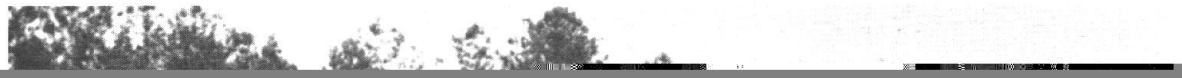
SOIL SURVEY OF

Oktibbeha County, Mississippi



Major fieldwork for this soil survey was done in the period 1959–67. Soil names and descriptions were approved in 1968. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1967. This survey was made cooperatively by the Department of Agriculture, Soil Conservation Service and Forest Service, and the Mississippi Agricultural Experiment Station. It is part of the technical assistance furnished to the Oktibbeha County Soil Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Carto-

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SOIL SURVEY OF OKTIBBEHA COUNTY, MISSISSIPPI

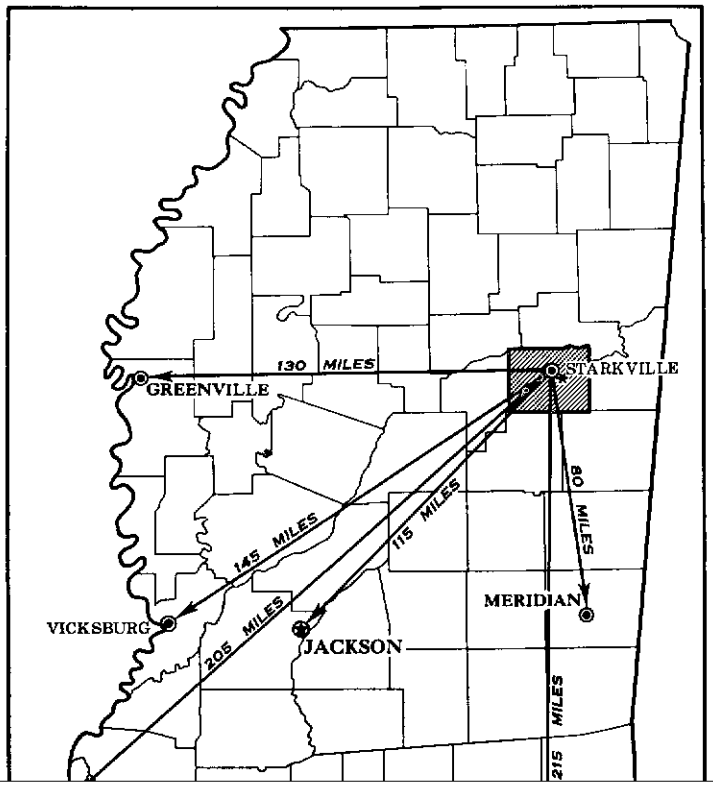
BY FLOYD V. BRENT, JR.

FIELDWORK BY FLOYD V. BRENT, JR. AND LELAND C. MURPHREE, SOIL CONSERVATION SERVICE

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

OKTIBBEHA COUNTY is located in the east-central part of Mississippi (fig. 1) and has a land area of 290,560 acres, or 454 square miles. Starkville, the county seat, is the largest town in the county. Mississippi State University and the Mississippi Agricultural Experiment Station are located 1½ miles east of Starkville. Enrollment at the university in 1968 was 8,498.

Dairying, raising of beef cattle, and tree farming are the main enterprises. Cotton, once the leading crop, was planted on less than 2,000 acres in 1967.



How This Survey Was Made

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

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with

series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

kinds of soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map.

recent alluvium derived from the prairie and coastal plain uplands.

This association occupies about 8 percent of the county.

grayish brown in the upper part and light brownish gray in the lower part.

The minor soils of this association are the somewhat

ture, and hay are grown on this association. Most farms have a vegetable garden for home use.

The soils of this association have some limitations caused by flooding. If protected and adequately drained, they are well suited to most of the commonly grown

of about 16 inches, and mottled clay and chalk at a depth of about 45 inches.

Most of the less sloping areas in this association have been cultivated in the past but are now in pasture, hay, or silage. Most of the steeper slopes have remained as

and are separated by fingerlike extensions of the original soil material. Some areas up to 2 acres in size have lost all soil material and consist only of firm chalk.

Many of the sloping, strongly sloping, and steep areas in this association have never been cleared. The areas of steep soil that have been cleared and row cropped have been damaged by severe sheet and gully erosion. Most of these severely eroded areas are reverting to cedar and bois d'arc trees or are in pasture. The areas of chalk outcrop are idle or support scattered patches of sweetclover or cedar trees. Some of the acid areas on the steep slopes have mixed stands of hardwood and pine timber.

The farms in this association are a little larger than average for the county. They range from 100 to 250 acres in size, and some extend onto the adjoining more productive flood plains. Most of the farms on this association are dairy or beef farms or tree farms. The sloping to strongly sloping soils are mostly in pasture or hay, and the soils on flood plains are in silage crops, hay, or pasture.

The ridgetops and flood plains are suited to cultivation, but erosion is a hazard on the ridges, and the bottoms are subject to flooding. Some parts of this association are suited to pine trees and adapted hardwoods.

6. *Kipling-Brooksville-Sumter association*

Somewhat poorly drained to well-drained, acid and alka-

Some of the largest farms in the county are in this association. The farms range from about 100 acres to 500 acres in size. They are mainly dairy and beef farms. Most of this association is in pasture, hay, and silage. A few large tracts have been planted to soybeans. Some parts of the Kipling soils have remained in hardwoods.

This association is suited to cotton, soybeans, grain sorghum, and small grains, and to most of the commonly grown pasture plants. When some areas are row cropped, erosion is a hazard.

Areas on Uplands Dominated by Deep Soils

Two associations in the county are made up of deep soils on uplands. These soils formed in extremely acid to slightly acid material underlain mainly by shale.

7. *Maben-Ruston-Savannah association*

Well drained to moderately well drained soils that have dominantly a loamy subsoil

This association is on long side slopes and narrow, winding ridgetops along the western edge of the county. The slopes from the ridges down to the flood plains are up to a mile in length, and up to one-fourth mile in width, and ordinarily have a gradient of more than 17 percent. Most of the ridgetops are less than one-eighth

The Savannah soils are dominantly on the narrow [illegible] and on upper parts of a few of the side slopes

for the county, but there are a few large tree farms that extend onto adjoining associations. The farms

These soils are more extensive in the northern half of this association, where the landscape is dissected with more intermittent and permanent streams and the topography is more gently sloping. These soils are moderately well drained. They have a dark-brown silt loam [illegible] thick that is underlain gray and brown and is underlain, to a depth of about 38 inches, by light brownish-gray silt loam mottled with shades of brown. The next layer, to a depth of about 60 inches, is light-gray silt loam mottled with shades of brown.

The farms in this association are about average in

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

Soil	Acres	Percent
Adaton silt loam	9, 120	3. 1
Boswell fine sandy loam, 2 to 5 percent slopes	2, 196	. 8
Brooksville silty clay, 0 to 2 percent slopes	1, 970	. 7
Brooksville silty clay, 2 to 5 percent slopes	1, 650	. 6
Catalpa silty clay loam	7, 090	2. 4
Falkner silt loam, 0 to 2 percent slopes	9, 020	3. 1
Falkner silt loam, 2 to 5 percent slopes	2, 210	. 8
Freestone fine sandy loam, 0 to 2 percent slopes	1, 930	. 7
Freestone fine sandy loam, 2 to 5 percent slopes	720	. 2
Gullied land-Sumter complex, 5 to 20 percent slopes	5, 280	1. 8
Houston silty clay	820	. 3
Kipling silty clay loam, 0 to 2 percent slopes	[illegible]	[illegible]
Prentiss silt loam, 0 to 2 percent slopes	7, 250	2. 5
Prentiss silt loam, 2 to 5 percent slopes	7, 440	2. 6
Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded	2, 800	1. 0
Providence silt loam, heavy substratum, 5 to 8 percent slopes, eroded	4, 184	1. 4
Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	980	. 3
Ruston fine sandy loam, 2 to 5 percent slopes	600	. 2
Ruston and Maben soils, 12 to 30 percent slopes	4, 120	1. 4
Savannah fine sandy loam, 2 to 5 percent [illegible]	[illegible]	[illegible]

of the B horizon. The Adaton soils are similar to Sessum soils in drainage, but the Sessum soils have more than 35 percent clay in the B horizon and are underlain by alkaline soil material at a depth of about 40 inches.

Adaton silt loam (Ad).—This soil has slopes of 0 to 2 percent.

Included with this soil in mapping were small areas [redacted]

than the Kipling soils, and also differ in that Kipling soils have a thicker solum and have a dominantly yellowish-brown B horizon.

Boswell Series

The Boswell series consists of moderately well drained

horizons are yellowish red or red. The B23t, B24t, and B25t horizons have dominant colors similar to those of the upper part of the B horizon, but they have mottles in shades of gray or brown, or in shades of red, gray, and brown. The upper part of the B horizon has gray or grayish-brown mottles at a depth below 10 inches and ranging downward to a depth of 19 to 29 inches. The B horizon is silty clay loam, clay loam, silty clay, or clay that is more than 35 percent clay in the upper 20 inches. In some horizons brown and black concretions range from few to common, and in others they are lacking. Reaction ranges from extremely acid to strongly acid.

The Boswell soils occur with Ruston, Maben, Wilcox, Kipling, Savannah, and Oktibbeha soils. The Boswell soils are less well drained and finer textured than Ruston soils. They are similar to Maben soils in the upper part of the B horizon, but they are finer textured in the lower part of the B horizon and are less well drained. The Boswell soils are better drained than the Wilcox and Kipling soils, and they are free of gray mottles in the upper part of the B horizon. They are finer textured than the Savannah soils and do not have a fragipan. They are similar to Oktibbeha soils in color, but different in that Oktibbeha soils are underlain by marly clays or chalk at depths of 24 to 54 inches.

Boswell fine sandy loam, 2 to 5 percent slopes (BoB).—This soil is on ridgetops. In some places the surface layer has been rilled and thinned by erosion and is a mixture of the original surface layer and material from the subsoil. In a few small areas the subsoil is exposed.

Included with this soil in mapping were small areas of Maben and Oktibbeha soils and of some well-drained soils that are clayey throughout the subsoil. Also included were a few small areas that have a silt loam or loam surface layer.

This soil is strongly acid to extremely acid. Permeability is very slow, and the available water capacity is high. This soil tends to shrink and crack during dry periods. Runoff is slow to medium, and where this soil is cultivated, the erosion hazard is slight to moderate. This soil is easy to till, except in areas where the subsoil

south of State Route No. 25, NE¼SE¼ sec. 11, T. 19 N., R. 15 E.

Ap—0 to 6 inches, very dark grayish-brown (2.5Y 3/2) silty clay; moderate, fine, granular and subangular blocky structure; friable to firm, plastic and sticky; common fine roots; few, fine, brown and black concretions; slightly acid; clear, smooth boundary.

A1—6 to 18 inches, very dark brown (10YR 2/2) silty clay; common, fine, faint, dark grayish-brown mottles; moderate, medium, prismatic structure parting into moderate, fine and medium, subangular blocky structure; firm, very plastic, very sticky; few to common fine roots; few, fine, brown and black concretions; slightly acid; gradual, wavy boundary.

AC1—18 to 25 inches, very dark grayish-brown (10YR 3/2) silty clay with common, fine and medium, distinct, dark-brown (10YR 4/3) and reddish-brown (5YR 4/4) mottles; moderate, medium, prismatic structures parting into moderate, fine and medium, angular blocky and subangular blocky structure; firm, very plastic, very sticky; few fine roots; few to common, fine, brown and black concretions; slightly acid; gradual, wavy boundary.

AC2—25 to 37 inches, mottled dark grayish-brown (2.5Y 4/2), yellowish-red (5YR 4/6), and dark-gray (10YR 4/1) clay; common, coarse, intersecting slickensides and parallelepipeds that have long axes tilted about 30 degrees from horizontal; moderate, fine and medium, angular blocky structure; firm, very plastic, very sticky; few fine roots; few, fine, brown and black concretions; few to common, fine to coarse, lime concretions; moderately alkaline.

C—37 to 52 inches, olive (5Y 4/3) clay; common, fine and medium, distinct, light olive-brown (2.5Y 5/4) mottles; many coarse slickensides that intersect and parallelepipeds that have long axes tilted about 40 degrees from horizontal; moderate, fine and medium, angular blocky structure; firm, very plastic, very sticky; few to common, fine, brown and black concretions; few to common, fine to coarse lime concretions; moderately alkaline.

The Ap and A1 horizons range from a very dark grayish brown to a very dark brown. Few to many distinct or promi-

soil is cultivated, the erosion hazard is slight to none. Planting is sometimes delayed in spring by wetness.

About half of this soil is in cultivation, and the rest is in pasture or hay. This soil is suited to cotton, corn, soybeans, grain sorghum, and pasture plants. It is also suited to Eastern redcedar. (Capability unit IIw-1; woodland suitability group 4c2c; wildlife suitability group 4)

Brooksville silty clay, 2 to 5 percent slopes (BrB).—This soil is gently sloping.

The surface layer is very dark grayish-brown silty clay about 6 inches thick. Below this is about 8 inches of very dark grayish-brown silty clay mottled in shades of red and brown. It is underlain by a thick clayey layer mottled in shades of brown, red, and gray.

Included with this soil in mapping were small areas of Kipling, Houston, Sumter, and Binnsville soils. In a few areas, the surface layer has been rilled and thinned

ular structure; firm, very plastic and sticky; few shiny pressure faces on peds; few fine roots and brown and black concretions; neutral; gradual, wavy boundary.

B22—26 to 35 inches, mottled dark grayish-brown (10YR 4/2), dark yellowish-brown (10YR 4/4), and gray (10YR 5/1) clay; weak, coarse, prismatic structure parting into moderate, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; shiny pressure faces on some peds; few fine roots; few to common, fine, brown and black concretions; neutral; gradual, wavy boundary.

B3—35 to 52 inches, mottled dark yellowish-brown (10YR 4/4), gray (10YR 5/1), and yellowish-brown (10YR 5/6) silty clay; weak, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; shiny pressure faces on peds; few to common, fine, brown and black concretions; few fine lime nodules; mildly alkaline.

The Ap and A1 horizons are very dark grayish brown or dark brown. The A horizon ranges from 10 to 24 inches in thickness. The B horizon is dark grayish brown, dark brown,

to a depth of about 27 inches by a yellowish-brown silty clay loam that is mottled in the lower part with brown, red, and gray. Below this is silty clay or clay mottled with red, brown, and gray to a depth of about 64 inches, and next lower in the profile is shale in horizontal plates.

Representative profile of Falkner silt loam in an idle field, about 3½ miles southwest of Starkville, one-half mile southeast of State Route No. 12, on south bank of urban road, SE¼NW¼ sec. 18, T. 18 N., R. 14 E.

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

B21t—6 to 18 inches, yellowish-brown (10YR 5/4) silty clay loam; common, fine and medium, distinct, pale-brown (10YR 6/3) and light brownish-gray (10YR 6/2) mottles; moderate, fine and medium, subangular blocky structure; friable, slightly plastic and sticky; few fine roots; few to common, fine, brown and black concretions; few worm and root holes filled with material from the Ap horizon; patchy clay films

Included with this soil in mapping were small areas of Wilcox, Longview, and Adaton soils. Also included were a few small areas of soils that have a clayey layer below 30 inches. In a few small areas the surface layer is thinned by erosion, and this layer is a mixture of the surface layer and subsoil.

This is a strongly acid to very strongly acid soil. Permeability of the upper part of the subsoil is moderate, but water moves slowly through the clayey layer. The available water capacity is high. The soil tills easily, but tends to crust and pack when left idle. A plowpan forms readily if depth of plowing is not varied.

Approximately 40 percent of this soil has been cleared and is in pasture and hay, and minor areas are in cultivation. The rest is in woodland. Runoff is slow, and wetness often slows seedbed preparation in spring. This soil is suited to cotton, soybeans, grain sorghum, corn, small grain, pasture plants, adapted hardwoods, and pine trees. (Capability unit IIIw–2; woodland suitability group 2w8; wildlife suitability group 5)

line, and one-half mile south of U.S. Highway No. 82, opposite turnoff road to Oktibbeha Airport, 250 feet southeast of NW. corner, NW¼SE¼ sec. 36, T. 19 N., R. 15 E.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) fine sandy loam; few, fine, distinct, dark-brown mottles; weak, fine, granular structure; friable; common fine roots; medium acid; clear, smooth boundary.

B21t—5 to 15 inches, yellowish-brown (10YR 5/6) loam; few to common, fine, distinct, light-gray and yellowish-red mottles; weak to moderate, medium to fine, subangular blocky structure; friable; common worm channels filled with dark grayish-brown materials from above; common fine roots; patchy clay films on peds; strongly acid; clear, wavy boundary.

B22t—15 to 22 inches, mottled yellowish-brown (10YR 5/6), gray (10YR 6/1), and red (2.5YR 4/6) clay loam; moderate, medium, subangular and angular blocky structure; firm, slightly sticky, slightly plastic; patchy clay films on ped faces; few fine roots; strongly acid; clear, smooth boundary.

B23tg—22 to 40 inches, gray (10YR 6/1) clay loam; common to many, medium, prominent, yellowish-brown (10YR 5/6) and red (2.5YR 4/8) mottles; moderate, medium, subangular and angular blocky structure; firm, sticky and plastic; patchy clay films on ped faces; few fine roots; strongly acid; gradual, smooth boundary.

B3tg—40 to 60 inches, mottled gray (10YR 6/1) and yellowish-brown (10YR 5/8) clay loam; weak, medium, subangular and angular blocky structure; firm, sticky and plastic; patchy clay films on peds; bridging and coating of sand grains; strongly acid.

The Ap horizon is dark grayish brown, brown, or dark brown and it is a fine sandy loam or loam. In a few undisturbed wooded areas there is a A1 horizon 1 to 3 inches thick that ranges from dark gray to very dark gray. The B21t horizon is dominantly yellowish brown with few to common mottles in shades of gray, brown, and red. In some profiles the yellowish-red or red mottles are lacking in the B21t horizon, which is dominantly loam but ranges to sandy loam. The B22t and B23tg horizons are mottled in shades of yellow, brown, gray, and red, or below a depth of 20 inches have gray dominant colors and few to many mottles in shades of red and yellow. The B22t horizon is dominantly clay loam, but ranges to sandy clay loam. Clay content of this horizon ranges from 27 to 35 percent. The B3tg horizon is mottled in shades of gray, yellow, and brown, and textures are similar to those in the B22t and B23tg horizons. Brown and black concretions are few to common. Reaction of these soils ranges from strongly acid to very strongly acid, except where the surface has been limed.

The Freestone soils occur with the Kipling, Stough, Prentiss, and Falkner soils. The Freestone soils are less clayey than the Kipling soils in the upper 20 inches of the B horizon. The Freestone soils are finer textured than the Stough and Prentiss soils and do not have a fragipan. The Freestone soils are less well drained than the Prentiss soils. They differ from the Falkner soils in that the Falkner soils have less than 15 percent sand coarser than fine sand in the upper 20 inches of the B horizon.

Soil tilth can be maintained and crusting and packing reduced by proper management of crop residue.

Most of this soil is in pasture or in hay. The rest is in woodland. This soil is suited to cotton, corn, soybeans, small grain, pasture plants, and pine trees. (Capability unit IIw–3; woodland suitability group 2w8; wildlife suitability group 5)

Freestone fine sandy loam, 2 to 5 percent slopes (FrB).—This gently sloping soil occurs on side slopes.

The surface layer is dark grayish-brown fine sandy loam about 5 inches thick. The upper part of the subsoil, about 10 inches thick, is yellowish-brown loam with gray mottles. It is underlain at a depth of 15 to 28 inches by clay loam mottled in shades of yellow, gray, red, and brown.

Included with this soil in mapping were small areas of Kipling, Stough, and Prentiss soils. In a few areas the surface layer has been thinned by erosion, and where these are plowed, the surface layer is a mixture of the original surface soil and material from the subsoil. Also included were a few areas that have a loam surface layer.

This soil is strongly acid to very strongly acid. Permeability is moderately slow in the upper part of the subsoil and slow through the lower part of the subsoil. The available water capacity is medium. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight to moderate. Soil tilth can be maintained and the erosion hazard can be reduced by proper management of crop residue.

Most of this soil is in pasture or in hay. The rest is in woodland. This soil is suited to soybeans, grain sorghum, cotton, corn, pasture, and pine trees. (Capability unit IIIe–1; woodland suitability group 2w8; wildlife suitability group 5)

Gullied Land

Gullied land is so eroded that only narrow, isolated areas of the original soils remain between the gullies. The original soils were mostly of the Sumter series. The gullies range from about a quarter of an acre to several acres in size. In some areas all the soil material has been removed and chalk outcrop is exposed.

Gullied land-Sumter complex, 5 to 20 percent slopes (GsE).—This complex occupies areas that are strongly sloping to moderately steep. Deep gullies in an intricate pattern make up about 30 to 60 percent of most areas. The Sumter soils, which make up 20 to 40 percent, occur as isolated spots, and narrow fingerlike extensions of the original soil remain between the gullies (fig. 2). Binns-

horizontal; firm, very plastic, very sticky; few fine

a silty clay mottled by shades of red, brown, and gray; and this is underlain by firm chalk.

Representative profile of Kipling silty clay loam in a pasture located about 0.9 miles north of U.S. Highway No.

soils and have gray mottles in the upper 10 inches of the B horizon that do not occur in the Oktibbeha and Boswell soils. The Kipling soils differ from the Brooksville and Houston soils in that the Brooksville and Houston soils have a thick, dark-colored A horizon that has intersecting

of the original surface layer with subsoil. A few fields have a few small gullies or rills that expose the subsoil. The subsoil is mottled in shades of yellow, red, and gray and is a silty clay or clay.

Included with this soil in mapping were small areas of Oktibbeha and Sumter soils, and a few areas of a mottled sandy clay loam. In a few areas the firm calcareous material is within 2 feet of the surface. Also included were a few small areas that have a loam or sandy clay loam surface layer, and some with slopes up to 12 percent.

This soil is strongly acid to very strongly acid. Permeability is slow to very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. Runoff is medium, and where this soil is cultivated, the erosion hazard is moderate. Tilth is poor but can be improved by plowing late in fall and making proper use of crop residue and soil-improving crops.

Most of this soil is in pasture or in cultivation. The rest is in scrubby woodland. Soybeans, grain sorghum, small grains, pasture plants, and pine trees are suitable. Because of slope and the erosion hazard, this soil is dominantly in pasture and in trees. (Capability unit IVe-2; woodland suitability group 2c8; wildlife suitability group 4)

Kipling and Sumter soils, 17 to 40 percent slopes, severely eroded (KsF3).—These soils are in the eastern part of the county. They formed in acid to calcareous soil materials. They do not occur in a uniform pattern, but one or both of the two major soils are in all areas mapped. The size of areas ranges from 20 to 600 acres.

The Kipling soils and Sumter soils are dominant. Included are lesser amounts of Maben, Ruston, and Oktibbeha soils, and some areas of a moderately well drained soil that has a dark yellowish-brown to yellowish-brown subsoil. Marietta soils are in the narrow alluvial areas.

The erosion is variable, but in most areas the surface layer has been thinned and the subsoil is exposed. In most areas there are a few deep gullies.

The Kipling soils occur on the narrow ridges and on the side slopes. They have a yellowish-brown silty clay upper subsoil that is underlain by mottled clay.

These soils are strongly acid to very strongly acid. Permeability is slow to very slow. The available water capacity is high. During dry periods these soils shrink and crack.

The Sumter soils occur on a few of the narrow ridges and on many of the side slopes. They have a calcareous, olive, clayey subsoil that is underlain by firm, marly clay or by chalk. These soils are mildly alkaline to moderately alkaline. Permeability is slow. The available water capacity is medium.

Most of the acreage of these soils is in cutover woodland, and some is in pasture. Because of slope, rapid runoff, and severe erosion hazard, these soils should be kept in permanent vegetation. They are suited to most commonly grown pasture plants. The acid soils are not suited to sweetclover and black medic, but they are suited to pine trees and adapted hardwood. Cedar trees and

Leeper Series

The Leeper series consists of somewhat poorly drained, medium acid to moderately alkaline soils. These soils formed in clayey alluvium on flood plains.

In a representative profile, the surface layer is very dark grayish-brown silty clay loam, about 5 inches thick, that is underlain to a depth of 9 inches by a very dark gray silty clay. Below this, to a depth of about 42 inches, is a mottled brownish clay or dark-gray silty clay loam mottled with shades of brown. Under this is a mottled dark-gray, yellowish-brown, and strong-brown clay loam.

Representative profile of Leeper silty clay loam in a cultivated area approximately 6 miles east of State College, out Blackjack Road, 150 feet south of Sand Creek Canal and 75 feet east of gravel road, NW¼NE¼ sec. 11, T. 18 N., R. 15 E.

Ap—0 to 5 inches, very dark grayish-brown (2.5Y 3/2) silty clay loam; moderate, fine and medium, granular and subangular blocky structure; friable, plastic and sticky; common fine roots; few, fine, brown and black concretions; moderately alkaline; clear, smooth boundary.

A1—5 to 9 inches, very dark gray (10YR 3/1) silty clay; few, fine, faint, dark yellowish-brown mottles; moderate, fine and medium, subangular blocky and granular structure; friable to firm, plastic and sticky; few fine roots and brown and black concretions; few cracks filled with material from the Ap horizon; mildly alkaline; clear, smooth boundary.

B21—9 to 26 inches, mottled dark grayish-brown (10YR 4/2), dark-brown (7.5YR 4/4), and dark yellowish-brown (10YR 4/4) clay; moderate, fine and medium, subangular and angular blocky structure; firm, very plastic and sticky; few fine roots and brown and black concretions; common pressure faces on peds; some Ap material in root channels and cracks; mildly alkaline; gradual, wavy boundary.

B22g—26 to 42 inches, dark-gray (10YR 4/1) silty clay loam; many, fine and medium, distinct, dark grayish-brown (10YR 4/2), dark yellowish-brown (10YR 4/4), and strong-brown (7.5YR 5/6) mottles; moderate, fine, subangular and angular blocky structure; firm, very plastic and sticky; few fine roots; common, fine, brown and black concretions; few coarse slickensides or pressure faces; mildly alkaline; gradual, wavy boundary.

Cg—42 to 53 inches, mottled dark-gray (10YR 4/1), yellowish-brown (10YR 5/4), and strong-brown (7.5YR 5/6) clay loam; structureless; massive; firm, very plastic and sticky; common to many, fine, brown and black concretions; common pressure faces on peds; mildly alkaline.

The Ap and A1 horizons are very dark grayish brown or very dark gray. Where the soil, when moist, has value of 3.5 or less, the A horizon is less than 10 inches in thickness. The B horizon is dark grayish brown or dark gray in the lower part, or it is mottled in shades of gray, brown, and yellow. The B and C horizons are silty clay, clay, silty clay loam, or clay loam. The clay content ranges from 35 to 60 percent between a depth of 10 and 40 inches. Brown and black concretions range from few to many, and some profiles contain lime concretions in the lower horizons. Reaction ranges from medium acid to moderately alkaline.

The Leeper soils occur with the Catalpa, Marietta, and Urbo soils. The Leeper soils have a less thick dark surface horizon that the Catalpa soils and are not so well drained. The Leeper soils are finer textured than the Marietta soils

Included with this soil in mapping were small areas of Marietta and Catalpa soils. Some areas near stream channels and foothills have up to 10 inches of loamy overwash material. Some more poorly drained soils occur in a few low areas.

This soil ranges from medium acid to moderately alkaline. Its permeability is slow. It shrinks and cracks during dry periods. The available water capacity is high. Runoff is slow, and there is ponding in some low areas. Proper use of crop residue should be practiced in order to maintain soil tilth and to help prevent crusting and packing.

Most of this soil is in cultivation, in pasture, or hay. The rest is in cutover hardwoods. Crops may be damaged by flooding. This soil is well suited to suited to cotton, corn, soybeans, grain sorghum, small grain, pasture plants, and adapted hardwoods. (Capability unit IIw-2; woodland suitability group 1w6; wildlife suitability group 1)

Longview Series

The Longview series consists of somewhat poorly drained, strongly acid to very strongly acid soils that have a fragipan. These soils formed in loamy materials high in silt. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is grayish-brown silt loam about 4 inches thick, that is underlain to a depth of about 18 inches by a yellowish-brown silt loam mottled with shades of gray. Below this, to a depth of about 55 inches, is a firm, compact and brittle silt loam mottled with shades of brown and gray. This silt loam is underlain to a depth of about 72 inches by a light-gray silty clay loam.

Representative profile of Longview silt loam in a wooded area about 4½ miles southwest of Starkville, 366 yards east of State Route No. 25, 35 feet south of field road, and 50 feet southwest of northeast corner of NE¼NW¼ sec. 32, T. 18 N., R. 14 E.

Ap—0 to 4 inches, grayish-brown (10YR 5/2) silt loam; few, fine, distinct, yellowish-brown mottles; weak, fine and medium, granular structure; friable; common fine and medium roots; few, fine, brown concretions; very strongly acid; clear, smooth boundary.

B1—4 to 9 inches, yellowish-brown (10YR 5/4) silt loam; few, fine, distinct, light brownish-gray mottles; weak, medium, subangular blocky structure; friable; few, fine and medium roots; few, fine, black and brown concretions; very strongly acid; clear, smooth boundary.

B21—9 to 18 inches, yellowish-brown (10YR 5/6) silt loam; common, fine and medium, distinct, light-gray (10YR mottles; moderate, medium, prismatic structure parting to weak to moderate, fine and medium, subangular blocky structure; firm, compact and brittle; few fine roots; few, fine, brown and black concretions; few patchy clay films on peds; few clean sand grains; very strongly acid; gradual, wavy boundary.

B22tg—55 to 72 inches, light-gray (10YR 6/1) silty clay loam; few to common, fine and medium, distinct, yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, fine and medium, subangular blocky structure; firm, plastic and slightly sticky; few fine roots; few, fine, brown and black concretions; clay films on some peds and in pores; gray silt coats on some prisms; very strongly acid.

The Ap horizon is grayish brown, dark brown, or brown and is dominantly silt loam with some areas of loam. In some undisturbed wooded areas there is an A1 horizon, 1 to 3 inches thick, that is very dark grayish brown or dark grayish brown. The B horizon above the fragipan is dominantly yellowish brown but ranges to brown or pale brown and has few to many grayish mottles in the upper 10 inches. The B horizon is dominantly silt loam having a clay content ranging from 18 to 27 percent and a silt content ranging from 52 to 75 percent. The Bx and B22tg horizons are dominantly shades of gray, have common to many yellow and brown mottles or shades of gray, yellow, and brown, and have a silt loam to silty clay loam texture and a clay content of 18 to 35 percent. The Bx horizon ranges from 15 to 26 inches in depth. Reaction of these soils ranges from strongly acid to very strongly acid except in areas that have received lime.

The Longview soils occur with Falkner, Stough, Prentiss, and Providence soils. The Longview soils differ from the Falkner soils in that the Falkner soils lack a fragipan and have a clayey layer in the lower part of the B horizon. The Longview soils are finer textured and more silty than the Stough and Prentiss soils. They are not so well drained as the Providence soils, which lack gray mottles in the upper part of the B horizon.

Longview silt loam, 0 to 2 percent slopes (LoA).—This is a nearly level soil on broad upland areas.

Included with this soil in mapping were small areas of Falkner, Prentiss, Stough, and Adaton soils and a few areas of a soil that has similar drainage but is less clayey in the subsoil above the fragipan.

This soil is strongly acid to very strongly acid. Permeability of the subsoil is moderate, but moisture moves slowly through the fragipan. The available water capacity is medium. Runoff is slow. The soil works fairly well but crusts and packs when left without a plant cover.

Approximately one-third of this soil has been cleared and is in pasture or in hay crops. A large part of the rest is in scrubby black jack oaks and in other hardwoods; however, some areas have good stands of pine timber (fig. 3). Surface runoff is slow, and wetness often delays seedbed preparation in spring. This soil is fairly well

stratified sands and clays. Slopes range from 5 to 30 percent.

In a representative profile, the surface layer is dark-

B horizon. The Maben soils are finer textured than the Savannah soils and do not have a fragipan.

Maben fine sandy loam, 5 to 8 percent slopes, eroded (MbC2).—This soil occurs on ridgetops and side slopes.

The surface layer is brown fine sandy loam about 4 inches thick. In most areas the surface layer has been rilled and thinned by erosion and is a mixture of the original surface layer and material from the subsoil. In some fields there are a few shallow gullies. The upper part of the subsoil, about 20 inches thick, is yellowish-red or red clay or clay loam that is underlain by stratified layers of sands and clays that are rich in mica and shale fragments.

Included with this soil in mapping were small areas of Boswell, Ruston, and Wilcox soils and a few severely

capacity is medium to high. Runoff is rapid, and if these soils are cultivated, the erosion hazard is moderate. Proper use of crop residue and soil-improving crops should be practiced to reduce the erosion hazard and to maintain tilth. These soils tend to crust and pack if left idle.

Most of this mapping unit has remained in woodland, but some is in pasture. Small grains, pasture, and pine trees are suitable. Because of slope, rapid runoff, and erosion, pasture and trees are particularly suitable. (Capability unit IVe-3; woodland suitability group 3c2; wildlife suitability group 6)

Maben and Ruston soils, 12 to 30 percent slopes (MrF).—This mapping unit consists dominantly of well-drained Maben and Ruston soils. These soils occur on

Representative profile of Mantachie loam, in pasture approximately ¾ mile southeast of Sturgis, 500 feet east of blacktop road, and 400 feet south of Sand Creek, SW¼SW¼ sec. 15, T. 17 N., R. 12 E.

Ap—0 to 8 inches, mottled dark-brown (10YR 4/3), yellowish-brown (10YR 5/5), and grayish-brown (2.5Y 5/2) loam; weak, fine, granular structure; friable; many fine roots; few, fine, brown and black concretions; strongly acid; clear, smooth boundary.

B21—8 to 19 inches, mottled yellowish-brown (10YR 5/4, 5/8) and light brownish-gray (10YR 6/2) loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; common, fine, brown and black concretions; very strongly acid; gradual, smooth boundary.

suited to cotton, corn, small grain, soybeans, pasture, pine trees, and adapted hardwoods. Crops can be damaged by flooding. (Capability unit IIw-4; woodland suitability group 1w9; wildlife suitability group 2)

Marietta Series

The Marietta series consists of moderately well drained, medium acid to moderately alkaline soils. These soils formed in mixed loamy alluvium.

In a representative profile, the surface layer is dark grayish-brown fine sandy loam about 6 inches thick. This is underlain to a depth of about 15 inches by yellowish-brown loam. Below this, to a depth of about

less clay. Also included were some areas having up to 18 inches of material that ranges from loam to fine sandy loam and from strongly acid to moderately alkaline.

This soil is medium acid to moderately alkaline. Permeability of the surface layer and subsoil is mod-

mottles of grayish brown or gray. The lower parts of the Bg horizon are dominantly grayish brown to gray and have few to many mottles in shades of gray, brown, or yellow. The B horizon is silt loam or silty clay loam. The clay content at a depth of 10 to 40 inches ranges from 18 to 30 percent. In the upper part of the B horizon, most areas of

strong-brown mottles; weak, medium, subangular blocky structure; firm; few fine roots; few, fine, brown and black concretions; patchy clay films on ped faces; some sand grains that have clay bridges and coats; few fine voids; very strongly acid; gradual, wavy boundary.

B22tg—18 to 38 inches, light brownish-gray (10YR 6/2) silt loam; common to many, fine and medium, distinct, yellowish-brown (10YR 5/6) and light yellowish-brown (10YR 6/4) mottles and few, fine, distinct, strong-brown mottles; weak to moderate, fine and medium, subangular blocky structure; firm, slightly plastic; few fine roots; few, fine, brown and black concretions; patchy clay films on ped faces; sand grains have clay bridges and coats; common fine pores; few gray silt coats on ped faces; very strongly acid; gradual, wavy boundary.

B23tg—38 to 60 inches, light-gray (10YR 6/1) silt loam; few

loam. Below this, to a depth of about 52 inches, is a loam mottled with shades of brown and gray.

Representative profile of Ochlockonee loam, in a cultivated area about 400 feet south of the Noxubee River and 40 feet west of Morgantown Road, NW¼NW¼ sec. 31, T. 17 N., R. 13 E.

Ap—0 to 7 inches, dark-brown (10YR 4/3) loam; weak, fine, granular structure; very friable; common fine roots; few, fine, brown and black concretions; strongly acid; clear, smooth boundary.

C1—7 to 20 inches, yellowish-brown (10YR 5/4) sandy loam with few, fine, faint, pale-brown mottles; structureless; massive; friable; few fine roots; few, fine, brown and black concretions; few wormholes filled with material from Ap horizon; few sand pockets; strongly acid; gradual, smooth boundary.

Most of this soil is cultivated or in hay. The rest is in bottom-land hardwoods or pasture. If properly managed and fertilized, this soil is well suited to cotton, corn, soybeans, small grain, pasture, and truck crops. Crops may be damaged by flooding. Pine trees and adapted hardwoods are well suited. (Capability unit IIw-6; woodland suitability group 2o7; wildlife suitability group 2)

Oktibbeha Series

The Oktibbeha series consists of moderately well drained soils that formed in beds of acid clays overlying marly clays or chalk. Slopes range from 2 to 17 percent.

In a representative profile, the surface layer is mixed dark grayish-brown and dark-brown silty clay loam about 4 inches thick. This silty clay is underlain to a depth of about 16 inches by a red or yellowish-red clay. Below this, to a depth of about 34 inches, is clay or silty clay mottled with shades of red, brown, and gray. This material is underlain by a marly clay mottled with shades of brown, gray, and yellow. Chalk is at a depth of about 45 inches.

R—45 to 60 inches, very firm chalk in fine to coarse horizontal plates.

The Ap horizon is dominantly dark grayish-brown, dark brown, or brown and ranges from silty clay loam or silt loam to fine sandy loam. The B21t and B22t horizons are red to yellowish red, and some profiles have few to common mottles in shades of brown. The B23t and B3 horizons have matrix colors of strong brown or yellowish brown and common to many mottles in shades of gray, olive, and red, or brown, gray, red, and olive. The B2t horizon is silty clay or clay, and common to many slickensides are within the upper 40 inches. The depth to the marly clay or chalk ranges from 24 to 54 inches. Reaction of these soils ranges from strongly acid to very strongly acid through the B2 and the B3 horizons. Reaction in the C horizon ranges from slightly acid to moderately alkaline.

These soils are less clayey than is defined as the range for the Oktibbeha series, but this difference does not alter their usefulness and behavior.

The Oktibbeha soils occur with Kipling, Sumter, and Boswell soils. The Oktibbeha soils have less yellow in the B horizon than the Kipling soils, which have gray mottles in the upper B horizon. They differ from the Sumter soils in that the Sumter soils have a pale-olive B horizon with more than 40 percent calcium carbonates in the upper 40 inches. The Oktibbeha soils differ from the Boswell soils in that the Boswell soils are more acid throughout, have a thicker B horizon, and lack the calcareous underlying material.

that has an acid, yellowish-red subsoil underlain by chalk at depths of less than 20 inches. A few areas have a sandy loam or loam surface layer. Also included were a few areas that are severely eroded that have many shallow gullies.

This soil is very strongly acid to strongly acid. Permeability is slow to very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. Runoff is medium, and if this soil is culti-

Oktibbeha Series, Thick Solum Variant

The thick solum variant of the Oktibbeha series consists of moderately well drained soils on uplands. These soils formed in beds of strongly acid to very strongly acid clay. Slopes range from 5 to 8 percent.

In a representative profile, the surface layer is dark-brown fine sandy loam about 4 inches thick. This sandy loam is underlain by yellowish-red loam to a depth of

These soils are variants to the Oktibbeha series because they have less clay in the B horizon and have lower shrink-swell properties and a thicker solum.

The Oktibbeha thick solum variants occur with Kipling and Mahan soils. These variants differ from the Kipling soils

and medium, subangular blocky structure; friable; few fine roots; few brown and black concretions; some clay bridging on a few sand grains; strongly acid; clear, wavy boundary.

water capacity is medium. The soil has good tilth and can be worked throughout a wide range of moisture content. Runoff is slow, and if this soil is cultivated, the erosion hazard is slight to none. The soil has a tendency to crust and pack when left idle.

About 75 percent of this soil is in row crops or pasture. The rest is in cutover hardwoods and pine trees. This soil is well suited to cotton, corn, soybeans, small grains, pasture, adapted hardwoods, and pine trees. (Capability unit IIw-7; woodland suitability group 2o7; wildlife suitability group 5)

Prentiss silt loam, 2 to 5 percent slopes (PnB).—This moderately well drained soil occurs on terraces and uplands.

The surface layer is dark-brown or dark grayish-brown silt loam about 4 inches thick. The upper part of the subsoil, about 15 inches thick, is yellowish-brown silt loam. This silt loam is underlain at a depth of 19 to 26 inches by a thick, mottled, gray, brown, and yellow fragipan.

Included with this soil in mapping were small areas of Savannah soils and Providence soils, heavy substratum. In a few small areas the surface layer has been rilled and thinned by erosion and is a mixture of the original surface layer with subsoil material. Also included were a few areas in the south-central part of the county where the surface layer is fine sandy loam.

This soil is strongly acid to very strongly acid. Permeability is moderate in the upper part of the subsoil but moderately slow through the fragipan. The available

brown mottles; weak, fine, granular structure; friable; common fine and medium roots; few, fine, brown and black concretions; some mixing with lower horizon; medium acid; clear, smooth boundary.

B21t—4 to 16 inches, strong-brown (7.5YR 5/6) silty clay loam; moderate, fine and medium, subangular blocky structure; friable to firm, slightly plastic and slightly sticky; few, fine and medium roots; few, fine and medium, brown and black concretions; patchy clay films on ped faces; some Ap horizon mixed in upper 3 inches; very strongly acid; clear, smooth boundary.

B22t—16 to 21 inches, yellowish-brown (10YR 5/6) silty clay loam; few, fine and medium, distinct, pale-brown (10YR 6/3) and strong-brown (7.5YR 5/6) mottles; moderate, fine and medium, subangular blocky structure; friable to firm, slightly plastic and slightly sticky; few fine and medium roots; common, fine and medium, brown and black concretions; patchy clay films on ped faces; very strongly acid; clear, wavy boundary.

Bx1—21 to 34 inches, yellowish-brown (10YR 5/4) silty clay loam; common, fine and medium, distinct, light brownish-gray (10YR 6/2) and strong-brown (7.5YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, fine and medium, subangular blocky structure; firm, compact and brittle, slightly plastic and slightly sticky; few fine roots; few to common, fine and medium, brown and black concretions; few fine voids; patchy clay films on ped faces; some sand grains bridged and coated; very strongly acid; gradual, wavy boundary.

Bx2—34 to 45 inches, light brownish-gray (2.5YR 6/2) silty clay loam; common to many, fine and medium, distinct, yellowish-brown (10YR 5/4) and strong-brown (7.5YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, fine and medium, subangular blocky structure; firm, compact and brittle,

Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded (PsB2).—This is a moderately well

cent slopes, severely eroded (PsC3).—This moderately well drained soil is on side slopes.

B2t—15 to 32 inches, yellowish-red (5YR 4/6) sandy clay loam; moderate, fine and medium, subangular blocky structure; friable; few streaks of A2 horizon in root channels; few fine and medium roots; patchy clay films on peds; sand grains coated with clay; very strongly acid; gradual, smooth boundary.

B3—32 to 43 inches, strong-brown (7.5YR 5/6) loam; few fine to coarse spots and streaks of yellowish brown (10YR 5/6) and pale brown (10YR 6/3); weak, fine and medium, subangular blocky structure; friable; few fine roots; patchy clay films, mostly in strong-brown areas; some clay bridging of sand grains; very strongly acid; gradual, wavy boundary.

B3&A'2—43 to 55 inches, strong-brown (7.5YR 5/6, 5/8) sandy loam; few, fine to coarse, vertical streaks and pockets of light yellowish brown (10YR 6/4) and light gray (10YR 6/1); weak, fine, granular structure and single grain; very friable to loose; few fine roots; some bridging of sand grains in dark yellowish-brown areas and clean sand in gray areas; very strongly acid; clear, irregular boundary.

B'21t—55 to 67 inches, yellowish-red (5YR 5/8) sandy loam; common, fine to coarse streaks and pockets of light yellowish brown (10YR 6/4) and light gray (10YR 6/1); weak to moderate, fine and medium, subangular blocky structure; firm; few fine roots; patchy clay films on ped faces; sand grains bridged and coated with clay; gray sand coats on many ped faces; very strongly acid; clear, irregular boundary.

B'22t—67 to 80 inches, mottled brownish-yellow (10YR 6/8), yellowish red (5YR 5/8), and light-gray (10YR 7/1) loam; moderate, fine and medium, subangular blocky structure; firm; patchy clay films on ped faces; very strongly acid.

The Ap horizon is brown, dark brown, or yellowish brown. The A2 ranges from pale brown or grayish brown to brown. The B1 horizon, when present, is yellowish brown or strong brown and is fine sandy loam or loam. The B2t horizon is yellowish red, red, or reddish yellow and ranges from sandy loam to clay loam, but is dominantly sandy clay loam. The B3, or B3 & A'2, layer. Where present, is at a depth of about 30 to 48 inches, is strong brown with pockets in shades of brown and gray, and is dominantly sandy loam. The colors of the B'2t are similar to those of the B2t, or the horizon is mottled in red, gray, and yellow. The B'2t horizon is sandy loam to sandy clay loam. Reaction of these soils ranges from medium acid to very strongly acid.

The Ruston soils occur with Boswell, Maben, and Savannah soils. The Ruston soils are less clayey in the B2t horizon than the Boswell and Maben soils. More than 35 percent of the upper part of the B2t horizon of the Boswell and Maben soils is clay. The Ruston soils are less yellow than the Savannah soils and do not have a fragipan.

Ruston fine sandy loam, 2 to 5 percent slopes (RtB).—This is a well-drained soil on ridgetops.

Included with this soil in mapping were small areas of Maben and Savannah soils. Also included were some areas of soils having slopes of up to 8 percent. In a few cultivated areas, the surface layer has been thinned by erosion, and where this has occurred, this layer is a mixture of the original surface layer with material from the subsoil.

This soil is very strongly acid to medium acid. Permeability is moderate, and the available water capacity is medium. Runoff is slow to medium, and if this soil is cultivated, the erosion hazard is slight. This soil tills easily and can be worked throughout a wide range of moisture content. This soil tends to crust and pack when left bare.

Most of this soil has been cultivated in the past. Some has been allowed to revert to mixed hardwoods and pine trees, and a few small areas are in orchards. This soil is well suited to cotton, corn, soybeans, grain sorghum, small grains, pasture, orchards, truck crops, and pine trees. (Capability unit IIe-3; woodland suitability group 3o1; wildlife suitability group 6)

Ruston and Maben soils, 12 to 30 percent slopes (RuE).—These soils are well drained and occur on narrow ridgetops and long side slopes. Some areas are made up of Ruston fine sandy loam, some of Maben fine sandy loam, and some of a combination of the two.

The Ruston soils make up about 33 percent of this mapping unit, and the Maben soils make up about 19 percent. The rest is made up of soils that are similar to the Ruston soils but differ in having a thinner subsoil, and of other soils that have a sandy loam surface layer more than 20 inches thick and a yellowish-red to strong-brown subsoil. In the narrow flood plains are Mantachie and Ochlockonee soils.

The pattern and extent of Ruston and Maben soils are not very uniform in this mapping unit. Both soils usually occur in all areas, but in some areas only one of these soils occurs with one or more of the minor soils.

Included with these soils in mapping were a few eroded areas that were once cultivated.

The Ruston soil occurs dominantly on the upper and middle side slopes, but in some places is on the narrow ridgetops. The surface layer is a dark-brown fine sandy loam, about 5 inches thick, and is underlain by a yellowish-red clay loam subsoil. This soil is medium acid to very strongly acid. Permeability is moderate, and the available water capacity is medium. Runoff is rapid.

The Maben soil generally occurs on the middle and lower side slopes, but in some places is on the narrow ridgetops. The surface layer is a dark grayish-brown fine sandy loam about 4 inches thick. The upper part of the subsoil, about 16 inches thick, is yellowish-red clay to clay loam. Below this is a red loam to a depth of about 41 inches, which is underlain by stratified layers of sands and clays with remnants of acid shale. This soil is slightly acid to very strongly acid. Permeability is moderately slow. The available water capacity is medium to high.

The soils of this mapping unit are wooded for the most part, but a few of the ridgetops and upper side slopes have been cultivated in the past. Because of slope, rapid runoff, and the high erosion hazard, these soils should be kept in permanent vegetation such as pine trees and in adapted hardwoods. (Both soils, capability unit VIIe-3; Ruston part, woodland suitability group 3o1, Maben part, woodland suitability group 3c2; both soils, wildlife suitability group 6)

Savannah Series

The Savannah series consists of moderately well drained, strongly acid or very strongly acid soils with a fragipan. These soils formed in loamy materials. Slopes range from 2 to 12 percent.

In a representative profile, the surface layer is dark grayish-brown fine sandy loam about 4 inches thick. It is underlain by a strong-brown loam that reaches to a depth of about 22 inches. Below this is a firm, compact, brittle, yellowish-brown loam that is mottled in shades of gray and brown and extends to a depth of more than 60 inches.

Representative profile of Savannah fine sandy loam in a pasture about 11 miles south of Starkville, 2 miles west of State Route 25, half a mile north of Craig Springs Road, and 300 yards west of gravel road, SE¼NW¼ sec. 21, T. 17 N., R. 13 E.

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) fine sandy loam; common, fine and medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine, granular structure; very friable; few to common, fine and medium roots; few, fine, brown and black concretions; few worm casts; some mixing with upper part of B2t horizon; strongly acid; clear, smooth boundary.

B21t—4 to 16 inches, strong-brown (7.5YR 5/6) loam; few, fine and medium, distinct, yellowish-brown mottles (10YR 5/6); moderate, fine and medium, subangular blocky structure; friable; few, fine and medium roots; few, fine, brown and black concretions; sand grains bridged and coated with clay; patchy clay films in pores and on ped faces; very strongly acid; gradual, wavy boundary.

B22t—16 to 22 inches, strong-brown (7.5YR 5/8) loam; few to common, fine and medium, distinct, yellowish-brown (10YR 5/6) and pale-brown (10YR 6/3) mottles; moderate, fine and medium, subangular blocky structure; friable; few fine roots; few to common, fine and medium, brown and black con-

soils are underlain at a depth of 30 to 48 inches by a clayey layer.

Savannah fine sandy loam, 2 to 5 percent slopes, eroded (SaB2).—This is a gently sloping soil on ridgetops. It has the profile described as representative for the series. A few shallow gullies or rills occur in a few fields.

Included with this soil in mapping were small areas of Prentiss, Ruston, and Providence soils, and a few small areas that have a fragipan, 8 to 20 inches thick, that overlies a thick clayey layer. Also included were a few areas that have a loam or silt loam surface layer.

This soil is very strongly acid to strongly acid. Permeability is moderate in the upper part of the subsoil, but moderately slow through the fragipan. The available water capacity is medium. Runoff is slow, and if this soil is cultivated, the erosion hazard is slight to moderate. This soil is easily tilled, but proper use of crop residue should be practiced to maintain tilth and prevent crusting and packing. A plowpan may form if depth of plowing is not varied.

Most of this soil has been cultivated in the past, and some has been allowed to revert to woodland. Most of it is in pasture, and small areas are in cultivation. This

The surface layer is dark grayish-brown or brown fine sandy loam about 3 inches thick. In most areas the surface layer has been thinned and rilled by erosion. In a few areas there are a few deep gullies. The upper part of the subsoil, about 16 inches thick, is strong-brown clay loam. This is underlain at a depth of about 19 inches by a thick, mottled, gray, yellow, and brown fragipan.

Included with this soil in mapping were small areas of Wilcox, Boswell, Ruston, and Prentiss soils.

This soil is very strongly acid to strongly acid. Permeability is moderate in the upper part of the subsoil but moderately slow through the fragipan. The available water capacity is medium. Runoff is rapid, and where this soil is cultivated, the erosion hazard is moderate to severe. The soil tills easily, but proper use of crop residue and close-growing crops helps to reduce the erosion hazard.

Approximately half of this soil has been cleared and is in pasture or in pine trees. A few small areas are in cultivation. The rest is in forest. This soil is suited to

B23tg—30 to 43 inches, light olive-gray (5Y 6/2) clay; few to common, fine, distinct, light olive-brown and yellowish-brown mottles; moderate, fine and medium, subangular and angular blocky structure; firm, very plastic and very sticky; few fine roots; few, fine, brown and black concretions; clay films or pressure faces on peds; common, medium to coarse slickensides that do not intersect; very strongly acid; gradual, wavy boundary.

B3g—43 to 58 inches, light olive-gray (5Y 6/2) clay; few, fine, faint, gray mottles; weak, fine and medium, subangular and angular blocky structure; firm, very plastic, very sticky; few, fine, black and brown concretions; common to many, medium and coarse slickensides that intersect; very strongly acid; gradual, wavy boundary.

C1—58 to 68 inches, light olive-brown (2.5Y 5/4) clay; common, fine, distinct, light olive-gray mottles; massive; firm, very plastic, very sticky; few, fine, black and brown concretions; medium acid; gradual, wavy boundary.

C2—68 to 85 inches, mottled yellowish-brown (10YR 5/6), light olive-gray (2.5Y 6/2), and olive-yellow (2.5Y 6/6) clay; massive; firm, very plastic, very sticky; common, fine, black and brown concretions; few,

Stough Series

to the Longview soils in drainage but have less clay above

black concretions; about 40 percent chalk fragments; few shell fragments; moderately alkaline; clear, irregular boundary.

C2—34 to 60 inches, gray (5Y 6/1) chalk; common to many, fine and medium, olive-yellow mottles; rock-controlled structure; very firm; can be dug with spade when moist; moderately alkaline.

The Ap horizon ranges from dark grayish brown to brown. The B horizon is light yellowish brown, olive, or pale olive in color and silty clay, clay, or silty clay loam in texture. The average clay content ranges from 40 to 60 percent. The C horizon ranges from firm marly clay to very firm chalk that can be cut with a spade when moist. The solum ranges from 20 to 50 inches in thickness. Reaction ranges from mildly alkaline to moderately alkaline throughout, and the calcium carbonate content ranges from 40 to 60 percent within 40 inches of the surface. The number of soft white limy spots and hardened lime nodules ranges from few to common.

The Sumter soils occur with Houston, Brooksville, Oktib-

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

Some of this soil is used for pasture and hay. The rest is in woodland. Because of the steep slopes and erosion hazard, this soil is better suited to pasture than to other uses. (Capability unit VIe-2; woodland suitability group 4c2c; wildlife suitability group 4)

Sumter and Binnsville soils, 2 to 5 percent slopes, eroded (SvB2).—This mapping unit consists of some areas of Sumter silty clay loam, some of Binnsville silty clay loam, and some of a combination of the two. The soils are dominantly well drained.

The Sumter soils make up about 29 percent of this mapping unit, and the Binnsville soils make up about 19

percent. Minor soils that make up the rest include a soil that has a thin, grayish-brown to dark grayish-brown surface layer and has firm chalk within 16 inches of the surface. Other minor soils are areas of Brooksville and Kipling soils and a soil similar to the Kipling soil but that differs in having marly clay or chalk within 20 inches of the surface. Also, Catalpa and Leeper soils are in some of the narrow alluvial areas near small drainageways and in the heads of short lateral drainageways.

The pattern and extent of the dominant Sumter and Binnsville soils are not uniform in this mapping unit, but the soils can occur in all delineations with one or more of the minor soils. Some delineations consist of only one of the dominant soils.

Runoff is medium, and the erosion hazard is moderate. The degree of erosion is variable, but in most areas the surface layer has been thinned by erosion, and, where plowed, it is a mixture of the surface layer and the subsoil. In a few areas the plow layer is a mixture of the surface layer and firm chalk fragments. Also, in a few areas, shallow gullies and small patches of chalk outcrops are common.

The Sumter soil has a dark grayish-brown silty clay loam surface layer and a pale-olive to olive silty clay subsoil that has brown and yellow mottles. It is underlain by marl or chalk at a depth of about 20 to 30 inches. The Sumter soil is mildly alkaline to moderately alkaline. Permeability is slow, and the available water capacity is medium.

The Binnsville soil has a very dark grayish-brown silty clay loam surface layer overlying light-gray marl or chalk at a depth of about 10 to 15 inches. The Binnsville soil is mildly alkaline to moderately alkaline. Permeability is slow, and the available water capacity is low because of the shallowness of the soil over chalk.

Most of the acreage has been cleared and used for cultivation in the past. Some has been allowed to erode and revert to cedar and Osage-orange trees. Most of the rest is in pasture or hay, and some minor areas are in cultivation. These soils are suited to pasture. They need a permanent plant cover to limit further erosion and decrease the runoff. (Both soils, capability unit VIe-2; Sumter part, woodland suitability group 4c2c; Binnsville [illegible]

brown and black concretions; very strongly acid; clear, smooth boundary.

B21—5 to 12 inches, dark grayish-brown (10YR 4/2) silty clay; few, fine, faint mottles of grayish brown and brown; weak to moderate, fine and medium, subangular blocky structure; firm, plastic, slightly sticky; common fine roots; common, fine, brown and black concretions; very strongly acid; gradual, smooth boundary.

B22g—12 to 18 inches, grayish-brown (2.5Y 5/2) silty clay; many, fine, distinct yellowish-brown (10YR 5/4) mottles; weak to moderate, fine and medium, subangular blocky structure; plastic and sticky; few fine roots; few to common brown and black concretions; very strongly acid; clear, smooth boundary.

B23g—18 to 55 inches, light brownish-gray (2.5Y 6/2) silty clay; common to many, fine and medium, distinct mottles of dark yellowish brown (10YR 4/4) and grayish brown (10YR 5/2); weak, fine and medium, subangular blocky structure; firm, very plastic; very sticky; few fine roots; few to common, fine and medium, brown and black concretions; very strongly acid.

The Ap horizon is dark brown to brown. The B21 and B22 horizons are dark grayish brown to grayish brown or are mottled in shades of brown, yellow, or gray. The lower part of the B horizon is dominantly gray to light brownish gray and has few to many mottles in shades of brown or yellow or in shades of gray, brown, and yellow. The B horizon is silty clay loam, clay loam, silty clay, or clay with a clay content ranging from 40 to 55 percent between depths of 10 and 40 inches. Brown and black concretions range from few to many. Reaction of these soils ranges from strongly acid to very strongly acid except in areas that have received lime.

The Urbo soils are associated with the Mathiston, Mantachie, and Leeper soils. The Urbo soils are similar to the Mathiston and Mantachie soils in drainage but are finer textured in the B horizon. The Urbo soils differ from the Leeper soils in that the Leeper soils are medium acid to moderately alkaline in reaction and have a darker surface layer.

Urbo silty clay loam (Ur).—This is a somewhat poorly drained soil having slopes of 0 to 2 percent.

Included with this soil in mapping were small areas of Mathiston and Mantachie soils, and some low areas of soils that are more poorly drained and have a gray subsoil. Also included were a few areas that have a silt loam surface layer.

This soil is strongly acid to very strongly acid. Permeability is very slow. The available water capacity is high. Runoff is slow, and ponding occurs in some low

It is underlain to a depth of 8 inches by a yellowish-red silty clay. Below this, to a depth of about 42 inches, is a clay mottled with shades of red, gray, and brown. This is underlain by a grayish-brown or brown shaly clay mottled with olive brown.

Representative profile of a Wilcox silty clay loam, in an idle field located about 4 miles south of U.S. Highway No. 82, 0.8 mile east of Maben-Sturgis road and on south bank of blacktop road, NW¼NE¼ sec. 33, T. 19 N., R. 12 E.

Ap—0 to 4 inches, dark yellowish-brown (10YR 4/4) silty clay loam; moderate, fine, granular structure; friable; many fine roots; common fine concretions; very strongly acid; clear, smooth boundary.

B21t—4 to 8 inches, yellowish-red (5YR 4/8) silty clay; few to common, fine and medium, distinct, yellowish-brown (10YR 5/6) and grayish-brown (10YR 5/2)

lain at depths ranging from 33 to 70 inches by acid shaly clay.

Included with this soil in mapping were small areas of Falkner, Longview, and Providence, heavy substratum, soils.

This soil is extremely acid to very strongly acid. Permeability is very slow. The available water capacity is high. The soil shrinks and cracks during dry periods. Runoff is slow, and if this soil is cultivated, seedbed preparation is often delayed because of wetness.

Most of this soil has remained in woodland. Minor areas are used for hay crops, soybeans, or small grain. This soil is well suited to pasture plants and pine trees. (Capability unit IIIw-4; woodland suitability group 3c2; wildlife suitability group 6)

Wilcox silty clay loam, 2 to 5 percent slopes, eroded

(Capability unit IVe-3; woodland suitability group 3c2; wildlife suitability group 6)

Crops and Tame Pasture [2]

This subsection describes general practices of soil

to rice, cranberries, horticultural crops, or other crops requiring special management.

The capability classification reflects the behavior of soils when used for other purposes, but this classification is not a substitute for interpretation designed to show suitability and limitation of groups of soils for range, for forest trees, or for engineering.

to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic

the fragipan and moderately slow in the fragipan and clayey layer. Root pentration is retarded in the fragipan. The available water capacity is medium.

With a high level of management, this soil is suited to cotton, corn, soybeans, grain sorghum, small grain, [illegible] be tilled only within a narrow range of moisture content.

Under a high level of management, these soils are suited to cotton, corn, soybeans, small grain, sericea lespedeza, black medic, wild winter peas, white clover, [illegible]

CAPABILITY UNIT IIw-7

With a high level of management, this soil is suited to corn, soybeans, grain sorghum, common and Coastal bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, annual lespedeza, and white clover.

Applications of complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration im-

and crack during dry periods. They are easily worked except in areas where the subsoil is exposed. They crust and pack if left bare. The Wilcox soil tends to clod if tilled when wet.

If a high level of management is used, the soils of this unit are suited to corn, cotton, soybeans, small grain, common and Coastal bermudagrass, dallisgrass, bahiagrass, tall fescue, sudangrass, annual lespedeza, sericea lespedeza, white clover, and pine trees.

easy to work but can be tilled only within a narrow range of moisture content.

If a high level of management is used, these soils are suited to cotton, corn, soybeans, grain sorghum, small grain, common and Coastal bermudagrass, dallisgrass, tall fescue, johnsongrass, bahiagrass, wild winter peas, vetch, annual lespedeza, and sericea lespedeza.

Erosion is a slight to moderate hazard, but it can be controlled by using such water-control measures as contour tillage, grassed waterways, and terraces or strip-cropping. If these soils are protected by such measures, a suitable cropping system is one that leaves a large amount of crop residue.

Applications of a complete fertilizer are needed for production of most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Lime is needed for most plants. Crop residue left on the surface helps to control erosion, to increase infiltration, and to maintain organic-matter content. Planting is sometimes delayed in spring because these soils dry out slowly.

CAPABILITY UNIT IIIe-4

The only soil in this capability unit is Providence silt loam, heavy substratum, 5 to 8 percent slopes, eroded. This upland soil is moderately well drained and very strongly acid to strongly acid. It has a silt loam surface layer. The subsoil is silty clay loam that has a fragipan at a depth of 16 to 27 inches. The fragipan is underlain by a clayey layer at a depth of 30 to 48 inches.

Permeability is moderate above the fragipan and moderately slow in the fragipan and clayey layer. The available water capacity is medium. Root penetration is retarded in the fragipan. This soil can be worked

If a high level of management is used, this soil is suited to common bermudagrass, tall fescue, bahiagrass, dallisgrass, white clover, annual lespedeza, oats, and soybeans.

Applications of a complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave a large amount of residue, and then by effectively using the crop residue.

This soil has fairly good tilth but crusts and packs if left bare. Proper arrangement of rows and surface field ditches helps to remove excess surface water.

CAPABILITY UNIT IIIw-2

This capability unit consists of somewhat poorly drained, strongly acid to very strongly acid upland soils. These soils are in the Falkner and Longview series. Slopes range from 0 to 5 percent. They have a silt surface layer, and the subsoil is silt loam or silty clay loam that has a fragipan or clay layer at a depth of 15 to 30 inches.

Erosion is slight to none. Permeability is moderate in the upper subsoil above the fragipan and clay layer, but slow within these layers. These soils have a perched water table because of the fragipan and clay layers. The available water capacity is medium to high. These soils are easily worked, but they crust and pack when left idle, and a plowpan forms readily if depth of plowing is not varied.

Under a high level of management, these soils are suited to cotton, corn, soybeans, grain sorghum, small grains, Coastal and common bermudagrass, tall fescue, dallisgrass, bahiagrass, wild winter peas, vetch, annual

able water capacity is medium. This soil is easily worked but tends to crust and pack when left bare.

With a high level of management, this soil is suited to cotton, corn, soybeans, small grain, common and Coastal bermudagrass, tall fescue, dallisgrass, bahiagrass, sudangrass, vetch, annual lespedeza, and white clover.

Applications of a complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration improved by growing crops that leave large amounts of residue, and by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

With adequate drainage and proper use of crop residue, suggested cropping systems are (1) continuous row crops and good use of crop residue, or (2) close-growing crops for 3 years and row crops for 2 years. Another system is that of keeping perennial vegetation on the soil most of the time.

Because of the fragipan, this soil is waterlogged in winter and early in spring. Seedbed preparation and planting are often delayed in spring by wetness. Excess surface water generally can be removed by using surface field ditches and proper arrangement of crop rows.

CAPABILITY UNIT IIIw-4

The only soil in this capability unit is Wilcox silt loam, 0 to 2 percent slopes. It is a somewhat poorly drained, extremely acid to strongly acid soil on uplands. The surface layer is silt loam, and the subsoil is silty clay or clay.

Erosion is slight to none, and permeability is very slow. The available water capacity is high. The soil shrinks and cracks during dry periods. The soil works fairly easily, but it can be cultivated only within a narrow range of moisture content. Also, it crusts and packs if left bare.

Under a good level of management, pasture can be produced on this soil. It is poorly suited to most of

Erosion is moderate. Permeability is moderate in the subsoil and moderately slow in the fragipan. Root penetration is retarded in the fragipan. The available water capacity is medium. This soil can be worked easily, but it crusts and packs if left bare. A plowpan tends to form if depth of plowing is not varied.

Under a high level of management, this soil is suited to grain sorghum, small grain, Coastal and common bermudagrass, tall fescue, bahiagrass, sudangrass, wild winter peas, vetch, annual lespedeza, sericea lespedeza, and white clover.

Because of slope, rapid runoff, and severe erosion hazard, this soil is particularly suited to permanent vegetation. If erosion control is adequate, a suggested cropping system is 6 years of sod crops and 2 years row crops. Tillage on the contour, terraces, and grassed waterways are helpful in controlling erosion. Field roads should be located on the dividing ridges or parallel to the terraces. Without such practices for control of erosion, this soil should be kept in perennial vegetation.

Applications of a complete fertilizer and lime are needed for all crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Crop residue shredded and left on the surface is helpful in controlling erosion, improving infiltration, and maintaining organic-matter content.

CAPABILITY UNIT IVe-2

This capability unit consists of moderately well drained and somewhat poorly drained, strongly acid to very strongly acid soils. Slopes range from 5 to 8 percent. These soils are in the Kipling and Oktibbeha series. They have a silty clay loam surface layer, and the subsoil is silty clay or clay. Permeability is slow to very slow. The available water capacity is high. Most of these soils shrink and crack during dry periods. They are fairly easy to work, but can be tilled only within a narrow range of moisture content.

Under a high level of management, these soils are suited to soybeans, grain sorghum, small grain, tall

Wilcox series. They have a fine sandy loam, clay loam, or friable silty clay loam surface layer, and the subsoil is clay loam to clay.

Erosion is slight to moderate. Permeability is moderately slow to very slow. The available water capacity is medium to high. Wilcox soils shrink and crack during dry periods, and they tend to clod when wet. Maben soils work easily, except in areas where the subsoil is exposed. Where subsoil is at the surface, they crust and pack when left bare.

Under a high level of management, these soils are suited to small grain, common and Coastal bermudagrass, bahiagrass, sudangrass, tall fescue, annual and sericea lespedeza, and white clover.

Applications of a complete fertilizer and lime are needed for most crops and permanent pasture, and additional nitrogen is needed for all nonlegumes.

Because of slope, runoff is moderate to rapid, and the erosion hazard is moderate to severe. Terraces, stripcropping, grassed waterways, and contour tillage reduce runoff and help to control erosion. Even if protected by such measures, this soil should be kept in perennial vegetation most of the time. A suggested cropping system is sod for 6 years and row crops for 2 years. Perennial vegetation should be continuously grown if the soils are not protected by terracing, stripcropping, or similar practices for control of erosion.

CAPABILITY UNIT IVe-5

This capability unit consists dominantly of well drained, mildly alkaline to moderately alkaline soils of the prairie uplands. Slopes range from 2 to 8 percent. These soils are in the Binnsville and Sumter series. They have a friable silty clay loam surface layer, which overlies silty clay or marly clay. Chalk is at a depth of about 10 to 30 inches.

Erosion is moderate. Permeability is slow. These soils have a low to medium available water capacity. They work fairly easily, but only within a narrow range of moisture content.

Under a good level of management, these soils are suited to small grains, common bermudagrass, King Ranch bluestem, tall fescue, johnsongrass, dallisgrass, wild winter peas, vetch, white clover, sweetclover, and black medic.

Applications of fertilizer are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content can be maintained and infiltration can be improved by growing crops that leave large amounts of residue, and by effectively using the residue. A cover is needed on the surface of the soils as much of the time as possible for the purpose of reducing the erosion hazard. A suggested cropping system is 4 years sod crops and 2 years of small grain. Another system is continuous sod crops.

Erosion is slight to none. Permeability is very slow. The available water capacity is high. This soil shrinks and cracks during dry periods. It is difficult to work and can be tilled only within a narrow range of moisture content.

This soil is not suited to many crops, but with good management soybeans, small grains, Coastal and common bermudagrass, tall fescue, bahiagrass, dallisgrass, johnsongrass, wild winter peas, lespedeza, and white clover can be grown.

Applications of a complete fertilizer and lime are needed for row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. Organic-matter content should be maintained and infiltration improved by growing crops that leave a large amount of residue, and by effectively using the crop residue. The crop residue should be shredded and left on the surface as a mulch.

With adequate drainage and good management of crop residue, this soil can be used continuously for clean-tilled crops. Without these practices, continuous perennial vegetation is suggested for this soil.

Because this soil is nearly level and dries slowly, seedbed preparation and planting are often delayed in spring. Surface field ditches, drainage mains and laterals, and proper row arrangement are helpful in removing excess surface water.

CAPABILITY UNIT VIe-1

In this capability unit is Oktibbeha soils, 8 to 17 percent slopes, severely eroded. These are moderately well drained, strongly acid to very strongly acid soils on uplands. Because of severe erosion, their clay or silty clay subsoil is at or near the surface.

Permeability is slow to very slow. The available water capacity is high to medium.

Because of slope, rapid runoff, and severe erosion hazard, these soils are used for bermudagrass, bahiagrass, annual lespedeza, sericea lespedeza, and white clover.

They should be kept in permanent vegetation to control further erosion, increase infiltration, and decrease runoff.

Applications of a complete fertilizer and lime are needed for most row crops and permanent pasture, and additional nitrogen is needed for all nonlegumes. The pasture should not be overgrazed.

CAPABILITY UNIT VIe-2

This capability unit consists dominantly of well-drained, mildly alkaline to moderately alkaline soils of the uplands. These soils overlie chalk at depths ranging

Applications of fertilizer are needed for pasture plants, and additional nitrogen is needed for all nonlegumes. The pastures should not be overgrazed. Diversion ditches may be needed in some places to protect these soils from further erosion.

CAPABILITY UNIT VIe-3

The only soil in this capability unit is Wilcox silty clay loam, 8 to 12 percent slopes, eroded. It is a somewhat poorly drained, extremely acid to strongly acid soil on uplands. It has a silty clay loam surface layer, and the subsoil is a silty clay or clay.

Erosion is moderate, and permeability is very slow. The available water capacity is high. This soil shrinks and cracks during dry periods.

Because of slope and erosion hazard, this soil is suitable mainly for pasture. Coastal and common bermudagrass, bahiagrass, tall fescue, sudangrass, annual lespedeza, sericea lespedeza, and white clover are appropriate pasture plants.

This soil should be kept in permanent vegetation so that erosion is controlled. Applications of fertilizer and lime are needed for pasture plants, and additional nitrogen is needed for all nonlegumes. The pastures should not be overgrazed.

CAPABILITY UNIT VIIe-1

This capability unit consists of Gullied land-Sumter complex, 5 to 20 percent slopes. Most of the areas are so severely gullied that soil profiles have been destroyed and only isolated spots and fingerlike extensions of the original soils remain between the gullies. The rest of the identifiable profiles are mainly those of Sumter soils. The underlying material is chiefly mildly to moderately alkaline clay, or firm chalk.

Permeability is slow. The available water capacity is medium to low.

Because of the rapid runoff and very severe erosion hazard, this unit should be kept in permanent vegetation. Perennial pasture plants or cedar trees are suitable for areas where the gullied land is alkaline clay, and pasture or pine trees where the clay is acid.

CAPABILITY UNIT VIIe-2

This capability unit consists of Kipling and Sumter soils, 17 to 40 percent slopes, severely eroded. These soils are intermingled, but not in a regular pattern. They are very strongly acid to moderately alkaline soils on uplands. They have a silty clay loam surface layer, and their subsoil is silty clay or clay.

The hazard of erosion is severe. Permeability is slow

and Ruston series. They have a fine sandy loam surface layer, and their subsoil ranges from sandy clay loam to clay.

Erosion is slight to moderate. Permeability is moderate to moderately slow. The available water capacity is medium to high.

Because of slope, rapid runoff, and the erosion hazard, this soil is better suited to permanent vegetation such as trees.

CAPABILITY UNIT VIIe-4

The only soil in this capability unit is Wilcox silty clay loam, 12 to 35 percent slopes, eroded. It is a somewhat poorly drained, extremely acid to very strongly acid soil on uplands. It has a surface layer of silty clay loam and a subsoil of silty clay or clay.

Erosion is moderate. Permeability is very slow. The available water capacity is high. This soil shrinks and cracks during dry periods.

This soil should be kept in trees or other permanent vegetation that can help in controlling erosion and reducing runoff.

Estimated yields

Estimated average yields per acre of the principal crops on most of the soils in Oktibbeha County under a high level of management are shown in table 2.

The estimates are based on yields obtained in long-term experiments; on observations made during the survey; and on information from agricultural workers who are familiar with the soils in the county. Data for yields obtained on experimental plots were adjusted to reflect the combined effect of slope, weather, and levels of management. If such data were not available, estimates were made by using available data for similar soils.

The following management practices are needed to obtain the yields listed in table 2: (1) application of lime and fertilizer in amounts indicated by soil tests and field trials (lime is not needed in many of the soils in the eastern part of the county); (2) the use of crop varieties that are suited to the area and offer high yields; (3) adequate preparation of the seedbed; (4) planting or seeding the crop by suitable methods at the proper time and rate; (5) inoculation of legumes; (6) practicing shallow cultivation of row crops; (7) controlling weeds, insects, and diseases; (8) the use of cropping systems to help protect the soils from erosion (such as those suggested in the subsection "capability grouping"); (9) where needed, the establishment of grassed waterways, tillage on the contour, construction of terraces, and drainage of the soils; and (10) protection of the soils from overgrazing.

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

[Dashes indicate the crop is not commonly grown on the soil, the soil is not suitable, or yield data are not available]

Soil	Corn	Oats	Cotton lint	Soybeans	Coastal bermudagrass	Bahiagrass and legumes	Coastal bermudagrass and legumes	Common bermudagrass and legumes	Tall fescue and legumes	Dallisgrass and legumes
	Bu.	*Bu.*	*Lb.*	*Bu.*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Adaton silt loam	----	50	----	22	----	165	----	135	255	150
Boswell fine sandy loam, 2 to 5 percent slopes	40	45	450	22	4.0	180	264	160	141	165
Brooksville silty clay, 0 to 2 percent slopes	60	80	625	25	4.0	165	282	165	210	165
Brooksville silty clay, 2 to 5 percent slopes	50	70	550	20	4.0	165	282	165	210	165
Catalpa silty clay loam	85	80	750	30	5.0	----	330	240	210	210
Falkner silt loam, 0 to 2 percent slopes	55	60	575	30	----	180	180	180	165	180
Falkner silt loam, 2 to 5 percent slopes	40	45	550	20	----	156	180	156	150	150
Freestone fine sandy loam, 0 to 2 percent slopes	45	50	450	22	3.5	195	225	150	150	180
Freestone fine sandy loam, 2 to 5 percent slopes	40	45	400	20	1.5	180	225	150	150	165

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

Soil	Corn	Oats	Cotton lint	Soybeans	Coastal bermudagrass	Bahiagrass and legumes	Coastal bermudagrass and legumes	Common bermudagrass and legumes	Tall fescue and legumes	Dallisgrass and legumes
	Bu.	*Bu.*	*Lb.*	*Bu.*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Maben fine sandy loam, 8 to 12 percent slopes, eroded	------	35	------	------	2.5	150	180	147	75	--------
Maben soils, 8 to 12 percent slopes	------	35	------	------	2.5	150	180	147	75	--------
Maben and Ruston soils, 12 to 30 percent slopes	------	------	------	------	------	------	------	------	------	--------
Mantachie loam	75	60	600	32	5.0	240	315	210	225	270
Marietta fine sandy loam	80	70	750	35	4.0	------	330	180	210	210
Mathiston silt loam	75	60	600	32	5.0	240	315	210	225	270
Myatt loam	------	------	------	------	------	------	------	120	195	--------
Ochlockonee loam	80	70	700	35	5.5	300	360	250	240	300
Oktibbeha fine sandy loam, thick solum variant, 5 to 8 percent slopes, eroded	------	50	------	28	------	180	282	129	150	165
Oktibbeha silty clay loam, 2 to 5 percent slopes, eroded	50	55	500	28	4.0	195	282	135	165	180
Oktibbeha silty clay loam, 5 to 8 percent slopes, eroded	------	50	------	25	------	180	282	120	150	165
Oktibbeha soils, 8 to 17 percent slopes, severely eroded	------	------	------	------	------	75	------	90	------	--------
Prentiss silt loam, 0 to 2 percent slopes	55	60	600	25	4.0	216	240	195	180	210
Prentiss silt loam, 2 to 5 percent slopes	50	58	520	22	3.8	210	240	180	180	210
Providence silt loam, heavy substratum, 2 to 5 percent slopes, eroded	55	60	600	22	3.5	225	255	170	180	180
Providence silt loam, heavy substratum, 5 to 8 percent slopes, eroded	50	55	500	20	3.0	195	225	150	165	150
Providence silt loam, heavy substratum, 5 to 8 percent slopes, severely eroded	40	40	425	------	2.5	180	195	135	90	--------
Ruston fine sandy loam, 2 to 5 percent slopes	65	60	575	30	5.0	250	315	195	170	--------
Ruston and Maben soils, 12 to 30 percent slopes	------	------	------	------	------	------	------	------	------	--------
Savannah fine sandy loam, 2 to 5 percent slopes, eroded	55	60	600	22	3.5	225	255	171	240	240
Savannah fine sandy loam, 5 to 8 percent slopes, eroded	50	55	500	20	3.0	255	225	150	165	150
Savannah fine sandy loam, 8 to 12 percent slopes, eroded	------	40	------	------	2.5	165	195	135	90	--------
Sessum silty clay loam	------	45	------	25	4.0	210	282	135	160	180
Stough fine sandy loam	45	55	430	20	3.5	210	240	135	190	165
Sumter silty clay loam, 5 to 8 percent slopes, eroded	------	------	------	------	------	------	------	120	180	165
Sumter silty clay loam, 8 to 12 percent slopes, eroded	------	------	------	------	------	------	------	70	120	60
Sumter and Binnsville soils, 2 to 5 percent slopes, eroded	------	30	------	------	------	------	------	80	135	75
Sumter and Binnsville soils, 5 to 8 percent slopes, eroded	------	------	------	------	------	------	------	75	120	70
Urbo silty clay loam	80	------	------	30	4.0	210	290	150	240	210
Wilcox silt loam, 0 to 2 percent slopes	------	35	------	20	------	168	216	135	165	135
Wilcox silty clay loam, 2 to 5 percent slopes, eroded	35	35	400	20	------	165	216	140	160	--------
Wilcox silty clay loam, 5 to 8 percent slopes, eroded	------	30	------	------	------	165	216	130	156	--------
Wilcox silty clay loam, 8 to 12 percent slopes, eroded	------	------	------	------	------	156	216	120	156	--------
Wilcox silty clay loam, 12 to 35 percent slopes, eroded	------	------	------	------	------	------	------	------	------	--------

[1] Cow-acre-days is a term used to express the carrying capacity of a pasture. It is the number of animal units carried per acre multiplied by the number of days the pasture is grazed during the year without injury to the sod. For example, an acre of pasture that provides 30 days of grazing for two cows has a carrying capacity of 60 cow-acre-days.

TABLE 3.—*Soils rated for woodland use*

[Gullied land-Sumter complex, 5 to 20 percent slopes, not rated because properties are variable]

Woodland suitability group	Soil	Potential productivity			Hazards and limitations			Species suitable for planting
		Tree species [1]	Average site index and standard deviation [2]	Range of site index	Erosion hazard	Equipment restriction	Seedling mortality	
Group 1w5: Moderately well drained and somewhat poorly drained soils on the flood plains. Moderate to slow permeability; high available water capacity.	Catalpa: Cp.	Green ash	101	79–106	Slight	Moderate	Moderate	Cottonwood, sweetgum, and sycamore.
		Cottonwood	[3] 108	88–118				
		American elm						
		Slippery elm						
		Hackberry						
		Sweetgum	[3] 100	88–107				
		Sycamore						
	Marietta: Mt.	Green ash		80–100	Slight	Moderate	Moderate	Cottonwood, sweetgum, sycamore, and yellow-poplar.
		Cottonwood		90–110				
		American elm						
		Slippery elm						
		Hackberry						
		Red oak						
		White oak						
		Sweetgum		90–105				
		Sycamore						
		Yellow-poplar						
Group 1w6: Somewhat poorly drained soils on flood plains. Slow permeability; high available water capacity.	Leeper: Le.	Green ash	94	72–99	Slight	Severe	Severe	Green ash, cottonwood, sweetgum, and sycamore.
		Cottonwood	110	85–115				
		American elm						
		Slippery elm						
		Hackberry						
		Sweetgum	95	90–105				
		Sycamore						
		Durand oak						
Group 1w9: Somewhat poorly drained soils on flood plains. Moderate permeability; available water capacity medium to very high.	Mantachie: Ms. Mathiston: Mu.	Green ash	88 ± 10	66–93	Slight	Severe	Moderate to severe.	Green ash, cottonwood, Cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, loblolly pine, sweetgum, sycamore, and yellow-poplar.
		Cottonwood	92	72–102				
		Hackberry						
		Cherrybark oak	101 ± 4	89–106				
		Nuttall oak		99–111				
		Shumard oak						
		Southern red oak						
		Swamp chestnut oak.						
		Water oak	94 ± 5	82–101				
		White oak						
		Willow oak	96 ± 6	86–100				
		Loblolly pine	98 ± 7	90–106				
		Sweetgum	100 ± 6	88–107				
		Sycamore						
		Black tupelo						
		Black walnut						
		Yellow-poplar						

Group 2o7: Well drained and moderately well drained soils. Permeability is moderate to moderately slow. Available water capacity is medium.	Ochlockonee: Oc.	River birch			Slight	Slight	Slight	Cherrybark oak, Shumard oak, swamp chestnut oak, loblolly pine, sweetgum, sycamore, and yellow-poplar.
		Black cherry						
		Cottonwood						
		American elm						
		Slippery elm						
		Hackberry						
		Hickories, except water.						
		Southern magnolia						
		Red maple						
		Cherrybark oak	87	75–94				
		Nuttall oak	[3] 85	73–92				
		Southern red oak						
		Water oak	82	70–89				
		White oak						
		Willow oak	[3] 85	75–89				
		Loblolly pine	95 ± 6	89–105				
		Sweetgum	90 ± 5	78–99				
		Sycamore						
		Black tupelo						
		Black walnut						
	Prentiss: PnA, PnB.	Hickories, except water.			Slight	Slight	Slight	Loblolly pine, cherrybark oak, and Shumard oak.
		Cherrybark oak		80–95				
		Swamp chestnut oak.						
		White oak						
		Loblolly pine	88	83–96				
		Shortleaf pine	79	75–85				
		Sweetgum		80–95				
		Black tupelo						
Group 2w6: Somewhat poorly drained soils on flood plains. Very slow permeability; high available water capacity.	Urbo: Ur.	Green ash	94 ± 2	72–106	Slight	Severe	Moderate to severe.	Shumard oak, swamp chestnut, oak, sycamore, and yellow-poplar.
		Cottonwood	100	80–110				
		American elm						
		Slippery elm						
		Hackberry						
		Hickories, except water.						
		Southern magnolia						
		Red maple						
		Cherrybark oak	99 ± 2	87–108				
		Laurel oak						
		Nuttall oak	108 ± 6	96–110				
		Water oak	96 ± 11	84–103				
		White oak						
		Willow oak	100 ± 10	90–104				
		Persimmon						
		Sweetgum	95 ± 8	88–105				
		Black tupelo						

See footnotes at end of table.

| | | |

k oak	90	80–100	Slight	Moderate	Moderate	Cherrybark oak Shumard oak, loblolly pine, and sweetgum.
k						
oak						
ne	90	80–100				
	90	80–100				
ne	84 ± 5	76–90	Slight	Slight	Slight	Loblolly pine.
pine	75 ± 4	66–80				
k oak	[3] 95	85–105	Slight	Slight	Slight	Cherrybark oak,[4] Shumard oak,[4] and swamp chestnut oak.[4]
oak						
estnut						
		70–85				
ine	84 ± 10	73–95				
pine	64 ± 7	58–73				
	90	80–100				
red oak	75	70–80	Slight	Slight	Slight	Loblolly pine and shortleaf pine.
ine	81 ± 5	75–86				
pine	76 ± 4	70–81				
	[3] 80	75–85				
			Slight	Severe	Severe	Shumard oak, swamp chestnut oak, loblolly pine, sweetgum, and yellow-poplar.
, except						
rk oak	90	75–97				
hestnut						
k	94	79–101				
k						
ine	84	75–95				
	98	78–105				
pelo						
oplar						
pine	82 ± 4	74–87	Slight	Moderate	Moderate	Loblolly pine and shortleaf pine.
f pine	72 ± 4	67–77				
pine	83	76–88	Slight to moderate.	Moderate	Slight	Loblolly pine and shortleaf pine.
f pine	73	67–78				
pine	81 ± 3	76–85	Slight	Moderate	Moderate	Loblolly pine.
f pine	68 ± 5	63–75				
redcedar	45	40–50				

TABLE 3.—*Soils rated for woodland use*—Continued

Soil	Potential productivity			Hazards and limitations			Species suitable for planting
	Tree species [1]	Average site index and standard deviation [2]	Range of site index	Erosion hazard	Equipment restriction	Seedling mortality	
Oktibbeha: OlB2, OlC2, OhC2, OtE3.	Southern red oak	[3] 70	65–75	Slight	Moderate	Moderate	Loblolly pine and eastern redcedar.
	Loblolly pine	76± 5	69–82				
	Shortleaf pine	66± 4	60–72				
	Eastern redcedar	45	40–50				
Sessum: Se.	Southern red oak	----------	--------	Slight	Moderate	Moderate	Loblolly pine and eastern redcedar.
	White oak	----------	--------				
	Loblolly pine	83± 3	75–90				
	Sweetgum	80	70–90				
	Eastern redcedar	----------	--------				
Brooksville: BrA, BrB.	Eastern redcedar	40	--------	Slight to moderate.	Moderate	Moderate	Eastern redcedar.
Houston: Ho.	Eastern redcedar	40	35–45	Slight	Moderate	Moderate	Eastern redcedar.
Sumter: SuC2, SuD2, Sumter part of KsF3, SvB2, and SvC2.	Eastern redcedar	37± 5	32–45	Moderate	Moderate	Moderate	Eastern redcedar.
Binnsville part of SvB2 and SvC2.	Eastern redcedar	40	35–45	Slight to moderate.	Moderate	Severe	Eastern redcedar.

developed by WALTER M. BROADFOOT, Southern Hardwoods Laboratory, Southern Forest Experiment Station, U.S. Forest
es in italics is the indicator species.
in feet of dominant and codominant trees at 50 years of age for all species except cottonwood, which is at 30 years.
similar soil or another species on the same soil.
oils are severely eroded.

the same suitability for wood crops, that require about the same management, and that have about the same potential productivity.

Potential productivity is expressed as site index. Site index is the average height in feet of dominant and codominant trees at 50 years of age for all species except cottonwood, which is at 30 years. Site indexes are recorded for the most important tree species that commonly occur on the soils of each woodland suitability group. These site indexes are based on soil-woodland correlation studies and available research data (*4*).

As shown in table 3, each woodland suitability group has, in varying degree, certain problems and limitations

3.) To a lesser degree, clayey soils also impose limitations, but these have moderate ratings.

Seedling mortality, or regeneration potential, refers to the failure of tree seedlings to survive and grow, due primarily to soil or topographic conditions. It is assumed that plant competition and rainfall are not limiting factors. The term "seedlings" applies to (1) naturally occurring seedlings, (2) direct-seeded seedlings, and (3) planted seedlings. In each of these three methods of regeneration it is assumed that the seedlings initially established are of species well-suited to the soil and total site. In the case of *naturally occurring* seedlings, it is assumed there is (1) adequate seed source, (2) acceptable

Subclass w (*excessive wetness*). Soils in which excessive water, either seasonally or year long, causes significant limitations for woodland use or management. These soils have restricted drainage, high water tables, or overflow hazards that adversely affect either development or management of the stand.

Subclass d (*restricted rooting depth*). Soils that have restrictions or limitations for woodland use or management because of restricted root depth. Examples are soils shallow to hard rock, hardpan, or other layers in the soil that restrict roots.

Subclass c (*clayey soils*). Soils having restrictions

a water supply. Furthermore, these requirements must be present in a particular pattern or relationship that suits each animal. Take away one of these requirements, or alter the arrangement of them, and a limiting factor is created that can reduce or even eliminate wild animals from the area. Each kind of animal has somewhat different needs, but usually good conditions for several kinds can be met on the same site. Collectively, these animal requirements and their arrangement on the land is called habitat. Animal habitat is dependent upon soil conditions, on land use, and on moisture and other climatic features.

If we are to relate animals to any particular soil,

Openland and edge wildlife are bobwhite quail, dove, cottontail rabbit, a wide variety of song birds that are associated with open and semiopen farmland, and fox, skunk, and opossum.

Woodland wildlife are deer, squirrel, turkey, swamp rabbits, forest-dwelling song birds, bobcat, and raccoon.

Wetland wildlife, as used here, refers to ducks, but geese, snipe, rail, herons, shore birds, and furbearers are usually associated.

Only food plants are listed in table 4. Cover plants such as briers, weeds, brush, and vines are of equal importance for bobwhite quail and rabbits. Cover plants are not listed because of the wide variety of suitable plants adapted to all six groups. Practically anywhere in Oktibbeha County, suitable cover plants will grow naturally if encouraged. This can be the most important part of any wildlife program. Under cottontail rabbit and squirrel, no "planted food" column is indicated. Food is not ordinarily planted for squirrels although corn, peanuts, or nut trees could be. The cottontail rabbit eats such a wide variety of vegetation that naming the varieties would not be practical. Any adapted grain, grass, or clover can be used. Cover plants are the primary requirement for rabbits. If they are available, suitable food plants usually are present.

WILDLIFE SUITABILITY GROUP 1

This wildlife suitability group is coextensive with the Leeper-Marietta-Catalpa soil association. The soils are nearly level and are along major streams and the lower reaches of the stream tributaries. They are somewhat poorly drained to moderately well drained and are subject to occasional flooding, which is usually of short duration. These soils are medium acid to moderately alkaline. They have a deep root zone and a high available water capacity, which supports plants through extreme drought conditions.

Most of the areas are cleared and in crops. This is a hardwood timber site and, where not cleared, it produces a wide variety of hardwood trees and shrubs. Because available water capacity and natural fertility are favorable, johnsongrass and undesirable weeds are in serious competition with some of the better wildlife foods for quail and dove. Where plantings are made for wildlife, the plantings require cultivation to retard competition. The soils hold water and are suitable for commercial fish production if water for filling ponds is available. They are also suitable for shallow water impoundments um, but these soils are more susceptible to drought than those of wildlife suitability group 1.

Grasses and grains, as well as most summer annuals, do well on these soils. Lespedeza is fairly well suited to these soils. Lime is necessary for growing clover on these soils. Timber is on most areas, and pine and hardwoods are suitable. The soils hold water and are suitable for fish production in either dug-out or levee type ponds if water for filling the ponds is available. Selected sites are suitable for waterfowl developments.

These soils provide suitable environment for all species of wildlife that inhabit this county.

WILDLIFE SUITABILITY GROUP 3

The wildlife suitability group is coextensive with the Kipling-Sumter-Gullied land soil association. The association consists of unstable clays and of Gullied land with numerous chalk outcrops. The cover is mostly low grass and cedar, Osage-orange, and scrubby hardwoods. Because available water capacity is limited and the root zone is shallow, it is difficult to establish planted wildlife foods on this wildlife group. Valuable cover is produced naturally in small clumps, and there are a few native food plants, but generally this is an area of low productivity for wildlife. By picking small sites within this area, spring and fall crops such as vetch, grasses, and grains could be grown.

These soils are not suitable for intensive wildlife development but are capable of producing plant associations that can support low populations of openland and woodland wildlife. Most wildlife using this area have part of their home range in other adjacent wildlife suitability groups.

WILDLIFE SUITABILITY GROUP 4

This wildlife suitability group is coextensive with the Kipling-Savannah-Oktibbeha soil association and the Kipling-Brooksville-Sumter soil association. In these associations are somewhat poorly drained to well-drained, acid and alkaline, clayey and loamy soils on uplands. Slopes range from nearly level to steep. The nearly level sites are used mostly for pasture and crops. Sites suitable for both hardwoods and pines are present. These are deep soils with medium to high available water capacity. They are well suited to grasses.

A wide variety of native wildlife food and cover plants are suited to these soils. Lespedeza can be grown on most of these soils. Clover on the acid soils require lime for good production. Planting sites for wildlife food must be selected on 0 to 5 percent slopes. Steeper sites should not be plowed, because of an erosion hazard. Because of

habitat because of the present land use, but management for quail and rabbits is feasible. Several native and planted quail foods are adapted, provided sufficient lime is added. Ponds built in this area also require lime for better fish production.

Soils in this group are particularly suited to woodland wildlife, but can produce plant associations suited to openland wildlife if special planning and maintenance is practiced.

WILDLIFE SUITABILITY GROUP 6

This wildlife suitability group is coextensive with the Maben-Ruston-Savannah and the Wilcox soil associations. In these associations are clayey and loamy, acid soils of

TABLE 4.—*Potential food plants*

Wildlife suitability groups	Openland and edge wildlife (farm game)				
	Bobwhite quail		Cottontail rabbit	Dove	
	Native food plants	Planted foods	Food plants	Native food plants	Planted foods
Group 1: Nearly level, medium acid to moderately alkaline soils subject to flooding; mostly cropland. Association 1.	Partridgepea, wild bean, beggarticks, and oak trees.	Cowpeas, millet, common and bicolor lespedeza, and soybeans.	Grains, clover, and native grasses.	Paspalum, amaranth, woolly croton, and panicgrass.	Browntop millet, corn, sorghum, sunflower, and proso.
Group 2: Nearly level, acid soils subject to flooding; mostly woodland. Associations 2 and 3.	Partridgepea, lespedeza, beggarticks, and oak trees.	Millet, bicolor lespedeza, and soybeans.	Grains, clover, vetch, and native grasses.	Paspalum, woolly croton, and amaranth.	Sunflower, soybeans, corn, proso, and browntop millet.
Group 3: Unstable clays and Gullied land and chalk outcrop; sloping upland soils; mostly in cedar and Osage-orange. Association 5.	Single-seed croton and Osage-orange.	Lespedza, and common vetch.	Native grasses and vetch.	Single-seed croton.	Not suitable
Group 4: Acid and alkaline, clayey and loamy, nearly level to steep soils; mostly pasture and cropland. Associations 4 and 6.	Common lespedeza, woolly croton, partridgepea, oak trees, and Osage-orange.	Lespedeza, cowpeas, soybeans, millet, and vetch.	Grains, clover, vetch, and native grasses.	Paspalum, woolly croton, and panicgrass.	Browntop millet, corn, and sorghum.
Group 5: Acid, loamy, nearly level to gently sloping soils; mostly woodland. Associations 9 and 10.	Partridgepea, beggarticks, broomsedge, and oak trees.	Lespedeza, cowpeas, millet, soybeans, and wheat.	Grains, clover, and native grasses.	Paspalum, woolly croton, and panicgrass.	Browntop millet, corn, and sorghum.
Group 6: Acid, loamy and clayey, hilly soils; mostly woodland. Associations 7 and 8.	Beggarticks, partridgepea, and lespedeza.	Lespedeza, cowpeas, and soybeans.	Grains, clover, and native grasses.	Woolly croton and panicgrass.	Browntop millet, corn, and sorghum.

the uplands. The soils are now wooded with pines and hardwoods. Because they are highly erosive they should be kept under a permanent cover of vegetation. Sites for wildlife plantings and clearings should be picked on ridgetops and lower slopes to avoid excessive steepness.

The lespedezas, both native and planted, are suited to these soils. Other wildlife foods to be planted here require lime to correct the acid condition in some of the eroded spots. Both the native and the planted wildlife food plants need fertilizer. Pond sites are numerous, and there is usually no water-holding problems. Lime is necessary for good fish production in ponds. This area is well suited to forest game. Openland game habitat can be developed on these soils with special planning.

by wildlife suitability groups

Woodland wildlife (forest game)					Wetland wildlife (waterfowl)	
Squirrel	Deer		Turkey			
Native food plants	Native food plants	Planted foods	Native food plants	Planted foods	Native food plants	Planted foods
Maple, mulberry, oak, beech, and hickory trees.	Greenbrier, honeysuckle, and all hardwoods.	Grains, clover, ryegrass, and tall fescue.	Dogwood, paspalum, and grapes.	Grains, clover, ryegrass, and bahiagrass.	Smartweed, sedges, and oak trees.	Chufa, tall fescue, corn, Japanese millet, browntop millet, and rice.
Oak, hickory, and maple trees.	Greenbrier, honeysuckle, and all hardwoods.	Grains, white clover, ryegrass, and tall fescue.	Oak acorns, grapes, and blackgum.	Grains, white clover, ryegrass, and bahiagrass.	Oak trees, smartweed, and sedges.	Chufa, tall fescue, Japanese millet, browntop millet, corn, and rice.
Not suitable	Not suitable	Not suitable	Not suitable	Not suitable	Not suitable	Not suitable.
Oak, hickory, dogwood, and maple trees.	Greenbrier, honeysuckle, and all hardwoods.	Grains, clover, and ryegrass.	Oak acorns, grapes, paspalum, and blackberry.	Grains, clover, ryegrass, and bahiagrass.	Not suitable	Not suitable.
Oak, hickory, ash, and maple trees.	Oak, dogwood, honeysuckle, and greenbrier.	Grains, clover, and ryegrass.	Oak acorns, grapes, and huckleberry.	Grains, clover, ryegrass, and bahiagrass.	Not suitable	Not suitable.
Oak, dogwood, hickory, ash, and maple trees.	Oak, dogwood, honeysuckle, and greenbrier.	Grains, clover, and corn.	Oak acorns, grapes, and huckleberry.	Grains, grass, clover, and bahiagrass.	Not suitable	Not suitable.

Use of Soils for Engineering [5]

This section deals with soil as construction material. It explains the physical and chemical properties of the soils as they affect the construction and maintenance of roads, airports, pipelines, and building foundations and of structures for water storage, erosion control, drainage, and sewage disposal. Among the soil properties considered as most important are permeability to water, strength against shearing, ease or difficulty of compaction, texture, shrink-swell potential, plasticity, and reaction (pH). Also important are topography and the depth to consolidated material. The information in this survey can be used to:

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils that will aid in planning agricultural drainage systems, farm ponds, irrigation systems, terraces, waterways, and diversion terraces.

In table 5 the physical and chemical properties of the soil are estimated. Such properties are USDA textures, engineering classifications, and reaction or pH. In table 6 the suitability of the soils as a source of construction materials is rated and the soil features affecting the location and construction of highways, dikes or levees, farm ponds, drainage systems, irrigation systems, terraces, and waterways are noted. Table 7 contains test data for Longview and Sumter soils.

Engineering classification systems

The two most commonly used systems in classifying samples of soil horizons for engineering are the AASHO system adopted by the American Association of State Highway Officials (*1*) and the Unified Soil Classification System (*14*) used by the Soil Conservation Service engineers, Department of Defense, and others. Both are used in this survey and are explained in the following paragraphs.

The AASHO system is used to classify soils according to those properties that affect use in highway construction. In this system, a soil is placed in one of seven basic

TABLE 5.—*Estimated physical and*

[An asterisk in the first column indicates that at least one mapping unit is made up of two or more kinds of soil. Because these soils may first column

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification
			USDA texture

chemical properties of soils

have different properties and limitations, it is necessary to follow carefully the instructions for referring to other series that appear in the of this table]

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 10	No. 40	No. 200				
					Inches per hour	*Inches per inch of soil*	*pH*	
ML	A-4	100	90-100	70-90	0. 63-2. 00	0. 20-0. 22	4. 5-5. 5	Low.
ML, CL	A-7 or A-6	100	95-100	85-95	0. 20-0. 63	0. 20-0. 22	4. 5-5. 5	Moderate.
CL	A-7	100	95-100	85-95	0. 06-0. 20	0. 20 0. 22	4. 5-5. 5	Moderate.
CH	A-7	100	95-100	85-95	0. 06-0. 20	0. 10-0. 15	7. 4-8. 4	High.
SM, ML	A-4	100	75-85	40-55	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
CH	A-7	100	95-100	75-95	<0. 06	0. 15-0. 20	4. 0-5. 5	High.
CH	A-7	100	95-100	90-100	0. 06-0. 20	0. 18-0. 20	5. 6-6. 5	Very high.
CH	A-7	100	90-100	85-95	<0. 06	0. 15-0. 20	6. 5-8. 4	Very high.
CH	A-7	100	95-100	90-100	0. 06-0. 20	0. 19-0. 22	6. 1-7. 5	High.
CH	A-7	100	90-100	75-85	0. 06-0. 20	0. 15-0. 20	6. 1-8. 4	High.
CH	A-7	100	95-100	85-95	0. 06-0. 20	0. 18-0. 20	6. 1-8. 4	High.
ML	A-4	100	90-100	70-90	0. 63-2. 00	0. 20-0. 22	4. 5-5. 5	Low.
ML, CL	A-6	100	95-100	90-100	0. 63-2. 00	0. 19-0. 22	4. 5-5. 5	Low to moderate.
CH	A-7	100	95-100	90-100	0. 06-0. 20	0. 16-0. 18	4. 5-5. 5	High.
CH	A-7	100	90-100	90-100	0. 06-0. 20	0. 15-0. 20	4. 5-5. 5	High.
SM, ML	A-4	100	75-85	40-55	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
ML	A-6	100	80-90	60-75	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Low.
CL	A-6	100	90-100	70-80	0. 06-0. 20	0. 12-0. 18	4. 5-5. 5	Moderate.
CH	A-7	100	95-100	85-95	0. 00-0. 20	0. 15-0. 20	6. 6-7. 5	Very high.
CH	A-7	100	90-100	85-95	<0. 06	0. 15-0. 20	6. 6-8. 4	Very high.
CL	A-7, A-6	100	95-100	85-95	0. 20-0. 63	0. 20-0. 22	4. 5-5. 5	Moderate.
CH	A-7	100	95-100	85-95	0. 00-0. 20	0. 19-0. 21	4. 5-7. 3	High.
CH	A-7	100	95-100	85-95	0. 20-0. 63	0. 20-0. 22	5. 6-8. 4	Moderate.
CH	A-7	100	95-100	85-95	0. 06-0. 20	0. 18-0. 20	5. 6-8. 4	High.
CH	A-7	100	90-100	85-95	0. 06-0. 20	0. 15-0. 20	7. 4-8. 4	High.
ML	A-4	100	90-100	70-95	0. 63-2. 00	0. 15-0. 20	4. 5-5. 5	Low.
ML, CL	A-6	100	90-100	70-90	0. 06-0. 20	0. 05-0. 10	4. 5-5. 5	Low.
CH	A-7	100	95-100	85-95	0. 06-0. 20	0. 10-0. 15	4. 5-5. 5	Moderate.
SM, ML	A-4	100	75-85	40-55	0. 63-2. 00	0. 10-0. 15	4. 5-6. 5	Low.
CH, CL	A-7	100	90-100	75-85	0. 20-0. 63	0. 15-0. 20	4. 5-6. 5	Moderate.
ML, CL	A-6	100	80-90	60-75	0. 20-0. 63	0. 10-0. 15	4. 5-6. 5	Low.
SM-ML	A-4	100		40-55	0. 63-2. 00	0. 10-0. 15	4. 5-6. 5	Low.
ML	A-4	100	80-90	60-75	0. 63-2. 00	0. 14-0. 18	4. 5-5. 5	Low.
ML, SM	A-4	100	75-85	40-55	0. 63-2. 00	0. 10-0. 15	5. 6-8. 4	Low.
SC	A-6	100	85-95	35-50	0. 63-2. 00	0. 15-0. 20	5. 6-8. 4	Low to moderate.
ML	A-4	100	90-100	70-90	0. 63-2. 00	0. 20-0. 23	4. 5-5. 5	Low.
ML, CL	A-6	100	90-100	80-90	0. 63-2. 00	0. 20-0. 23	4. 5-5. 5	Low to moderate.
CL	A-7	100	95-100	85-95	0. 63-2. 00	0. 20-0. 23	4. 5-5. 5	Moderate.
ML	A-4	100	90-100	70-90	0. 63-2. 00	0. 08-0. 20	4. 5-5. 5	Low.
ML	A-4	100	90-100	70-90	0. 20-0. 63	0. 10-0. 20	4. 5-5. 5	Low.

TABLE 5.—*Estimated physical and*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification: USDA texture
	Inches	*Inches*	
Ochlockonee: Oc	>30	0–7	Loam
		7–28	Silt loam
		28–52	Loam
Oktibbeha: OlB2, OlC2, OtE3	>24	0–4	Silty clay
		4–34	Clay or silty clay
		34–45	Clay
		45–60	Very firm chalk.
Oktibbeha series, thick solum variant: OhC2	>24	0–9	Fine sandy loam
		9–55	Clay; clay loam
Prentiss: PnA, PnB	20	0–23	Silt loam
		23–52	Silt loam (fragipan)
		52–60	Silty clay loam (fragipan)
Providence: PsB2, PsC2, PsC3	20	0–4	Silt loam
		4–21	Silty clay loam
		21–45	Silty clay loam (fragipan)
		45–60	Silty clay loam
*Ruston: RtB, RuE For Maben part of RuE, see Maben series.	>60	0–15	Fine sandy loam
		15–32	Sandy clay loam
		32–55	Sandy loam; loam
		55–80	Loam; sandy loam
Savannah: SaB2, SaC2, SaD2	20	0–4	Fine sandy loam
		4–22	Loam
		22–60	Loam; sandy clay loam
Sessum: Se	0	0–6	Silty clay loam
		6–58	Clay
		58–85	Clay
Stough: St	12	0–8	Fine sandy loam
		8–18	Loam
		18–47	Loam (fragipan)
		47–60	Loam (fragipan)
*Sumter: SuC2, SuD2, SvB2, SvC2 For Binnsville part of SvB2 and SvC2, see Binnsville series.	>30	0–5	Silty clay loam
		5–20	Silty clay
		20–34	Marly clay
		34–60	Chalk.
Urbo: Ur	12	0–5	Silty clay loam
		5–55	Silty clay
Wilcox: WcA, WlB2, WlC2, WlD2, WlF2	12	0–4	Silty clay loam
		4–8	Silty clay
		8–42	Clay
		42–60	Shaly clay

chemical properties of soils—Continued

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 10	No. 40	No. 200				
					Inches per hour	*Inches per inch of soil*	*pH*	
ML	A-4	100	80-90	60-75	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
SM	A-4	100	60-70	40-50	0. 63-2. 00	0. 09-0. 12	4. 5-5. 5	Low.
ML	A-4	100	80-90	60-75	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
CL-CH	A-6	100	95-100	80-95	0. 20-0. 63	0. 15-0. 20	4. 5-5. 5	Low to moderate.
CH	A-7	100	95-100	85-95	0. 00-0. 20	0. 15-0. 20	4. 5-5. 5	High.
CH	A-7	70	60-80	70-95	0. 00-0. 20	0. 15-0. 20	6. 1-8. 4	High.
SM, ML	A-4	100	75-90	40-55	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
CH	A-7	100	90-100	75-95	0. 00-0. 20	0. 15-0. 20	4. 5-5. 5	Moderate to high.
ML	A-4	100	90-100	70-85	0. 63-2. 00	0. 10-0. 20	4. 5-5. 5	Low.
ML	A-4	100	90-100	70-85	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Low.
ML, CL	A-6	100	95-100	80-90	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Low.
ML	A-4	100	90-100	70-90	0. 63-2. 00	0. 20-0. 22	4. 5-5. 5	Low.
CL	A-6, A-7	100	95-100	85-95	0. 63-2. 00	0. 20-0. 22	4. 5-5. 5	Moderate.
ML, CL	A-6	100	95-100	85-95	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Moderate.
CH	A-7	100	95-100	85-100	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Moderate to high.
SM, ML	A-4	100	70-80	40-55	0. 63-2. 00	0. 14-0. 16	4. 5-6. 0	Low.
SC, CL	A-6	100	75-85	35-55	0. 63-2. 00	0. 15-0. 17	4. 5-6. 0	Low.
SM	A-4, A-2	100	65-85	30-40	0. 63-2. 00	0. 10-0. 15	4. 5-6. 0	Low.
ML, CL	A-4, A-6	100	65-85	60-75	0. 63-2. 00	0. 14-0. 16	4. 5-6. 0	Low.
SM, ML	A-4	100	75-85	40-55	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
ML	A-6	100	80-90	60-75	0. 63-2. 00	0. 10-0. 15	4. 5-5. 5	Low.
ML	A-6	100	85-95	60-75	0. 20-0. 63	0. 10-0. 15	4. 5-5. 5	Low.
CH	A-7	100	95-100	85-95	0. 06-0. 20	0. 15-0. 20	4. 5-6. 0	Very high.
CH	A-7	100	90-100	90-100	<0. 06	0. 15-0. 20	4. 5-6. 0	Very high.
CH	A-7	100	90-100	90-100	<0. 06	0. 15-0. 20	6. 0-8. 4	Very high.

TABLE 6.—*Interpretations*

[An asterisk in the first column indicates that at least one mapping unit is made up of two or more kinds of soil. Because these soils may first column

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Dikes or levees
Adaton: Ad	Fair	Poor: poor traffic supporting capacity; wetness.	Nearly level; slow internal movement of water; wetness.	Fair strength and stability
Binnsville	Poor	Poor: 20 inches or less to firm chalk; high shrink-swell potential.	20 inches or less to firm chalk.	20 inches or less to firm chalk; high shrink-swell potential.
Boswell: BoB	Fair	Poor: high shrink-swell potential.	High shrink-swell potential	Very slow permeability; subject to cracking when dry.
Brooksville: BrA, BrB	Poor	Poor: very high shrink-swell potential.	Nearly level to gently sloping; plastic clays; very high shrink-swell potential.	Very high shrink-swell potential; fair slope stability; high compressibility.
Catalpa: Cp	Poor	Poor: high shrink-swell potential.	Flood plain; subject to flooding; high shrink-swell potential.	Cracks when dry; difficult to pack properly.
Falkner: FaA, FaB	Fair	Poor: underlain by clay with high shrink-swell potential.	Level to gently sloping; underlain by plastic clay; high water table.	Fair to low strength and stability; high shrink-swell potential in lower subsoil.
Freestone: FrA, FrB	Fair	Fair: fair traffic supporting capacity.	Underlying soil material has moderate shrink-swell potential.	Slow permeability; fair stability and strength.
*Gullied land: GsE. Gullied land too variable to estimate. For Sumter part, see Sumter series.				
Houston: Ho	Poor	Poor: very high shrink-swell potential.	Nearly level slopes; very high shrink-swell potential.	Cracks when dry, very slowly permeable when moist.

of engineering properties

have different properties and limitations, it is necessary to follow carefully the instructions for referring to other series that appear in the of this table]

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankment				
Slow seepage rate	Fair strength and stability; slow seepage rate.	Needs surface drainage; poorly drained.	Slow intake rate; slow permeability.	Nearly level; no erosion hazard.	Very high available water capacity.
20 inches or less to firm chalk; subject to seepage.	20 inches or less to firm chalk; high shrink-swell potential.	Not needed; well drained; slopes.	Slow intake rate; slow permeability.	Firm chalk at a depth of 20 inches or less.	Low available water capacity.

TABLE 6.—*Interpretations*

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Dikes or levees
*Kipling: KlA, KlB2, KlC2, KsF3 For Sumter part of KsF3, see Sumter series.	Poor	Poor: high shrink-swell potential.	Nearly level to moderately sloping; plastic clays; high shrink-swell potential.	High shrink-swell potential; cracks when dry.
Leeper: [illegible]	Poor	Poor: high [illegible]	Flood plain; high shrink [illegible]	Cracks when dry; [illegible]

of engineering properties—Continued

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankment				
Slow to very slow permeability; will support deep water.	Cracks when dry; subject to seepage; difficult to pack properly.	Needs surface drainage on nearly level slopes; somewhat poorly drained.	High initial intake rate when cracked; decreasing intake rate as the soil becomes moist.	Clayey subsoil; difficult to construct.	Plastic clays; grows good sod.
Slowly permeable; will support deep water.	Cracks when dry; difficult to pack properly; subject to seepage.	Needs surface drainage; somewhat poorly drained.	High initial intake rate when cracked; decreasing intake rate as the soil becomes moist.	Nearly level; no erosion hazard.	Plastic clays; grows good sod.
Moderate permeability above the fragipan; slow in the fragipan.	Fair to good strength and stability.	Needs surface drainage; drainage difficult due to fragipan.	Slow intake rate; moderate permeability above fragipan.	Soil properties favorable; easy to construct.	Medium available water capacity; grows good sod when fertilized.
Subject to seepage in some areas.	Fair strength and stability.	Not needed; well drained; slopes.	Moderate intake rate; moderately slow permeability.	Soil properties favorable on moderate slopes; easy to construct.	Medium to high available water capacity.
Moderate permeability; chance of seepage.	Fair strength and stability.	Needs surface drainage; high water table; somewhat poorly drained.	Moderate intake rate and moderate permeability.	Nearly level; no erosion hazard.	Medium to high available water capacity.
Subject to excess seepage in some areas.	Moderate permeability; fair strength and stability.	Needs surface drainage; nearly level slopes; subject to flooding.	Moderate intake rate and moderate permeability.	Nearly level; no erosion hazard.	Grows good sod; high available water capacity.
Moderate permeability.	Fair strength and stability.	Needs surface drainage; high water table.	Slow intake rate; moderate permeability.	Nearly level; no erosion hazard.	High water table; very high available water capacity.
Moderately slow permeability; high water table.	Fair strength and stability.	Needs surface drainage; high water table.	Moderate to slow intake rate; moderately slow permeability.	Nearly level; no erosion hazard.	High water table; grows good sod when fertilized.
Subject to excessive seepage in some areas.	Fair strength and stability; some seepage likely.	Needs surface drainage; nearly level slopes; subject to flooding.	Moderate intake rate and moderate permeability.	Nearly level; no erosion hazard.	Medium available water capacity; grows good sod.
Very slow to slow permeability; will support deep water.	Fair to low strength and stability; cracks when dry.	Not needed; moderately well drained; slopes.	High initial intake rate when cracked; decreasing intake rate as soil becomes moist.	Clayey subsoil; difficult to construct.	Plastic clays; sod sometimes difficult to establish, but grows well.
Very slow to slow permeability; will support deep water.	Fair to low strength and stability.	Not needed; moderately well drained; slopes.	Moderate intake rate; slow to very slow permeability.	Clayey subsoil; difficult to construct.	Sod sometimes difficult to establish but grows well.

TABLE 6.—*Interpretations*

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Dikes or levees
Prentiss: PnA, PnB	Fair to good.	Fair: fair traffic supporting capacity.	Fragipan causes perched water table.	Moderate permeability above fragipan; good stability.
Providence: PsB2, PsC2, PsC3	Fair	Fair: fair traffic supporting capacity.	Fragipan causes perched water table.	Moderate permeability above fragipan; fair strength and stability.
*Ruston: RtB, RuE. For Maben part of RuE see Maben series.	Fair	Fair to good: fair traffic supporting capacity.	Soil properties favorable; gently to very steeply sloping.	Fair to good stability and strength.
Savannah: SaB2, SaC2, SaD2	Fair	Fair: fair traffic supporting capacity.	Fragipan causes perched water table; fair traffic supporting capacity.	Fair to good stability and strength.
Sessum: Se	Poor	Poor: very high shrink-swell potential.	Poorly drained; clay with very high shrink-swell potential.	Cracks when dry; very slow permeability when moist.
Stough: St	Fair	Fair: fair traffic supporting capacity.	Perched water table; drainage impeded by fragipan.	Fair stability and strength
*Sumter: SuC2, SuD2, SvB2, SvC2. For Binnsville part of SvB2 and SvC2 see Binnsville series.	Poor	Poor: high shrink-swell potential.	Plastic clays over marl or chalk; high shrink-swell potential.	Plastic clays over marl or chalk.
Urbo: Ur	Poor	Poor: high shrink-swell potential.	High water table; high shrink-swell potential; subject to flooding.	Very slow permeability; high shrink-swell potential.
Wilcox: WcA, WlB2, WlC2, WlD2, WlF2.	Poor	Poor: very high shrink-swell potential.	Very high shrink-swell potential.	Very slow permeability; very high shrink-swell potential.

of engineering properties—Continued

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankment				
Excessive seepage in some areas below fragipan.	Fair strength and stability; piping and erosion.	Needs surface drainage on nearly level slopes; perched water table.	Moderate to slow intake rate; moderate permeability above fragipan; medium available water capacity.	Soil properties favorable; easy to construct.	Medium available water capacity.
Moderately slow permeability in fragipan and lower horizons.	Fair strength and stability; piping and erosion.	Not needed; moderately well drained; slopes.	Slow intake rate; moderate permeability above the fragipan.	Fragipan at 27 inches; soil properties favorable; easy to construct.	Medium available water capacity.
Excessive seepage in some areas.	Fair to good strength and stability.	Not needed; well drained; slopes.	High intake rate; moderate permeability and medium available water capacity.	Soil properties favorable on moderate slopes; easy to construct.	Grows good sod when fertilized; medium available water capacity.
Excessive seepage in some areas below fragipan.	Fair to good strength and stability.	Not needed; moderately well drained; slopes.	Moderate intake rate; moderately slow permeability; medium available water capacity.	Soil properties favorable; easy to construct.	Medium available water capacity; easy to vegetate.

TABLE 7.—*Engineering*

[Tests performed by Mississippi State Highway Department, in cooperation with the Bureau of Public Roads, U.S. Department of

Soil name and location	Parent material	Mississippi State highway laboratory Nos.	Depth from surface	Moisture-density data [1]	
				Maximum dry density	Optimum moisture
			Inches	*Lb. per cu. ft.*	*Percent*
Longview silt loam, 4½ miles southwest of Starkville, NE1/4NW1/4 sec. 32, T. 18 N., R. 14 E.	Loamy material.	534160	55–72	101	20
		534159	18–26	106	17
Sumter silty clay loam, 330 yds. north of State Highway No. 25, 230 ft. west of Clay County line, SE1/4NE1/4 sec. 12, T. 19 N., R. 15 E.	Marly clay over chalk.	534155	8–20	99	21
		534156	34–60	96	24

[1] Moisture density according to AASHO Designation: T–99–57, Method A (*1*).

[2] Mechanical analysis according to AASHO Designation: T–88–57 (*1*); results by this procedure may differ from results obtained by the soil survey procedures of the Soil Conservation Service. In the AASHO procedure the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS procedure the fine material is analyzed by the pipette method, and material coarser than 2 millimeters is excluded

Some of the soil features that affect the location of flooding, permeability, and the level of the water table.

test data

Commerce, in accordance with standard procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Mechanical analysis [2]							Liquid limit	Plasticity index	Classification	
Percentage passing sieve—			Percentage smaller than—						AASHO	Unified [3]
No. 10 (2.0	No. 40 (0.42	No. 200 (0.074	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				

TABLE 8.—*Degree of limitation of*

[Dashes indicate soil properties are too

Soil series and map symbols	Dwellings with—		Recreational uses
	Public or community sewage systems	Septic tank filter fields	Campsites
Adaton: Ad	Severe: moderate shrink-swell potential; high water table.	Severe: moderate shrink-swell potential; slow permeability.	Severe: excess wetness
Boswell: BoB	Severe: high shrink-swell potential.	Severe: high shrink-swell potential; very slow permeability.	Moderate: fair trafficability.
Brooksville: BrA, BrB	Severe: very high shrink-swell potential.	Severe: very high shrink-swell potential; very slow permeability.	Severe: poor trafficability.
Catalpa: Cp	Severe: subject to flooding; high shrink-swell potential.	Severe: subject to flooding; high shrink-swell potential.	Severe: poor trafficability.
Falkner: FaA, FaB	Severe: excess wetness; high shrink-swell potential.	Severe: slow permeability; high shrink-swell potential.	Moderate: excess wetness; fair trafficability.
Freestone: FrA, FrB	Severe: excess wetness; moderate shrink-swell potential.	Severe: slow permeability; moderate shrink-swell potential.	Moderate: excess wetness; fair trafficability.
Gullied land: GsE			
Houston: Ho	Severe: very high shrink-swell potential.	Severe: very high shrink-swell potential; very slow permeability.	Severe: poor trafficability.
Kipling: KlA, KlB2, KlC2	Severe: high shrink-swell potential.	Severe: slow to very slow permeability; high shrink-swell potential.	Severe: clayey surface; poor trafficability.
KsF3	Severe: high shrink-swell potential; 17 to 40 percent slopes.	Severe: slow to very slow permeability; high shrink-swell potential; 17 to 40 percent slopes.	Severe: poor trafficability; 17 to 40 percent slopes.
Leeper: Le	Severe: subject to flooding; high shrink-swell potential.	Severe: subject to flooding; slow permeability; high shrink-swell potential.	Severe: poor trafficability.
Longview: LoA, LoB	Severe: excess wetness	Severe: perched water table; excess wetness; slow permeability.	Moderate: excess wetness.
Maben: MbC2, MbD2	Moderate: 5 to 12 percent slopes.	Severe: moderately slow permeability.	Slight: 5 to 8 percent slopes. Moderate: 8 to 12 percent slopes.
MeD	Moderate: 8 to 12 percent slopes.	Severe: moderately slow permeability.	Moderate: 8 to 12 percent slopes.
MrF	Severe: slope greater than 12 percent.	Severe: slope greater than 12 percent.	Severe: 12 to 30 percent slopes.
Mantachie: Ms	Severe: subject to flooding; seasonally high water table.	Severe: subject to flooding; seasonally high water table.	Severe: subject to flooding.

soils for town and country planning

variable to be rated]

Recreational uses—Continued		Light industries	Trafficways
Picnic areas	Intensive play areas		
Severe: excess wetness	Severe: excess wetness	Severe: excess wetness; moderate shrink-swell potential.	Severe: excess wetness.
Moderate: fair trafficability	Moderate: fair trafficability; slope 2 to 5 percent.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Severe: poor trafficability	Severe: poor trafficability	Severe: very high shrink-swell potential.	Severe: very high shrink-swell potential.
Severe: poor trafficability	Severe: poor trafficability	Severe: subject to flooding; high shrink-swell potential.	Severe: subject to flooding; high shrink-swell potential.
Moderate: excess wetness; fair trafficability.	Moderate to severe: excess wetness.	Severe: high shrink-swell potential.	Severe: excess wetness; high shrink-swell potential.
Moderate: excess wetness; fair trafficability.	Moderate to severe: excess wetness.	Severe: excess wetness; moderate shrink-swell potential.	Severe: excess wetness; moderate shrink-swell potential.
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Severe: poor trafficability	Severe: poor trafficability; very slow permeability.	Severe: very high shrink-swell potential.	Severe: very high shrink-swell potential.
Severe: poor trafficability	Severe: poor trafficability; slow to very slow permeability.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Severe: poor trafficability; 17 to 40 percent slopes.	Severe: poor trafficability; 17 to 40 percent slopes.	Severe: high shrink-swell potential; 17 to 40 percent slopes.	Severe: high shrink-swell potential; 17 to 40 percent slopes.
Severe: poor trafficability	Severe: slow permeability	Severe: subject to flooding; high shrink-swell potential.	Severe: subject to flooding; high shrink-swell potential.
Moderate: excess wetness; fair trafficability.	Moderate: excess wetness	Severe: excess wetness	Severe: excess wetness; perched water table.
Slight: 5 to 8 percent slopes. Moderate: 8 to 12 percent slopes.	Severe: moderately slow permeability; slope greater than 5 percent.	Moderate: 5 to 8 percent slopes. Severe: 8 to 12 percent slopes.	Moderate: fair to poor traffic supporting capacity.
Moderate: 8 to 12 percent slopes.	Severe: moderately slow permeability; 8 to 12 percent slopes.	Severe: 8 to 12 percent slopes.	Moderate: fair to poor trafficability.
Severe: 12 to 30 percent slopes.	Severe: slope of 12 to 30 percent.	Severe: slope of 12 to 30 percent.	Moderate: 12 to 17 percent slopes. Severe: 17 to 30 percent slopes.
Moderate: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; seasonally high water table.	Severe: seasonally high water table; subject to flooding.

TABLE 8.—*Degree of limitation of*

Soil series and map symbols	Dwellings with—		Recreational uses
	Public or community sewage systems	Septic tank filter fields	Campsites
Marietta: Mt	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.
Mathiston: Mu	Severe: seasonally high water table: subject to flooding.	Severe: subject to flooding; seasonally high water table.	Severe: subject to flooding.
Myatt: My	Severe: high water table; excess wetness.	Severe: high water table; excess wetness.	Severe: excess wetness; may flood.
Ochlockonee: Oc	Severe: subject to flooding.	Severe: subject to flooding.	Moderate to severe: subject to flooding.
Oktibbeha:			
OlB2, OlC2	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.	Moderate: slow to very slow permeability.
OtE3	Severe: high shrink-swell potential.	Severe: slow to very slow permeability; high shrink-swell potential.	Moderate: fair trafficability; 8 to 12 percent slopes. Severe: 12 to 17 percent slopes.
Oktibbeha, thick solum variant: OhC2	Severe: moderate to high shrink-swell potential.	Severe: slow to very slow permeability; moderate to high shrink-swell potential.	Moderate: fair trafficability.
Prentiss: PnA, PnB	Moderate: perched water table.	Severe: moderately slow permeability; perched water table.	Slight
Providence:			
PsB2	Moderate: moderate to high shrink-swell potential.	Severe: moderately slow permeability; moderate to high shrink-swell potential.	Slight
PsC2	Moderate: moderate to high shrink-swell potential.	Severe: moderately slow permeability; moderate to high shrink-swell potential.	Slight
PsC3	Moderate: moderate to high shrink-swell potential.	Severe: moderately slow permeability; moderate to high shrink-swell potential.	Slight
Ruston:			
RtB	Slight	Slight	Slight
RuE	Severe: 12 to 30 percent slopes.	Severe: 12 to 30 percent slopes.	Severe: greater than 12 percent slope.
Savannah: SaB2, SaC2, SaD2	Moderate: perched water table.	Severe: perched water table; moderately slow permeability.	Slight: slopes less than 8 percent. Moderate: slopes more than 8 percent.
Sessum: Se	Severe: very high shrink-swell potential.	Severe: very slow permeability; very high shrink-swell potential.	Severe: excess wetness

soils for town and country planning Continued

Recreational uses—Continued		Light industries	Trafficways
Picnic areas	Intensive play areas		
Moderate: subject to flooding.	Severe: subject to flooding	Severe: subject to flooding; seasonally high water table.	Severe: seasonally high water table; subject to flooding.
Moderate: subject to flooding.	Severe: subject to flooding	Severe: subject to flooding; seasonally high water table.	Severe: subject to flooding; seasonally high water table.
Moderate: excess wetness; may flood.	Severe: excess wetness; may flood.	Severe: high water table; excess wetness.	Severe: high water table; excess wetness.
Moderate: subject to flooding.	Moderate: subject to flooding	Severe: subject to flooding	Severe: subject to flooding.
Moderate: fair trafficability	Severe: slow to very slow permeability.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Moderate: fair trafficability; 8 to 12 percent slopes. Severe: 12 to 17 percent slopes.	Severe: slow to very slow permeability; 8 to 17 percent slopes.	Severe: high shrink-swell potential; 8 to 17 percent slopes.	Severe: high shrink-swell potential.
Moderate: fair trafficability	Severe: slow to very slow permeability.	Severe: moderate to high shrink-swell potential.	Severe: moderate to high shrink-swell potential.
Slight	Moderate: moderately slow permeability.	Moderate: moderate bearing strength.	Moderate: moderate traffic-supporting capacity.
Slight	Moderate: moderately slow permeability.	Moderate: moderate to high shrink-swell potential.	Moderate: moderate traffic-supporting capacity; moderate to high shrink-swell potential.
Slight	Severe: 5 to 8 percent slopes; moderately slow permeability.	Moderate: moderate to high shrink-swell potential; 5 to 8 percent slopes.	Moderate: moderate traffic-supporting capacity; moderate to high shrink-swell potential.
Slight	Severe: moderately slow permeabiltiy; 5 to 8 percent slopes.	Moderate: moderate to high shrink-swell potential; 5 to 8 percent slopes.	Moderate: moderate traffic-supporting capacity; moderate to high shrink-swell potential.
Slight	Moderate: 2 to 5 percent slopes.	Slight	Slight.
Severe: 12 to 30 percent slopes.	Severe: excessive slope	Severe: excessive slopes	Moderate: slope to 17 percent. Severe: slope greater than 17 percent.
Moderate: 2 to 5 percent slopes. Severe: 5 to 12 percent slopes.	Moderate: 2 to 5 percent slopes. Severe: 5 to 12 percent slopes.	Slight: slope to 5 percent. Moderate: 5 to 8 percent slopes. Severe: slope greater than 8 percent.	Moderate: moderate trafficability.
Severe: excess wetness	Severe: excess wetness; very slow permeability.	Severe: excess wetness; very high shrink-swell potential.	Severe: excess wetness; very high shrink-swell potential.

TABLE 8.—*Degree of limitation of*

Soil series and map symbols	Dwellings with—		Recreational uses
	Public or community sewage systems	Septic tank filter fields	Campsites
Stough: St	Severe: excess wetness	Severe: very high water table; moderately slow permeability.	Moderate: excess wetness.
Sumter:			
SuC2, SuD2	Severe: high shrink-swell potential.	Severe: slow permeability; high shrink-swell potential.	Severe: silty clay loam and silty clay surface; poor trafficability.
SvB2, SvC2	Severe: high shrink-swell potential.	Severe: slow permeability; high shrink-swell potential.	Severe: poor trafficability
Urbo: Ur	Severe: excess wetness; subject to flooding; high to very high shrink-swell potential.	Severe: excess wetness; subject to flooding; high to very high shrink-swell potential.	Severe: excess wetness; poor trafficability.
Wilcox:			
WcA	Severe: excess wetness; very high shrink-swell potential.	Severe: excess wetness; very slow permeability; very high shrink-swell potential.	Severe: excess wetness; moderate trafficability.
WlB2, WlC2, WlD2	Severe: excess wetness; very high shrink-swell potential.	Severe: excess wetness; very slow permeability; very high shrink-swell potential.	Moderate: excess wetness; moderate trafficability.
WlF2	Severe: excessive slope; very high shrink-swell potential.	Severe: excessive slope; very high shrink-swell potential; very slow permeability.	Severe: slope of 12 to 35 percent.

Campsites are areas suitable for pitching tents and for living outdoors for at least a week. Little preparation of the soils at a site is required. Wetness is a serious limitation. Favorable features are an attractive landscape, good foot trafficability, and at least moderate stands of grass and trees. Limitations of soils used for campsites are slight if (1) the slope is 0 to 8 percent; (2) trafficability is good; and (3) inherent erodibility is slight to moderate.

Limitations for campsite use are moderate if (1) the slope is 8 to 12 percent; (2) trafficability is fair; and (3) inherent erodibility is severe.

Limitations for campsite use are severe if (1) the slope is more than 12 percent; (2) trafficability is poor; or (3) inherent erodibility is very severe.

Picnic areas are areas suitable for pleasure outings at which a meal is eaten out of doors. Picnic tables and fireplaces are usually furnished, and little site preparation should be needed. The chief requirements are (1) an attractive landscape; (2) good foot trafficability; and (3) suitable slope (fig. 8).

Limitations of soils used for picnic areas are slight if (1) the slope is 0 to 8 percent; (2) trafficability is good; and (3) inherent erodibility is slight to moderate.

Limitations are moderate if (1) the slope is 8 to 12 percent; (2) trafficability is fair; and (3) inherent erodibility is severe.

Limitations for picnic areas are severe if (1) the slope is more than 12 percent; (2) trafficability is poor; or (3) inherent erodibility is very severe.

Intensive play areas are areas formed for playgrounds and for baseball diamonds, tennis and badminton courts, and other sites for other organized games. These soils are subject to intensive foot traffic. Generally required are nearly level surface, good drainage, and a firm surface. The area should be free of coarse fragments and rock outcrops.

The limitations of soils used for intensive play areas are slight if (1) the slope is less than 2 percent; (2) depth to the fragipan or claypan is more than 36 inches; (3) the trafficability is good; (4) permeability is very rapid through moderate.

Limitations for intensive play areas are moderate if (1) the slope is 2 to 5 percent; (2) the fragipan or claypan is not above a depth of 36 inches; (3) the trafficability is fair; or (4) permeability is moderately slow or slow.

The limitations for intensive play areas are severe if (1) the slope is more than 5 percent; (2) a fragipan or claypan is at a depth of 10 to 36 inches; (3) the

soils for town and country planning—Continued

Recreational uses—Continued		Light industries	Trafficways
Picnic areas	Intensive play areas		
Moderate: excess wetness	Moderate: excess wetness; water table below depth of 20 inches during peak use.	Severe: excess wetness	Moderate to severe: excess wetness; perched water table.
Severe: poor trafficability	Severe: poor trafficability	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Severe: poor trafficability	Severe: poor trafficability	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.
Severe: excess wetness; poor trafficability.	Severe: excess wetness; poor trafficability.	Severe: excess wetness; subject to flooding; high to very high shrink-swell potential.	Severe: excess wetness; subject to flooding; high to very high shrink-swell potential.
Moderate: excess wetness; fair trafficability.	Severe: very slow permeability.	Severe: excess wetness; very high shrink-swell potential.	Severe: very high shrink-swell potential; excess wetness.

Parent material

All the parent material of Oktibbeha County is of marine or Coastal Plain origin except the more recent, alluvial sediments in valleys along the streams. There are three distinctly different Coastal Plain Formations in the county. These are Selma Chalk, Porters Creek Clay, and the Wilcox Formation. Materials from these different geological formations have influenced the texture, mineralogy, and inherent fertility of the soils.

The soils in the eastern part of the county developed from marl or chalk and clays over the marl. These materials have been reworked and deposited by stream action in the flood plains of the Blackland part of Oktibbeha County. This part of the county is in the Alabama and Mississippi Blackland Prairies. Most of the soils have inherited a high content of montmorillonite clay, much calcium carbonate, and a fairly high level of plant nutrients. The Houston and Brooksville soils have these

Climate

Rainfall and temperature are the two major components of climate and both of these are active factors in soil formation. They influence the rates of weathering of parent materials and the decomposition of minerals. They also influence leaching, migration of fine particles, and illuviation. Therefore climate has had a direct influence in the genesis of the soils of this county. It also has had indirect effects, since climate governs to a great extent the kinds of plants and animals that thrive on and in the soil.

The climatic effects are uniform over Oktibbeha County because the climate is the same over the entire area. (The average rainfall is about 50 inches per year, and the average temperature is about 65° F.) Organic matter decomposes at a rapid rate, and the high rainfall causes much leaching. This process tends to make the soils acid in reaction. Many of the soils of the Blackland

soils of the Interior Flatwoods and Sand-Clay Hills developed under forest cover and have this characteristic. Soils like Maben, Savannah, Longview, and Wilcox have most of the organic-matter content in the A horizon. Under native grasses the fibrous roots decay and add organic matter within the profile as deep as the roots grow. This process causes soils that form under native grasses to have a thick A horizon of dark color that extends as much as 2 feet deep.

Some of the upland soils of the Blackland Prairie, such as Houston and Brooksville, formed under grasses. These soils have a dark-colored, thick A horizon and are locally called "black prairie" soils. All the other soils of Oktibbeha County formed under forest conditions. Hardwoods (post oak, hackberry, red oak, and hickory), under which the Kipling and Oktibbeha soils formed, covered the forest sites of the Blackland Prairie. Loblolly and short-leaf pine, oak, and hickory provided

the subsoil. The combination of A and B horizons is called the solum.

All of the major horizons of a soil profile may be subdivided into minor horizons. These are identified in morphological studies by subscription, as follows: A1, A2, Ap, B1, B2, B3, and Bx. The subdivisions of the major horizons provide clues to the soil-forming factors that have left marks in the profiles and are important in classification and the use and management of the soils.

The A horizon is at the surface and is commonly called the surface soil. It has the greatest organic-matter content and is the horizon in which biological processes are most active. It is also the horizon that rain reaches first and therefore has undergone the most severe leaching, and normally has lost most of its soluble material. Also, the finely divided mineral material, or clay, has been removed from some soils, as well as oxides of aluminum

the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 9 shows the classification of each soil series of

Six soil orders are represented in Oktibbeha County. These are: Entisols, Vertisols, Inceptisols, Mollisols, Alfisols, and Ultisols.

Entisols are young or recent soils that do not have genetic horizons or have only the beginnings of such horizons. The Ochlockonee soils are in this order. These soils occur on flood plains.

Vertisols are soils high in swelling and shrinking clays

seem to produce classes having the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation.

Great Group: Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated, or those that have fragipans that interfere in the growth of roots or the movement of water. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like.

Subgroup: Great groups are divided into subgroups, one representing the central (typic) segment of a group, and others, called intergrades, that have properties of one great group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of another great group, subgroup, or order.

Family: Families are separated within a subgroup primarily on the basis of properties important to the

Series: The series is a group of soils having major horizons that, except for the texture of the surface layer, are similar in important characteristics and arrangement in the profile. The soil series generally is given the name of a geographic location near the place where a soil of that series was first observed and mapped. An example is the Brooksville series.

Mineralogy of Soils and Parent Material[7]

The approximate mineral composition of clays in Oktibbeha County soils is given in table 10. Soils in eastern Oktibbeha County lie within the Mississippi Blackland Prairie. These soils were formed from Cretaceous marls, calcareous clays, and silty clays. Locally these Cretaceous materials are referred to as chalk. The common soils of the area are Houston, Sumter, Catalpa, and Brooksville. There are also areas of Kipling and Sessum soils distributed among the soils throughout the Blackland Prairie. These latter soils were formed from thin caps of acid clays overlying the Cretaceous sediments. These soils all have fine-textured subsoil having a clay content ranging as high as 40 to 60 percent. About 60 percent of the clay consists of the expansible type layer silicates, montmorillonite, and vermiculite (5). Dioctahedral montmorillonite

montmorillonite gives these soils high cation-exchange capacities and high shrink-swell potentials.

Kaolinite makes up 20 to 25 percent of the clay and is mostly of 2 to 0.2 micron size. The Kaolinite is inherited from the parent sediments instead of being formed through weathering of other minerals. The remainder of the clay consists of mica, quartz, and amorphous material. Most of the soils also contain minute amounts of chlorite. The chlorite is mostly pedogenic from vermiculite in the acid soils, but is probably inherited from the parent material in the neutral and alkaline soils.

The total potassium content of soils in the Blackland Prairie, to a depth of 6 inches, ranges from 10,000 to 20,000 pounds per acre and occurs mostly in mica minerals. Calculations were based on total clay content, and K_2O allocations to mica account for practically all K_2O in the soils. Microscope examinations of coarse silts and sands reveal only a few grains of feldspar minerals. The vermiculite in clays of the nonacid soils has a high potassium-fixing capacity. This capacity to fix potassium has been reduced in the acid soils by absorption of complex aluminum molecules on exchange sites between vermiculite layers.

The parent material of the soils of the Blackland Prairie has a carbonate content ranging from 50 to 85 percent. X-ray examinations of the carbonates from several areas show complete absence of dolomite. The clay minerals are also low in magnesium, which, in turn, is only slowly released by weathering. The plant-available magnesium content of these soils is, therefore, extremely low, and crops often require magnesium fertilization.

In central Oktibbeha County, to the north and south of Starkville, there occurs a narrow band of soils derived from Clayton Formation sediments overlying Prairie Bluff Chalk. Soils derived from Clayton Formation are redder than Blackland Prairie soils and somewhat coarser in texture. The principal soil from Clayton sediments is in noticeable quantities but in lower amounts than is observed in soils of Blackland Prairie. Where soils from terrace material mixed with Porter's Creek material, their clays are higher in kaolinite and also contain substantial amounts of pedogenic chlorite. Typical soils formed in Porter's Creek material contain only small amounts of chlorite but are high in exchangeable aluminum.

The Wilcox sediments that overlie the Porter's Creek Formation along the western edge and southwestern corner of Oktibbeha County were apparently sedimented in a fluctuating, shallow, coastal-marine environment. In places, numerous cut-and-fill sedimentation patterns resembling stream channel activity are apparent. Clay lenses 2 to 24 inches thick, alternating with thicker clay loam and sandy loam beds, are commonplace throughout the formation. Beds of clay-ball conglomerates, which have clay balls 1 to 3 centimeters in diameter, occur near the base of the formation. A study of sections of the Wilcox soils showed montmorillonite to be a major mineral constituent of the clay lenses, kaolinite being the more abundant clay mineral in the loamy beds and in the beds of clay-ball conglomerate.

Soils formed from Wilcox sediments have clay mineralogy resembling the particular beds from which they were derived. The Ruston soils and Maben soils probably formed from the respective sandy loam and clay loam beds and have high kaolinite and low montmorillonite clay mineralogy. The Boswell soils in the area likely formed from beds containing thick lenses of montmorillonite clay, and their resulting clay minerals are high in montmorillonite. The local flood plains containing Mantachie, Myatt, and Ochlockonee soils received sediments from each of the various Wilcox beds, and probably from the underlying Porter's Creek clay as well.

Chemical Properties of the Soils [8]

Only those chemical properties most characteristic of

TABLE 11.—*Chemical*

[Analyzed by the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural Experiment Station, Dashes

analysis of selected soils

indicate data not reported for calcareous soils because of the solubility effects of ammonium acetate on calcium carbonate]

Exchangeable cations [1]				Extractable acidity [2]	Extractable aluminum [3]	Sum of bases and hydrogen	Calcium magnesium ratio	Base saturation	
Calcium	Magnesium	Potassium	Sodium					By sum of cations	By ammonium acetate
Meq./100 gm. of soil	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*		*Percent*	*Percent*
9.00	2.64	0.11	0.12	5.60	0.80	17.47	3.4	68	62
5.36	2.43	.07	.46	7.70	8.10	16.02	2.2	52	39
----------	.17	.26	.01	0	0	----------	157.7	----------	----------
----------	.03	.12	.01	0	0	----------	392.0	----------	96
1.10	.04	.25	.02	3.09	.02	4.86	27.5	36	39
2.87	2.38	.49	.03	10.67	2.04	17.44	1.2	38	39
2.66	5.59	.49	.05	13.50	5.74	22.29	.5	39	35
1.59	1.50	.35	.09	16.69	8.91	20.22	1.1	17	14
1.30	6.06	.40	.11	17.82	10.25	25.69	.2	31	30
1.42	7.37	.42	.11	19.90	10.68	29.22	.2	32	31
25.40	1.64	.27	.30	10.00	0	37.61	15.5	73	75
24.00	.90	.30	.53	12.90	0	39.63	26.7	65	64
24.40	.50	.23	.68	13.50	0	39.31	48.8	66	66
27.20	.44	.35	.80	12.80	0	41.59	61.8	69	68
34.40	.70	.26	.96	5.70	0	42.02	49.1	86	87
21.60	.59	.19	.12	16.25	0	38.75	36.6	58	69
26.40	.04	.14	.13	10.70	0	37.41	660.0	71	77
26.40	.03	.23	.14	10.30	0	37.10	880.0	72	92
27.00	.03	.17	.18	10.70	0	38.08	900.0	72	95
28.60	.03	.25	.30	5.10	0	34.68	953.3	84	90
4.02	2.17	.21	.22	13.94	3.59	20.56	1.9	32	40
2.12	1.34	.21	.33	15.70	5.92	19.70	1.6	20	23
1.84	2.00	.33	.56	21.34	----------	26.07	.9	18	20
2.91	3.85	.58	1.13	27.07	16.10	35.54	.8	24	23
4.91	5.45	.40	1.33	18.22	4.80	30.31	.9	40	37
6.19	.68	.10	.07	4.40	0	11.44	9.0	62	63
2.40	.23	.20	.21	12.80	6.40	15.84	10.4	19	21
2.72	.35	.16	.30	16.16	8.30	19.69	7.8	18	21
3.98	.44	.23	.39	17.09	8.30	22.13	9.1	23	24
10.46	.20	.11	.07	13.72	----------	24.56	----------	44	42
36.80	.11	.35	.03	1.64	0	38.93	334.6	96	81
41.40	.07	.41	.07	4.81	0	46.76	591.4	90	112
42.40	.05	.29	.09	2.37	0	45.20	848.0	95	105
----------	.04	.23	.06	.05	0	----------	860.0	----------	80
----------	.05	.19	.06	0	0	----------	572.0	----------	91
4.91	.23	.73	.11	9.40	.87	15.38	21.4	39	49
4.81	.30	.15	.21	14.49	5.60	19.96	16.0	27	33
5.59	.15	.20	.36	16.35	6.56	22.66	37.3	28	31
10.95	.21	.23	.99	18.69	8.58	31.07	52.1	40	36
19.95	.25	.36	.15	18.97	5.73	39.68	79.8	52	49
30.20	.60	.26	1.89	7.27	----------	40.23	50.3	82	79
34.40	.04	.38	.06	1.88	0	36.76	860.0	95	108
32.60	.28	.43	.10	2.50	0	35.91	116.4	93	104
20.80	.17	.32	.21	6.77	0	28.27	122.4	76	76
23.80	.25	.39	.26	5.30	0	30.00	95.2	82	87
22.40	.20	.31	.31	4.20	0	27.42	112.0	85	97
4.92	2.02	.44	.21	10.25	0	17.84	2.4	42	55
10.75	6.50	.52	.42	12.79	.40	30.98	1.7	59	62
5.23	4.47	.41	.42	22.27	9.40	32.38	1.2	33	35
1.79	3.24	.33	.46	17.29	8.50	23.11	.5	25	29
1.60	.72	.07	.11	5.54	1.33	8.04	2.2	31	34
1.54	.28	.17	.12	9.50	1.84	11.61	5.5	18	25
.64	.73	.30	.14	9.48	2.95	11.29	.9	16	20
.18	2.07	.06	.24	10.45	4.54	13.00	.1	20	23

TABLE 11.—*Chemical*

Soil type	MAES–SGM 68 sample number	Horizon	Depth from surface	Reaction	Organic matter	Cation exchange capacity by ammonium acetate
			Inches	*pH*	*Percent*	*Meq./100 gm. of soil*
Marietta fine sandy loam	689	Ap	0–6	6.7	1.55	9.1
	690	B21	6–15	7.0	.38	10.0
	691	B22	15–26	6.9	.62	13.3
	692	B23	26–55	7.2	.32	11.8
Mathiston silt loam	625	Ap	0–6	5.2	1.15	9.7
	626	B21	6–14	4.7	.62	12.4
	627	B22g	14–22	4.7	.46	13.2
	628	B23g	22–39	4.7	.32	14.8
	629	B3g	39–52	4.5	.32	13.7
Ochlockonee loam	693	Ap	0–7	5.1	.95	6.3
	694	C1	7–20	4.9	.46	7.0
	695	C2	20–28	4.9	.32	7.0
	696	C3	28–36	4.9	.46	8.4
	697	C4	36–52	4.9	.25	9.9
Oktibbeha silty clay loam	583	Ap	0–4	6.4	4.15	25.0
	584	B21t	4–12	4.4	1.25	40.0

analysis of selected soils—Continued

Exchangeable cations [1]				Extractable acidity [2]	Extractable aluminum [3]	Sum of bases and hydrogen	Calcium magnesium ratio	Base saturation	
Calcium	Magnesium	Potassium	Sodium					By sum of cations	By ammonium acetate
Meq./100 gm. of soil	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*		*Percent*	*Percent*
9.60	.10	.08	.04	1.20	0	11.02	96.0	89	108
10.80	.07	.10	.11	.66	0	11.74	154.2	94	112
12.16	.30	.19	.15	.90	0	13.70	40.5	93	97
10.80	.47	.15	.08	.86	0	12.36	23.0	93	98
3.72	3.45	.39	.03	9.12	.30	16.80	1.1	45	78
2.27	3.70	.24	.04	12.87	3.00	19.12	.6	51	33
2.26	3.92	.24	.04	15.43	6.40	21.89	.6	30	49
1.92	4.18	.29	.05	14.82	8.80	21.26	.5	30	44
1.64	3.81	.31	.04	13.85	8.00	19.65	.4	30	42
1.72	.82	.25	.01	2.60	.22	5.40	2.1	52	45
1.20	1.30	.15	.01	4.00	.90	6.66	.9	40	38
.68	1.47	.20	.03	6.23	1.30	8.61	.5	28	34
.68	1.89	.14	.06	5.60	.84	8.37	.3	33	33
.60	2.27	.19	.09	7.70	2.00	10.85	.3	29	32
20.40	.73	.26	.04	8.24	0	29.68	28.0	72	86
15.00	.83	.36	.06	25.62	9.16	41.87	18.1	39	40
15.20	.29	.37	.08	28.20	12.41	44.13	54.3	36	35
18.20	.50	.32	.15	24.35	14.19	43.52	36.4	44	41
28.80	.83	.40	.19	16.71	4.87	46.93	34.7	64	61
----------	.21	.09	.04	2.63	0	----------	99.1	----------	----------
6.44	.20	.29	.06	3.81	0	10.60	32.2	65	75
1.92	.25	.11	.09	7.52	1.20	9.87	7.7	24	34
1.71	.27	.08	.09	7.52	3.20	9.67	6.3	22	31
1.16	.28	.04	.06	5.66	3.20	7.20	4.1	21	23
1.20	1.92	.19	.42	10.64	5.50	14.37	.6	27	34
3.28	2.71	.27	.02	6.90	0	13.18	1.2	48	49
1.02	2.47	.15	.08	13.10	4.80	16.82	.4	22	26
.40	2.49	.25	.17	16.50	7.10	19.81	.2	17	18
.26	2.16	.23	.24	15.80	6.10	18.69	.1	15	17
.72	3.05	.25	.39	16.90	7.00	21.31	.2	21	23
.31	.05	.04	0	3.27	.39	3.67	6.2	5	11
.24	.02	.02	0	2.44	.33	3.72	12.0	34	57
2.96	2.20	.26	0	4.10	.49	9.52	1.4	57	48
.36	.85	.12	0	3.81	.58	5.14	.4	26	31
.31	.33	.02	0	.78	0	1.44	.9	46	26
.58	1.15	.08	0	3.41	.23	5.30	.5	34	49
.34	1.84	.08	.01	6.03	2.97	8.29	.2	27	38
16.00	3.35	.38	.14	21.29	3.00	41.16	4.8	48	56
11.40	2.20	.09	.36	26.18	13.07	40.23	5.2	35	38
14.80	2.38	.13	.43	25.79	9.56	43.53	6.2	41	46
14.80	2.57	.86	.82	21.10	7.12	40.15	5.8	47	49
19.00	3.08	.23	1.11	20.81	9.80	44.23	6.2	53	55
26.60	4.02	.21	1.44	17.29	4.90	49.56	6.6	65	76
31.20	4.52	.17	1.78	15.24	1.50	52.91	6.9	72	78
34.30	4.55	.14	2.29	8.40	0	49.68	7.5	83	81
2.87	.03	(4)	0	3.83	.60	6.73	95.7	43	54
.80	.11	(4)	0	6.54	1.30	7.36	7.3	11	20
.74	.08	.10	0	11.03	2.70	11.95	9.3	8	16
.60	.03	.02	.01	6.52	3.20	7.17	20.0	9	12
.40	.13	.10	.01	8.49	2.80	9.12	17.8	7	9
21.40	.28	.23	0	.97	0	22.88	76.4	96	82
18.75	.07	.12	0	.10	0	19.04	267.9	99	81
15.70	.03	.10	0	.10	0	15.93	523.3	99	93
18.60	.03	.14	0	.10	0	18.87	620.0	99	116

TABLE 11.—*Chemical*

Soil type	MAES–SGM 68 sample number	Horizon	Depth from surface	Reaction	Organic matter	Cation exchange capacity by ammonium acetate
			Inches	*pH*	*Percent*	*Meq./100 gm. of soil*
Urbo silty clay loam	646	Ap	0–5	5. 3	1. 98	22. 0
	647	B21	5–12	4. 8	. 78	18. 0
	648	B22g	12–18	4. 6	. 46	20. 8
	649	B23g	18–55	4. 7	. 46	24. 5

[1] Extractable by 1*N* Ammonium Acetate (NH_4OAc) of pH 7. 0.
[2] Extractable by Barium Chloride—TEA.

Potassium, calcium, magnesium, and sodium were extracted from 25-gram soil samples with normal ammonium acetate buffered at pH 7.0 with ammonium hydroxide. Calcium, potassium, and sodium were then determined in the extract with a flame emission spectrophotometer. (Beckman DU Spectrophotometer.) Magnesium in the extract was determined by atomic absorption. The content of extractable cations is expressed in terms of milliequivalents per 100 grams of oven-dry (110 C.) soil.

The extractable hydrogen was determined by the barium chloride-triethanolamine method.

The aluminum was determined by potassium chloride extraction and titration with sodium hydroxide.

Calcium (Ca)	meq./100 grams x 400	=	pounds per acre
Magnesium (Mg)	meq./100 grams x 240	=	pounds per acre
Potassium (K)	meq./100 grams x 780	=	pounds per acre
Sodium (Na)	meq./100 grams x 460	=	pounds per acre
Hydrogen (H)	meq./100 grams x 20	=	pounds per acre
Aluminum (Al)	meq./100 grams x 180	=	pounds per acre

analysis of selected soils—Continued

Exchangeable cations [1]				Extractable acidity [2]	Extractable aluminum [3]	Sum of bases and hydrogen	Calcium magnesium ratio	Base saturation	
Calcium	Magnesium	Potassium	Sodium					By sum of cations	By ammonium acetate
Meq./100 gm. of soil	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*	*Meq./100 gm. of soil*		*Percent*	*Percent*
. 36	3. 95	. 14	. 01	22. 08	1. 61	26. 56	. 1	17	20
2. 46	2. 31	. 37	. 03	14. 50	7. 70	19. 67	1. 1	26	29
2. 36	2. 57	. 24	. 03	17. 30	9. 95	22. 40	. 9	23	25
1. 46	3. 65	. 29	. 06	22. 20	8. 00	27. 66	. 4	20	22

[3] Extractable by 1*N* Potassium Chloride.
[4] Trace.

to the west. Associated with each class of acidity are other major differences in chemical properties.

The soils of the Prairie to the east have high cation exchange capacities that arise from the abundant montmorillonite in their clays. Exchange capacities of the fine-textured Leeper, Catalpa, Brooksville, Houston, Sumter, and Binnsville soils range from 20 to 50 milliequivalents per 100 grams of soil. The percentage base saturation of these soils is typically high, often approaching 100 percent, and many of them contain free calcium carbonate. The Sumter and Binnsville soils are characteristically calcareous. As a general rule some free calcium carbonate is usually present when the soil pH exceeds 7.2. Quite often this carbonate exists in the soil as pea size or larger nodules that have been churned up from deeper layers as a result of the self mixing behavoir of these soils. A lot of the carbonate is brought to the soil surface by crayfish that prefer soils of Blackland Prairie and usually burrow into the underlying limy substratum.

erties of these soils, few acute potassium deficiencies have been observed in plants.

Because of their nonacid nature, soils of Blackland Prairie contain little or no exchangeable hydrogen and aluminum, and only small amounts of extractable acidity. Usually extractable acidity levels are equivalent to the differences between cation exchange capacities measured at pH 7, and those arrived at by the sum of bases plus extractable acidity.

The chemical properties of soils in central and western Oktibbeha County are quite variable because of the great variability in texture, mineralogy, and characteristics of parent materials. Soils like the Stough, Prentiss, Ruston, Ochlockonee, Mantachie, and Savannah have low to moderate cation exchange capacities. Most of these soils occur in the southern part and along the western edge of the county, although areas of Savannah soils appear throughout western Oktibbeha County. Cation-exchange capacities in soils like the Providence, Long-

lime requirements are so high that landowners find it economically difficult to lime them to recommended pH levels.

Additional Facts About the County

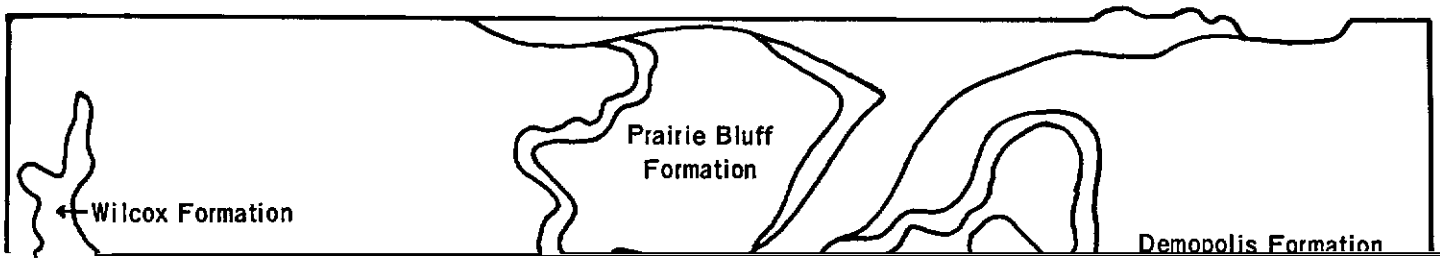
This section was prepared for those seeking additional information about the county. It discusses early history and growth, geology, farming, climate, and other subjects of general interest.

Oktibbeha County was created by an act of the State Legislature on December 23, 1833. The county was named Oktibbeha, which in the Choctaw language means "Ice in Water." The area was part of the territory held in common by the Choctaw Indians. In March, 1831, through the Treaty of Dancing Rabbit, which was approved by Congress, the land was acquired.

south to about 10 miles at the boundary with Clay County to the north. The Demopolis Chalk is predominantly medium gray, massively bedded chalk and marl consisting largely of calcite in the form of microscopic fossils and, in addition, montmorillonitic clay with subordinate amounts of sand and mica. In the regions underlain by relatively pure chalks with less clay, bald spots are common and the soils are shallow. The exposed thickness is probably not more than 50 feet in Oktibbeha County.

The Ripley Formation is a relatively thin unit of very fine-grained calcareous sand and medium gray calcareous clay. It is probably not more than 70 feet thick.

The Prairie Bluff Formation is made up of medium gray, massively bedded chalk, and locally thin beds of light brown calcareous sandstone. Small masses of dark greenish-gray phosphatic material and grains of glauconite and quartz occur in variable amounts in all horizons. The thickness probably does not exceed 70 feet.


Prairie Bluff
Formation
Wilcox Formation
Demopolis Formation

tends from West Point through Starkville and connects with Ackerman. There are nine truck lines operating over U.S. Highway No. 82 and State Routes 12 and 25.

Electric power is furnished by the Tennessee Valley Authority.

There is adequate water supply for all needs available everywhere, but the depth at which it is obtained ranges from 700 to 900 feet. There are public water systems

date of the last killing frost in the spring is March 25, and the average first date in fall is November 6. The average frost-free period is 226 days (*8*).

If the sky is clear and the air is calm, frost can form near the ground at night and adversely affect seeds in beds and young plants, even though the temperature registered on a thermometer in a shelter 5 feet above the ground is higher than 32°. On cold windy nights, the

79 percent when the temperature is 90° or higher, but it ranges from 50 to 79 percent for 26 percent of the time when the temperature is 90° or higher. The relative humidity in Oktibbeha County is less than 50 percent in about three-fourths of the hours that have a temperature of 90° or higher.

Records from 1875 to 1959 indicate that tropical storms and hurricanes have never caused winds of gale or hurricane force in Oktibbeha County, although heavy rains as a result of these storms have caused floods and have ruined unharvested crops. Records indicate that on the average there are two to four tornadoes about every 40 years in Oktibbeha County.

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Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

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

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

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

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

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

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

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

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

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

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

fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Genesis, soil. The manner in which a soil originates. Refers especially to the processes initiated by climate and organisms that are responsible for the development of the solum, or true soil, from the unconsolidated parent material, as conditioned by relief and age of landform.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

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

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

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

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

is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

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

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

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on relatively steep slopes and in swelling clays, where there is marked change in moisture content.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. Structureless soils are (1) *single grain* (each