorded in the county.

Corn yields are variable and are generally low. In the future the yields could be greatly increased by selecting suitable soil, adding nitrogen, and irrigating.

Soybeans are grown extensively, but average yields are low. During wet growing seasons the yields are usually high, but during dry growing seasons yields are often very low. Soybeans are ordinarily planted for the production of oil, but in a dry season a fairly large percentage of the crop is cut for hay. In 1954, 9 percent of the soybean acreage was cut for hay.

Oat acreages have increased because of the restrictions on cotton, and yields of as much as 90 bushels an acre have been reported. The average yield for 1954, however, was about 43 bushels an acre. Less labor is needed for oats than for cotton or corn, and oats grow well on more kinds of soils. Winter wheat and barley produce good yields but are not grown extensively.

Rice, a fairly new crop in the county, is well suited to some of the poorly drained, clayey soils. The acreage in rice has increased rapidly. In 1954, 4,491 acres of rice was grown, and yields that year averaged 40 bushels an acre. After planting rice for 2 successive years, however, yields decline sharply.

Lespedeza is one of the most extensive hay crops planted in the county. Small grains mixed with vetch and winter peas are also fairly extensive. In 1954, these hay crops averaged almost 1 ton of hay per acre. Yields are higher in wet growing seasons than in dry seasons.

The acreage planted to alfalfa for hay has decreased from 1,440 acres in 1939 to 55 acres in 1954, but alfalfa gives good yields if it is managed properly. The normal acidity of most soils of the county must be neutralized with lime to get highest yields of alfalfa, sweet clover, or red clover. These crops, however, are seldom planted.

Vetch and winter peas are the principal winter cover crops. They are turned under early in spring. To some extent, vetch and winter peas are planted to supplement winter grazing, and they are sometimes harvested for seed.

Livestock

The number of work horses or mules in the county has dropped steadily. In 1950 there were 3,213 on 1,122 farms, but only 1,483 on 601 farms in 1954. This reflects the use of power machinery. In 1954 only 23 percent of the farms had a horse or mule.

The number of cattle increased from 4,607 in 1950 to 11,444 in 1954. The increase is mostly in beef cattle because, before 1945, most of the cattle on farms were kept by tenants to provide milk for household use. Many of the beef herds now are good grades of Angus, Hereford, and Shorthorn. Raising beef cattle should be profitable on many farms because the cattle can be pastured most of the year.

The number of hogs has decreased. A total of 8,615 was reported in 1950, as compared to 6,567 in 1954. Many of the hogs are raised by tenants for home use.

Before 1945 there were few sheep in the county. In 1954 there were 541, and 2,284 pounds of wool were shorn from 414 sheep.

Pasture

Before 1950, pastures were located for the convenience of the farm operator. The suitability of the soils for pasture was seldom considered. Favorable prices for livestock, acreage controls on cotton, and improved pasture management brought a sharp increase in pasture acreage between 1945 and 1951. Soils that were poorly suited to cotton but well suited to grass were planted to permanent pasture and were used to graze many small beef herds and several sheep herds.

Livestock prices have fluctuated sharply since 1952. However, pastures for the production of beef, pork, mutton, and some milk will continue to be important in Humphreys County. The pastures are valuable because cotton acreage is limited, because livestock can graze most of the year, and because most soils produce higher yields of row crops if pasture is grown in rotation with the row crops.

Size and tenure of farms

From 1950 to 1954 the number of farms in the county decreased by almost 20 percent. But in 1954 the 2,614 farms averaged 81.8 acres, an increase of 25 percent in size since 1950.

The following figures from the 1954 census show the percentage of the total number of farms of various sizes.

Size in acres:	*Percentage of total farms in county*
Less than 10	17. 8
10 to 29	46. 9
30 to 49	10. 9
50 to 99	12. 7
100 or more	11. 7

In 1954, 21.6 percent of the farm operators owned their land, 7 percent were part owners, 0.4 percent were managers, and 71 percent were tenants. Sharecroppers, supervised by managers, operate most of the large farms. In this system the farm owner, or operator, furnishes all equipment and work animals and he advances credit for food and personal expenses. In return, the owner receives from the sharecropper 50 percent of the cotton grown and interest on the money loaned.

Many tenants now rent land and furnish their own equipment and animals. Some tenants pay cash for rent. Others pay the fee for rent in crops, usually a third of the cotton crop and a fourth of the corn crop.

Farm equipment

In 1954 there were 1,310 automobiles on 959 farms, 1,051 motortrucks on 822 farms, 2,317 tractors on 837 farms, 345 grain combines on 271 farms, and 88 pick-up hay balers on 80 farms. This means that about 37 percent of the farms had automobiles, 31 percent had motortrucks, 32 percent had tractors, 10 percent had grain combines, and 3 percent of the farms had pick-up hay balers. This was an increase of 122 percent in automobiles, 127 percent in motortrucks, and 237 percent in tractors on the farms since 1945. The land is suited to tractor farming, and most of the large farms use tractors exclusively.

In 1954, 90 percent of the farms had electricity, 9 percent had telephones, 19 percent had water piped to the farm, 15 percent had home freezers, and 9 percent had television sets.

Soil Survey Methods and Definitions

The scientist who makes a soil survey examines the soils in the field, classifies them according to the facts that he observes, and draws their boundaries on an aerial photograph or other map.

Field study.—The soil surveyor bores or digs many holes, about 40 inches deep, to see what the soils are like. The holes are not spaced in a regular pattern; they are located according to the lay of the land. Normally, the borings are not more than a quarter of a mile apart, but in some areas they are much closer. In most soils there are several distinct layers, called horizons, which collectively are known as the soil profile. Each layer is studied to see how it differs from others in the profile and to learn the things about the soil that influence its ability to support plant growth.

Color is normally related to the amount of organic matter. The darker the surface soil, as a rule, the more organic matter it contains. Streaks and spots of gray, yellow, and brown in the lower layers generally indicate poor drainage and poor aeration. Colors are given in descriptive terms, such as "dark grayish brown." Following the word description is a Munsell color symbol, as 10YR 4/2, which corresponds to the term "dark grayish brown." Munsell notations are a means of recording color more accurately than can be done in words. These notations are useful to those who must make fine comparisons of soils. Mottling is indicated by descriptive words in a definite sequence; for example, "common, fine, distinct, yellowish-brown mottles." The word "common" indicates number of mottles; the word "fine," the size of the mottles; and the word "distinct," the degree to which the mottles contrast with the base color of the soil.

Texture, or the content of sand, silt, and clay, is determined by the way the soil feels when rubbed between the fingers, and it is later checked by laboratory analysis. Texture determines how well a soil retains moisture, plant nutrients, and fertilizer; it also determines to what degree it may crack during dry weather, and whether it is easy or difficult to cultivate.

Structure, which is the way the individual soil particles are arranged in larger aggregates and the amount of pore space between grains, gives clues to the ease or difficulty with which the soil is penetrated by plants and by moisture.

Consistence, or the tendency of the soil to crumble or to stick together, indicates whether it is easy or difficult to keep the soil open and porous under cultivation. Some terms commonly used for consistence are *friable, plastic, sticky, hard, compact, tough,* and *cemented*. Several terms may be used to describe the consistence of a soil at different degrees of moisture content. For example, "very plastic, very firm, very hard" means very plastic when wet, very firm when moist, and very hard when dry.

Other characteristics observed in the course of the field study and considered in classifying the soils include the following: The depth of the soil over compact layers; the content of organic matter; the depth of root penetration; the steepness and pattern of slopes; the degree of erosion; the nature of the underlying rocks or other material from which the soil has developed; and the acidity or alkalinity of the soil as measured by chemical tests.

Simple chemical tests show how acid the soil may be. The reaction of a soil is its degree of acidity or alkalinity expressed mathematically as a pH value. A pH value of 7 indicates precise neutrality; higher values, alkalinity; and lower values, acidity.

CLASSIFICATION.—On the basis of characteristics observed by the field survey team or determined by laboratory tests, soils are classified into types, phases, and series. The soil type is the basic classification unit. A soil type may consist of several phases. Soil types that resemble each other in most of their characteristics are grouped into a soil series.

Soil type.—Soils similar in kind, thickness, and arrangement of soil layers and that have the same texture in the surface layer are classified as one soil type.

Soil series.—Two or more soil types that differ in texture of the surface layer but are otherwise similar in kind, thickness, and arrangement of layers, are normally designated as a soil series. In a given area, however, a soil series may be represented by only one soil type. Each soil series is named for the place near which it was first mapped.

Soil phase.—Because of differences other than kind, thickness, and arrangement of layers, and in texture of the surface layer, some soil types are divided into two or more phases. Differences in slope, degree of erosion, depth of the soil over the substratum, or type of drainage (natural or artificial) are examples of characteristics that suggest dividing a soil type into phases.

The soil phase (or the soil type if it has not been subdivided) is the mapping unit, or soil, shown on the soil map. It is the unit that has the narrowest range of characteristics. Use and management practices therefore can be specified for the soil phase more easily than for the soil type, the soil series, or yet broader groups that contain more variation.

As an example of soil classification, consider the Alligator series. This series is made up of 2 soil types, which are subdivided into 8 phases:

Series	*Type*	*Phase*
Alligator	Clay	Level.
		Level overflow.
		Nearly level.
		Nearly level overflow.
		Gently sloping.
	Silty clay loam	Nearly level.
		Nearly level overflow.
		Gently sloping.

Soil complex.—If two or more different kinds of soils are so intricately associated in small areas that it is not practical to show them separately on the soil map, they are mapped together as a soil complex. Dundee-Pearson silt loams is 1 of 3 soil complexes mapped in Humphreys County.

Undifferentiated soils.—Two or more soils that are not regularly associated geographically may be mapped as an undifferentiated group—a single unit—if the differences between them are too slight to justify a separation. An example is Alligator, Dowling, and Forestdale soils, overflow phases.

Miscellaneous land types.—Areas that have little true soil, as fresh stream deposits, stony areas, and severely gullied areas, are not classified into types and series but are identified by descriptive names. Swamp is a miscellaneous land type in Humphreys County.

Glossary

Aggregate. A cluster of primary soil particles held together by internal forces to form a clod or fragment.

Alluvial soils. An azonal group of soils developed from transported and relatively recently deposited material (alluvium). The soils are characterized by a weak modification, or none, of the original material by soil-forming processes.

Alluvium. Fine material, as sand, silt, or clay, deposited on land by streams.

Bedrock. Solid rock that underlies soils.

Colluvium. Deposits of rock fragments and soil materials that have accumulated at the bases of slopes through the influence of gravity; it includes creep and local wash, and the materials are mixed.

Consistence, soil. The attributes of soil material that are expressed by the degree and kind of cohesion and adhesion or by the resistance to separation. Terms commonly used to describe consistence are *brittle, compact, firm, friable, plastic, sticky,* and *stiff*.

Brittle. The term used to describe a soil that, when dry, breaks with a sharp, clean fracture; if struck a sharp blow, it shatters into cleanly broken hard fragments.

Compact. Dense and firm but without cementation.

Firm. Resistant to forces tending to produce rupture or deformation.

Friable. Readily ruptured and crushed when moderate force is applied.

Plastic. Readily deformed without rupture; pliable but cohesive; readily molded; puttylike.

Sticky. Adhesive rather than cohesive when wet but normally very cohesive when dry. Soil shows a decided tendency to adhere to other materials and objects when wet.

Stiff. Resistant to deformation or rupture; firm and tenacious and tending toward imperviousness. The term is usually applied to condition of the soil in place and moderately wet.

Drainage ditches. *See* V-Ditches; W-Ditches.

Erosion, soil. The wearing away or removal of soil material by water or wind.

Fertility, soil. The quality that enables a soil to provide the proper compounds, in the proper amounts and in the proper balance, for the growth of specified plants when other factors, as light, temperature, and the physical condition of the soil are favorable.

First bottom. The normal flood plain of a stream, part of which may be flooded only at infrequent intervals; land along a stream that is subject to overflow.

Gleyed soil. Soil that has been saturated with water for long periods with organic matter present. It is intensely reduced chemically. The soil contains ferrous iron and neutral brown colors that turn browner when exposed to air.

Horizon, soil. A layer of soil, approximately parallel to the soil surface, that has well-defined characteristics.

Horizon A. The upper horizon of the soil mass from which material has been removed by percolating waters; the eluviated part of the solum; the surface soil. This horizon is generally divided into two or more subhorizons, of which the A_0 is not a part of the mineral soil but the accumulation of organic debris on the surface. Other subhorizons are given designations, as A_1 or A_2.

Horizon B. The horizon to which materials have been added by percolating water; the illuviated part of the solum; the subsoil. This horizon may be divided into several subhorizons, depending on the color, structure, consistence, and character of the material deposited. These subhorizons are given designations, as B_1 or B_2.

Horizon C. A layer of unconsolidated material, little affected by the influence of organisms and presumed to be similar in chemical, physical, and mineralogical composition to the material from which at least a part of the overlying solum has developed.

Mottling, soil. Contrasting color patches that vary in number and size.

Normal soil. A soil that has a profile in equilibrium or nearly in equilibrium with its environment (native vegetation and climate), developed under good, but not excessive, drainage from parent material of mixed mineralogical, physical, and chemical composition, and expressing the full effects of the forces of climate and living matter.

Permeability, soil. That quality of the soil that enables it to transmit water and air.

Phase, soil. A subdivision of the soil type covering variations that are chiefly in such external characteristics as relief, stoniness, or accelerated erosion.

Productivity, soil. The capability of a soil to produce a specified plant or sequence of plants under a given system of management.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material. (*See also* Horizon, soil.)

Reaction. The acidity or alkalinity of the soil.

Series, soil. A group of soils that have the same profile characteristics and the same general range in color, structure, consistence, and sequence of horizons; the same general conditions of relief and drainage; and generally a common or similar origin and mode of formation. A group of soil types similar in all respects except for the texture of the surface soil.

Soil. The natural medium for the growth of land plants on the surface of the earth. Soil is composed of organic and mineral materials. Its properties result from the modification of the parent material by physical, chemical, and biological forces that have acted over a period of time.

Structure, soil. The arrangement of the individual grains and aggregates that make up the soil mass; may refer to the natural arrangement of the soil when in place and undisturbed, or to the soil at any degree of disturbance. Such terms as *prismatic, columnar, blocky, subangular blocky, platy, crumb,* and *granular* are used to describe soil structure.

Subsoil. Technically, the B horizon; roughly, that part of the profile below plow depth.

Substratum. The material underlying the subsoil.

Surface soil. Technically, the A horizon; commonly, that part of the upper profile usually stirred by plowing.

Terrace (geologic). An old alluvial plain, generally level or smooth, bordering a stream; seldom subject to overflow; frequently a terrace is called a second bottom in contrast to a flood plain.

Texture, soil. The size of individual particles that make up the soil mass. The various soil separates are classified by size groups, as sand, silt, and clay. A coarse-textured soil is one high in content of sand; a fine-textured soil has a large proportion of clay.

Clay. A soil separate or size group of mineral particles less than 0.002 mm. in diameter. Clay as a textural class includes soil material that contains 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Silt. A soil separate having diameters ranging from 0.05 mm. to 0.002 mm. As a textural class silt includes soil material that contains 80 percent or more silt and less than 12 percent clay.

Sand. A soil separate that ranges in diameter from 2.0 mm. to 0.05 mm. As a textural class it includes soil material that contains 85 percent or more sand and not more than 10 percent clay.

Topsoil. Presumably fertile soil material used to topdress roadbanks, gardens, and lawns.

Type, soil. A subdivision of the soil series based on the texture of the surface soil.

Upland (geologic). Land that consists of materials unworked by water in recent geologic time and ordinarily lying at higher elevations than the alluvial plains.

V-Ditches. Narrow ditches that are V-shaped or that have vertical sides. These should be at least 1 foot deep and 1 foot wide and should have no more than 1 foot rise in 4 feet of slope.

W-Ditches. Two parallel drainage ditches placed on opposite sides of the spoilbank. The channels are about 30 feet apart, and the excavated soil is placed between them. In cross sections these ditches resemble the letter W.

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SUPPLEMENT TO THE SOIL MAP: IMPORTANT

SOILS OF

Series	Relief	Surface runoff	Degree of erosion	Permeability of soil
Formed mostly from alluvium of fine and medium texture:				
Dowling	Level or nearly level	Very slow or ponded	None, soil accumulates.	Very slow
SOILS OF THE SLACK-				
Formed mostly from clayey alluvium:				
Alligator	Level to gently sloping	Very slow to medium	None to moderate	Very slow and slow
Iberia	Nearly level or level	Slow to very slow	None and slight	Very slow and slow
SOILS OF THE OLD				
Formed from stratified alluvium of fine, medium, and coarse texture:				
Dubbs	Nearly level and gently sloping.	Slow and medium	None to moderate	Moderate
Dundee	Nearly level and gently sloping.	Slow and medium	None to moderate	Moderately slow
Forestdale	Level to sloping	Very slow to medium	None to moderate	Slow
Formed mostly from silty alluvium:				
Pearson	Nearly level	Slow	None or slight	Moderately slow
Brittain	Nearly level	Slow	None or slight	Slow

[1] Applies particularly to the subsurface layer, which normally has a slightly finer texture than the surface layer.

CHARACTERISTICS OF SOIL SERIES

THE DEPRESSIONS

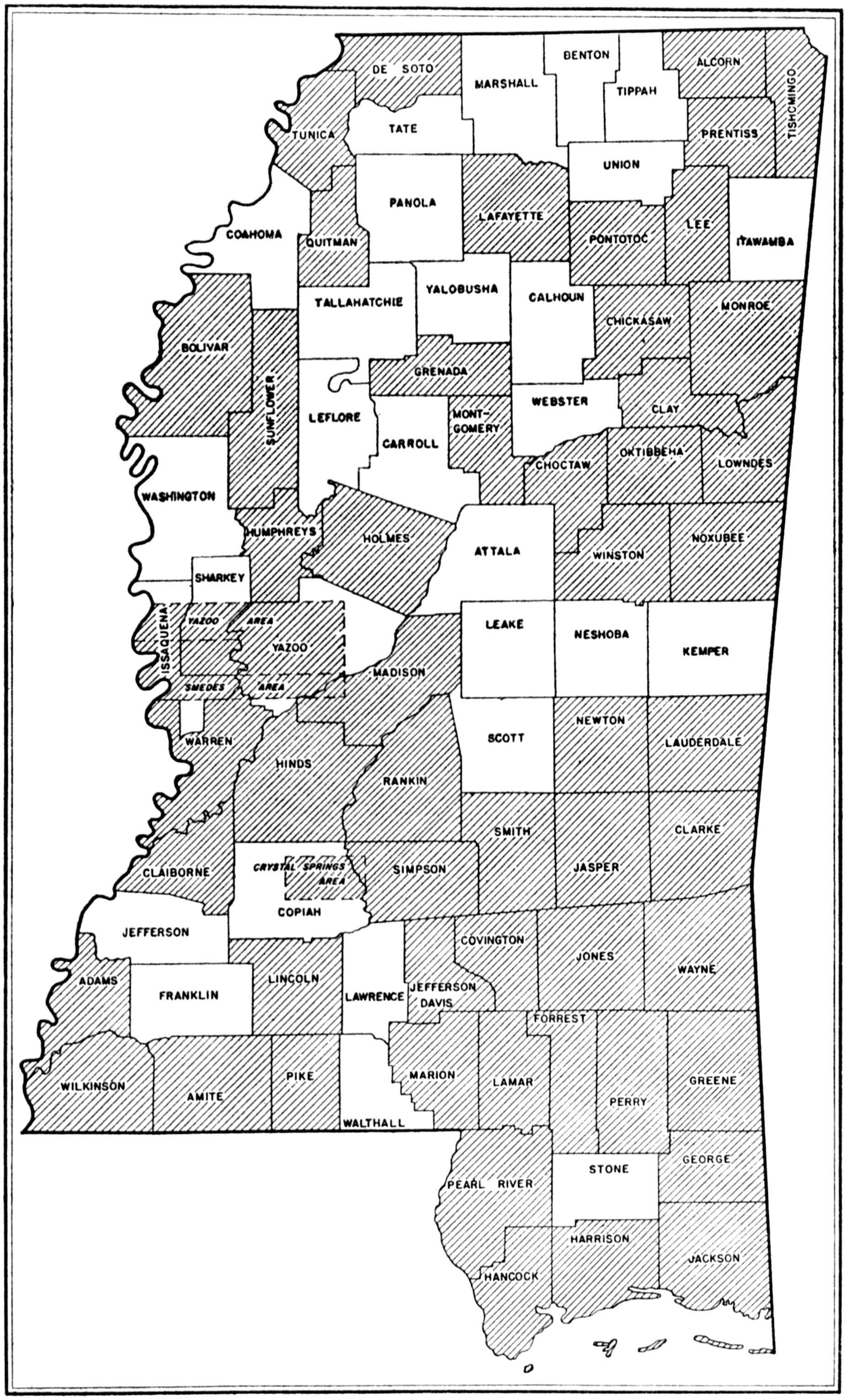
Drainage	Surface soil	Subsoil [1]
Poorly drained and very poorly drained.	Very dark gray to gray clay to silt loam, 3 or more inches thick.	Mottled dark-gray to gray clay or silty clay, underlain by mottled gray clay.

WATER AREAS

Drainage	Surface soil	Subsoil [1]
Poorly drained	Grayish-brown to dark-gray clay and silty clay loam, 2 to 4 inches thick.	Highly mottled gray clay, underlain by mottled gray clay.
Poorly drained	Black or very dark gray clay, 2 to 4 inches thick.	Mottled black or very dark gray clay, underlain by highly mottled gray or dark-gray clay.

NATURAL LEVEES

Drainage	Surface soil	Subsoil [1]
Moderately well drained and well drained.	Grayish-brown to pale-brown very fine sandy loam and silt loam, 5 to 8 inches thick.	Mottle-free or faintly mottled dark-brown to yellowish-brown silty clay to clay loam, underlain by slightly mottled brownish silty clay loam to sandy loam.
Somewhat poorly drained and moderately well drained.	Dark grayish-brown to light brownish-gray silty clay loam to very fine sandy loam, 4 to 7 inches thick.	Mottled grayish-brown, brown, yellowish-brown, or pale-brown silty clay to silty clay loam, underlain by mottled brownish silty clay loam to sandy loam.
Poorly drained and somewhat poorly drained.	Light brownish-gray to grayish-brown silty clay to very fine sandy loam, 3 to 7 inches thick.	Highly mottled gray to light brownish-gray silty clay or silty clay loam, underlain by mottled grayish silty clay loam stratified with sandier soil.
Somewhat poorly drained and moderately well drained.	Pale-brown silt loam, 5 to 8 inches thick	Mottled brown and yellowish-brown silt loam, underlain by mottled brownish silt loam or silty clay loam.
Poorly drained and somewhat poorly drained.	Light-gray to pale-brown silt loam, 5 to 8 inches thick.	Highly mottled light-gray to light brownish-gray silt loam, underlain by mottled grayish silt loam or silty clay loam.



Areas surveyed in Mississippi shown by shading.

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