SOIL SURVEY OF

Lauderdale County, Alabama

United States Department of Agriculture
Soil Conservation Service
In cooperation with
Alabama Department of Agriculture and Industries
and
Alabama Agricultural Experiment Station

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in the period 1963-73. Soil names and descriptions were approved in 1973. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1973. This survey was made cooperatively by the Soil Conservation Service, the Alabama Department of Agriculture and Industries, and the Alabama Agricultural Experiment Station. It is part of the technical assistance furnished to the Lauderdale County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

HOW TO USE THIS SOIL SURVEY

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

Locating Soils

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

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

Finding and Using Information

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

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those that have a moderate limitation can be colored yellow, and those that have a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the descriptions of the woodland suitability groups. In this survey the suitability and management of the soils for specific crops and pasture are discussed in the mapping unit descriptions.

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

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

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

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

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

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

Cover: Fescue and legume pasture on Dickson silt loam, 2 to 6 percent slopes; this is subclass IIe land. Dickson-Fullerton association in background.

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SOIL SURVEY OF LAUDERDALE COUNTY, ALABAMA

BY HOYT SHERARD, SOIL CONSERVATION SERVICE

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

LAUDERDALE COUNTY is in the northwestern corner of Alabama (fig. 1). It has a land area of 688 square miles, or 440,320 acres.

In 1970 the population of the county was 68,111. Florence, the county seat and largest town, had a population of 34,031. Rivers border the southern and western parts of the county. The western part of the county is part of the Coastal Plain, the northern part is on the Highland Rim, and areas along the southern boundary adjacent to the Tennessee River are in the limestone valleys.

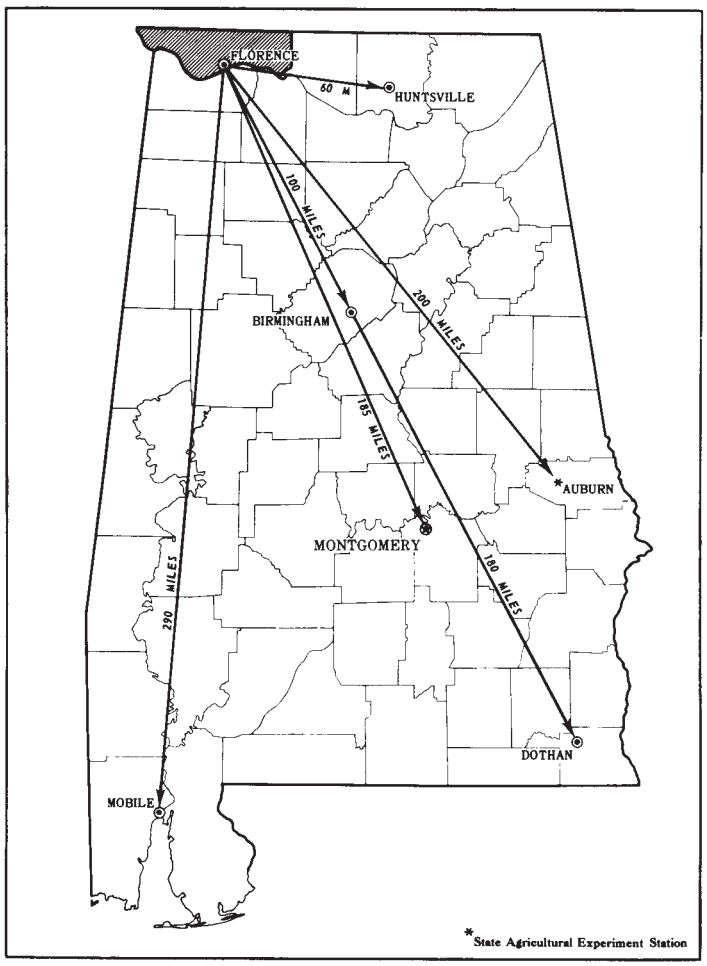

Figure 1.—Location of Lauderdale County in Alabama.

Many of the soils in the western part of the county and adjacent to the larger streams are not suited to row crops and pasture, because they are steep, stony, and susceptible to erosion. They are, however, suited to trees. Most of the soils on the Highland Rim and in the limestone valleys are suited to row crops and pasture.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Lauderdale County and where they are located. They went into the county knowing that they probably would find many soils they had already seen and perhaps some unfamiliar ones. 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 with others in nearby counties and in more distant places. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Decatur and Dickson, for example, are the names of two soil series. All the soils in the United States that have the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects the use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Dickson silt loam, 2 to 6 percent slopes, is one of several phases within the Dickson series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of

the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this survey was prepared from aerial photographs.

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

Some mapping units are made up of soils of different series or of different phases within one series. One such kind of mapping unit is shown on the soil map of Lauderdale County as an undifferentiated group. An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Saffell and Bodine soils, steep, is an example.

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

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that absorption fields for onsite disposal of sewage fail on a given kind of soil. They relate this to the slow permeability of the soil or its high water table. They see that streets, road pavements, and foundations for houses are cracked on a named kind of soil, and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. They then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Lauderdale County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

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

The soil associations in this survey have been grouped into two general kinds of landscapes for broad interpretative purposes. Each of the broad groups and its included soil associations are described in the following pages.

Dominantly Sloping to Steep Gravelly and Cherty Soils on Uplands

The soils in this group of associations are on hills in the western part of the county and are adjacent to the larger streams throughout the county. They are deep and well drained to excessively drained. They are highly dissected by narrow valleys and winding drainageways. They formed in material weathered from marine deposits and cherty limestone. In most areas bedrock is at a depth of 5 feet or more. These soils are used mainly for trees.

1. Saffell-Bodine-Smithdale association

Well-drained to excessively drained, moderately coarse textured and medium-textured soils

This association consists of sloping to steep soils on uplands capped with marine sediment of the Tuscaloosa Formation. This sediment ranges from nearly zero to more than 50 feet in depth and is underlain by cherty limestone of the Highland Rim. The uplands are highly dissected by many intermittent streams and a few permanent streams. The area is characterized by narrow, winding ridgetops, steep side slopes, and nearly level areas along drainageways. The gradient of the side slopes ranges from 10 to 35 percent. Most of the area is wooded. The association makes up most of the extreme western part of the county.

This association covers about 16 percent of the county. It is about 77 percent Saffell soils, 9 percent Bodine soils, 9 percent Smithdale soils, and 5 percent less extensive soils.

Saffell soils are on narrow ridgetops and steep side slopes. They have a surface layer of brown gravelly fine sandy loam. The subsoil is strong-brown to yellowish-red gravelly fine sandy clay loam and gravelly fine sandy loam. The underlying material is generally stratified gravelly, sandy, and silty marine sediment. Saffell soils are underlain at varying depths by cherty material similar to that of Bodine soils.

Bodine soils are mostly on steep side slopes. They have a surface layer of dark grayish-brown cherty silt loam. The

Figure 2.—**Second growth loblolly pine trees and hardwoods in the Saffell-Bodine-Smithdale association.**

subsoil is yellowish-brown and strong-brown cherty silt loam, silty clay loam, or clay.

Smithdale soils are on ridgetops and side slopes. They have a surface layer of brown or dark-brown fine sandy loam. The subsoil is yellowish-red and red, friable sandy clay loam.

Less extensive in this association are Dickson, Humphreys, Lobelville, and Lee soils. The Dickson soils are on broad upland ridgetops and high stream terraces. The Humphreys soils are on low stream terraces. Lobelville and Lee soils are on flood plains.

About 90 percent of this association is wooded. A small acreage on the ridgetops and along the drainageways is cultivated. The soils on the hillsides are not suited to cultivation, because of steep slope and a severe hazard of erosion.

Most farms in this association are 80 to 160 acres in size. Soybeans, corn, and cotton are the chief crops. A few farms have beef cattle herds. Farming is generally a part-time enterprise. The major soils of this association are well suited to trees (figs. 2, 3), range plants, and plants that provide food and cover for wildlife. Most of the western half of this association is under wildlife management supervision by the State of Alabama Department of Conservation and Natural Resources. Small food plots managed for wildlife are scattered throughout the area. The area has been stocked with deer and turkey, and hunting is controlled. A few large tracts of land in this association are owned by pulp and paper companies and by individuals. They are used for the production of pulpwood and saw timber.

2. *Bodine-Fullerton association*

Well-drained to excessively drained, medium-textured soils

This association consists mainly of sloping to steep soils on uplands that are dissected by many intermittent streams and a few permanent streams. The area is characterized by narrow, winding ridgetops, steep side slopes, and nearly level areas on the stream bottoms. The gradient of the side slopes ranges from 15 to 35 percent.

This association covers about 24 percent of the county. It is about 71 percent Bodine soils, 12 percent Fullerton soils, and 17 percent less extensive soils.

Bodine soils are on the strongly sloping to steep side slopes. They have a surface layer of dark grayish-brown cherty silt loam. The subsoil is yellowish-brown and strong-brown cherty silty clay loam to cherty clay.

Fullerton soils are generally on sloping to strongly sloping, narrow ridgetops and toe slopes. They have a surface layer of brown cherty silt loam. The subsoil is strong-brown and red cherty silty clay loam to cherty clay.

Less extensive in this association are Humphreys, Lee, Lobelville, and Pruitton soils. The Humphreys soils are on

Figure 3.—**White oaks and other hardwoods in the Saffell-Bodine-Smithdale association.**

stream terraces. Lee, Lobelville, and Pruitton soils are on stream flood plains.

About 70 percent of this association is wooded. A small acreage on ridgetops, low stream terraces, and flood plains is cultivated. The soils on the hillsides are not suited to cultivation, because of steep slope and the hazard of erosion.

Farming is generally a part-time enterprise. The major soils in this association are well suited to trees, range plants, and plants that provide food and cover for wildlife. Water for most livestock is provided by streams and springs and, on some farms, by ponds.

Dominantly Nearly Level to Strongly Sloping Cherty and Noncherty Soils on Uplands

The soils in this group of associations are mostly deep and have slopes of 2 to 10 percent. They formed in residuum weathered from cherty limestone, limestone, and an admixture of old valley fill material of similar origin. Some of the noncherty soils in the north-central and eastern parts of the county have a fragipan at a depth of about 20 to 30 inches. The soils in these associations have a wide range of suitability and respond to good management. Most of the farms in the county that grow row crops are in these areas.

3. Dewey-Decatur association

Well-drained, dominantly medium textured, noncherty soils

This association consists of broad limestone valley uplands that are dissected by shallow, channeled, intermittent streams and a few permanent streams.

This association covers about 20 percent of the county. It is about 53 percent Dewey soils, 26 percent Decatur soils, and 21 percent less extensive soils.

Dewey soils have a surface layer of reddish-brown silt loam or silty clay loam. The subsoil is red to dark-red friable silty clay loam, silty clay, or clay.

Decatur soils have a surface layer of dark reddish-brown silt loam or silty clay loam. The subsoil is dark-red or dark reddish-brown friable to firm silty clay loam to clay.

Less extensive in this association are Etowah, Fullerton, Grasmere, and Staser soils. The Etowah soils are on stream terraces. Fullerton soils are cherty and are on uplands. Grasmere soils are in depressions on uplands and on stream terraces.

Most of this association has been cleared and is used for crops and pasture. The areas are farmed intensively, and the soils are the most productive in the county. The response to lime and fertilizer is good.

The average size of the farms in this association is about 320 acres or larger. Some farmers, however, rent or lease other land and operate larger farms. Most of the farming is done with mechanized equipment. Cotton, soybeans, and corn are the major row crops. Beef cattle are common, and a few dairy herds are in areas of this association. Most of the streams are intermittent, and the water for livestock is provided by small farm ponds and wells.

4. Dickson-Fullerton association

Moderately well drained and well-drained, medium-textured, cherty soils

This association consists of broad areas of soils on uplands that are dissected by many intermittent streams and a few permanent streams. Some of the larger areas are in the Green Hill, Lexington, and Anderson communities.

This association covers about 40 percent of the county. It is about 59 percent Dickson soils, 24 percent Fullerton soils, and 17 percent less extensive soils.

Dickson soils have a surface layer of grayish-brown silt loam. The upper part of the subsoil is yellowish-brown friable silt loam, and the lower part has a dense, brittle fragipan at a depth of about 24 to 30 inches (fig. 4).

Fullerton soils have a surface layer of brown cherty silt loam. The subsoil is strong-brown and red cherty silty clay loam to cherty clay.

Less extensive in this association are Dewey, Guthrie, and Pruitton soils. The Dewey soils are well drained and are on uplands. Guthrie soils are nearly level and are on flats or in depressions on uplands. Pruitton soils are on flood plains.

About 85 percent of this association is cleared and used for crops and pasture. The areas are farmed intensively, and crops grow well under good management. Fertility is low, but the response to lime and fertilizer is good.

The average size of the farms in this association is about 80 acres. Some farmers, however, rent or lease other land and operate larger units. Almost all the farming is done with mechanized equipment. Cotton, soybeans, and corn are the chief row crops. Tall fescue (fig. 5), white clover, and lespedeza are the chief pasture plants. On many farms raising beef cattle is an important enterprise. A few dairy farms are in this association. Most of the streams are intermittent, and water for livestock is provided by small ponds and wells.

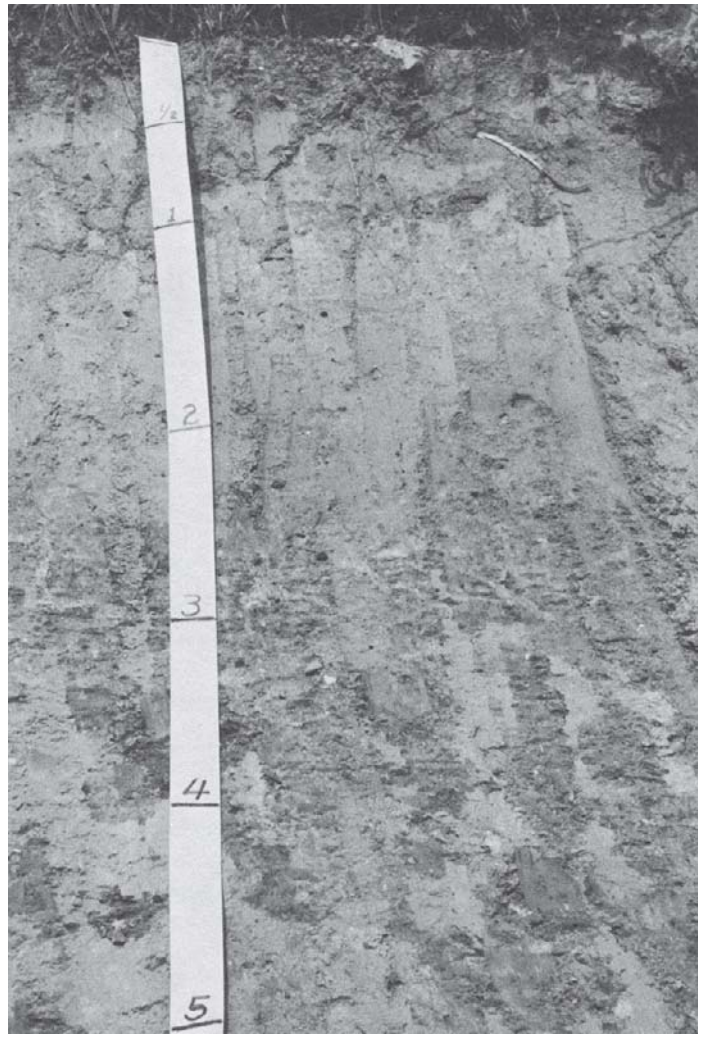

***Figure 4.*—Profile of a Dickson silt loam.**

Descriptions of the Soils

This section describes the soil series and mapping units in Lauderdale County. Each soil series is described in detail, and then, briefly, each mapping unit in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second is much more detailed; it is for those who need to make thorough and precise studies of soils. Color terms are for moist soil unless otherwise stated. The profile described in the series is representative for mapping units in that series. If the profile of a given mapping unit is different from the one described as representative of the series, such differences are either stated in the description of the mapping unit or are apparent in the name of the mapping unit.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Paleudults, 6 to 15 percent slopes, severely eroded, does not belong to a soil series but nevertheless is listed in alphabetical order along with the soil series.

Preceding the name of each mapping unit is a symbol. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland suitability group in which the mapping unit has been placed. The page for the description of each woodland suitability group or other interpretative group can be found by referring to the "Guide to Mapping Units" at the back of this survey.

Figure 5.—**Tall fescue pasture on Dickson silt loam, 2 to 6 percent slopes. An acre of this pasture provides grazing for one cow for about 180 days per year. Pond and homestead are in background.**

The approximate acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary at the end of this survey, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*7*). [1]

Armour Series

The Armour series consists of deep, well-drained, nearly level soils on low stream terraces. These soils formed in alluvium; the alluvium washed from soils that formed in material weathered from limestone, shale, and sandstone residuum.

In a representative profile the surface layer is dark-brown silt loam 8 inches thick. The upper part of the subsoil is dark-brown silty clay loam 9 inches thick. The lower part of the subsoil is strong-brown silty clay loam to a depth of 42 inches. The underlying material is brown cherty clay loam to a depth of 60 inches.

Infiltration and permeability are moderate. Available water capacity is high.

Most of the acreage of these soils has been cleared and is in crops and pasture. The native vegetation is mixed hardwoods.

Representative profile of Armour silt loam, which has slopes of 0 to 2 percent, in a cultivated field, about 1¼ miles west of Elgin, SW¼NE¼ sec. 30, T. 2 S., R. 8 W.:

Ap—0 to 8 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; common fine roots; few fine chert fragments; medium acid; clear, smooth boundary.

B1—8 to 17 inches, dark-brown (7.5YR 4/4) silty clay loam; weak, medium, subangular blocky structure; friable; common fine roots; few fine chert fragments; strongly acid; gradual, smooth boundary.

B2t—17 to 36 inches, strong-brown (7.5YR 5/8) silty clay loam; moderate, medium, subangular blocky structure; few thin, patchy clay films on faces of most peds; few fine roots; few fine chert fragments; strongly acid; gradual, smooth boundary.

B3t—36 to 42 inches, strong-brown (7.5YR 5/6) silty clay loam; common fine, distinct, light brownish-gray (10YR 6/2) and pale-

[1] Italic numbers in parentheses refer to Literature Cited, p. 45.

brown (10YR 6/3) mottles; moderate, medium, subangular blocky structure; friable; few thin, patchy clay films on faces of some peds; few chert fragments ¼ to ½ inch in diameter; strongly acid; clear, smooth boundary.

C—42 to 60 inches, brown (7.5YR 5/4) cherty clay loam; few fine, distinct, pale-brown (10YR 6/3) and gray (10YR 6/1) mottles; massive; about 35 percent chert fragments ½ inch to 2 inches in diameter; strongly acid.

The A horizon is very dark grayish brown to dark brown. The B1 horizon is brown, dark-brown, or dark yellowish-brown silt loam, loam, or silty clay loam. The B2 horizon is yellowish-brown, strong-brown, or yellowish-red silt loam or silty clay loam. The B3 horizon is yellowish-brown or strong-brown silty clay loam or silty clay mottled in shades of gray and brown. The C horizon is brown, strong-brown, or yellowish-red cherty clay loam or silty clay loam that is slightly mottled in shades of brown and gray. The A and B horizons are 2 to 5 percent fine chert fragments, and the C horizon is as much as 35 percent fine chert fragments. The profile is medium acid to strongly acid throughout.

Armour soils are associated with Humphreys, Lee, and Lobelville soils. They have no appreciable chert content, unlike Humphreys soils. Armour soils are better drained than Lee and Lobelville soils.

Ar—Armour silt loam. This soil has slopes of 0 to 2 percent. Included in mapping are small areas of Humphreys, Lee, and Lobelville soils and small areas of soils that have a surface layer of loam.

This Armour soil is well suited to all crops commonly grown in the county. Corn, cotton, soybeans, and small grain are the most commonly grown field crops. Tall fescue, bermudagrass, and white clover are the most commonly grown pasture crops. Response to lime and fertilizer is good. Row crops can be grown each year if crop residue is returned to the soil. Capability unit I-46; woodland suitability group 2o7.

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

Soil	Area	Extent
Armour silt loam	1,274	0.3
Bodine cherty silt loam, 10 to 35 percent slopes	72,963	16.7
Chenneby silt loam	2,224	.5
Choccolocco silt loam	1,040	.2
Decatur silt loam, 2 to 6 percent slopes	20,412	4.7
Decatur silty clay loam, 6 to 10 percent slopes, eroded	3,253	.8
Dewey silt loam, 2 to 6 percent slopes	35,763	8.2
Dewey silt loam, 6 to 10 percent slopes	6,333	1.4
Dewey silty clay loam, 6 to 10 percent slopes, eroded	5,787	1.3
Dickson silt loam, 0 to 2 percent slopes	7,964	1.7
Dickson silt loam, 2 to 6 percent slopes	82,668	18.9
Dickson silt loam, 6 to 10 percent slopes	16,160	3.7
Etowah silt loam, 2 to 8 percent slopes	3,900	.9
Fullerton cherty silt loam, 2 to 6 percent slopes	4,826	1.1
Fullerton cherty silt loam, 6 to 15 percent slopes	51,246	11.7
Grasmere silty clay loam	7,877	1.7
Guthrie silt loam	6,501	1.5
Humphreys cherty silt loam	888	.2
Lee cherty silt loam	11,895	2.7
Lobelville cherty silt loam	18,331	4.1
Paleudults, 6 to 15 percent slopes, severely eroded	642	.1
Pruitton silt loam	9,667	2.2
Saffell gravelly fine sandy loam, 6 to 10 percent slopes	10,629	2.4
Saffell and Bodine soils, steep	49,407	11.3
Smithdale fine sandy loam, 5 to 10 percent slopes	6,982	1.4
Staser silt loam	1,420	.3
Gravel pits, clay quarries, and other small areas	268	(1)
Total	440,320	100.0

[1] Less than 0.05 percent.

Bodine Series

The Bodine series consists of deep, well-drained or excessively drained, strongly sloping to steep soils on uplands. These soils formed in residuum weathered from cherty limestone.

In a representative profile the surface layer is dark grayish-brown cherty silt loam about 2 inches thick. The subsurface layer is brown cherty silt loam about 5 inches thick. The upper part of the subsoil is yellowish-brown cherty silt loam about 8 inches thick. The middle part of the subsoil is strong-brown cherty silty clay loam to a depth of about 50 inches. The lower part of the subsoil is chert beds that have interstices of brownish-yellow and strong-brown cherty silty clay loam to a depth of about 72 inches.

Infiltration and permeability are moderately rapid. Natural fertility and available water capacity are low.

About 90 percent of the acreage of these soils is wooded. The rest has been cleared and is mainly in pastures. Some areas are idle. The native vegetation is mixed hardwoods (fig. 6).

Representative profile of Bodine cherty silt loam, 10 to 35 percent slopes, in a wooded area about 4 miles northeast of St. Florian, SE¼NE¼ sec. 3, T. 2 S., R. 10 W.:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) cherty silt loam; weak, fine, granular structure; very friable; about 15 percent chert fragments, by volume; many fine roots; medium acid; abrupt, smooth boundary.

A2—2 to 7 inches, brown (10YR 4/3) cherty silt loam; weak, fine, granular structure; very friable; about 25 percent chert fragments, by volume; many fine roots; medium acid; clear, smooth boundary.

B1—7 to 15 inches, yellowish-brown (10YR 5/4) cherty silt loam; weak, fine, subangular blocky structure; friable; about 45 percent chert fragments, by volume; common medium and fine roots; medium acid; gradual, smooth boundary.

B21t—15 to 28 inches, strong-brown (7.5YR 5/8) cherty silty clay loam; moderate, medium and fine, subangular blocky structure; moderately friable to firm; thin, patchy clay films on faces of some peds; about 50 percent chert fragments, by volume; few medium roots, very strongly acid; gradual, smooth boundary.

B22t—28 to 50 inches, strong-brown (7.5YR 5/8) cherty silty clay loam; moderate, medium, subangular blocky structure; moderately friable to firm; thin, patchy clay films on faces of most peds; many clay films on chert fragments; about 75 percent chert fragments, by volume; few medium roots; strongly acid; abrupt, irregular boundary.

B3—50 to 72 inches, chert beds that have interstices filled with brownish-yellow (10YR 6/8) and strong-brown (7.5YR 5/8) cherty silty clay loam; weak, medium, subangular blocky structure; firm; thin, discontinuous clay films on some chert fragments; strongly acid.

The A horizon ranges from dark grayish brown or brown to yellowish brown. The B1 horizon ranges from yellowish brown to strong brown and from silt loam to loam. The B2 horizon is yellowish brown, strong brown, or yellowish red. It is silty clay loam, clay loam, or clay. The profile is 15 percent to more than 75 percent chert fragments, ½ inch to 1 foot in diameter. The profile ranges from medium acid to very strongly acid throughout.

Bodine soils are associated chiefly with Dickson, Fullerton, and Saffell soils. Bodine soils do not have the fragipan that is typical of Dickson soils. They are less clayey in the lower part of the profile and are more cherty throughout than Fullerton soils. They are more silty throughout the profile than Saffell soils. They are better drained than Lee soils.

Figure 6.—**Hardwoods in an area of Bodine cherty silt loam, 10 to 35 percent slopes.**

BoE—Bodine cherty silt loam, 10 to 35 percent slopes. This is the only Bodine soil mapped in the county. Included in mapping are small areas of Dickson, Fullerton, Lee, and Saffell soils and small areas of soils that have a surface layer of loam.

This Bodine soil is not suited to row crops. The less sloping areas are suited to such pasture crops as sericea and tall fescue. Response to lime and fertilizer is moderate. Fertilizer applied in split applications helps to reduce nutrient losses from leaching. Careful management of pasture helps to prevent loss of stands and weed infestation. Seedbeds are difficult to prepare because of steepness and chert content. Stands are often difficult to establish because of droughty conditions. Capability unit VIIs-43; woodland suitability group 3f8.

Chenneby Series

The Chenneby series consists of deep, somewhat poorly drained, nearly level soils on flood plains and low stream terraces. These soils formed in alluvium; the alluvium washed from soils that formed in material weathered from limestone that had some admixture of shale and sandstone residuum.

In a representative profile the upper part of the surface layer is dark grayish-brown silt loam 3 inches thick, and the lower part is brown silt loam 12 inches thick. The upper part of the subsoil is 7 inches of brown silt loam mottled with grayish brown. The middle part of the subsoil is dark grayish-brown silt loam mottled with gray to a depth of 34 inches. The lower part of the subsoil is gray silty clay loam mottled with brown and dark yellowish brown to a depth of 46 inches. The underlying material is mottled light-gray, brown, and reddish-brown silty clay loam to a depth of 65 inches.

Infiltration and permeability are moderate. Runoff is slow. Available water capacity is high. Overflow is a hazard.

About 80 percent of the acreage of these soils is in forest. The rest is cleared and is in crops and pasture. The native vegetation is mixed hardwoods and some pines.

Representative profile of Chenneby silt loam, which has slopes of 0 to 2 percent, in a wooded area about 1 mile southwest of Florence, NW¼SW¼ sec. 21, T. 3 S., R. 1 W.:

All—0 to 3 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

A12—3 to 15 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; common fine roots; strongly acid; clear, smooth boundary.

B1—15 to 22 inches, brown (10YR 4/3) silt loam; few, fine, distinct, grayish-brown (10YR 5/2) mottles; weak, medium, subangular blocky structure parting to weak, fine, granular; friable; few fine roots; strongly acid; gradual, smooth boundary.

B2—22 to 34 inches, dark grayish-brown (10YR 4/2) silt loam; common, fine, distinct, gray (10YR 5/1) mottles; weak, medium,

subangular blocky structure; friable; few fine mica flakes; strongly acid; gradual, smooth boundary.

B3—34 to 46 inches, gray (10YR 5/1) silty clay loam; many, fine, distinct, brown (10YR 5/3) and dark yellowish-brown (10YR 4/4) mottles; massive; firm; few fine mica flakes; few dark-brown concretions; strongly acid; gradual, smooth boundary.

Cg—46 to 65 inches, mottled light-gray (10YR 6/1), brown (10YR 5/3), and reddish-brown (5YR 4/4) silty clay loam; massive; firm; few fine mica flakes; few dark-brown concretions; strongly acid.

The A horizon is dark grayish brown, brown, or dark brown. The B1 horizon is light yellowish brown, brown, or pale brown. The B2 and B3 horizons are silt loam or silty clay loam. The Cg horizon is gray or light-gray loam or silty clay loam mottled in shades of brown. The profile ranges from medium acid to very strongly acid throughout.

Chenneby soils are associated with Choccolocco and Staser soils. Chenneby soils are more poorly drained than the adjacent, higher lying Choccolocco and Staser soils.

Ch—Chenneby silt loam. This soil has slopes of 0 to 2 percent. Included in mapping are small areas of Choccolocco and Staser soils and small areas of soils that have a surface layer of loam.

This Chenneby soil is suited to corn, soybeans, grain sorghum, tall fescue, and white clover. Response to lime and fertilizer is moderate. Row crops can be grown each year if a good drainage system is installed and crop residue is returned to the soil. Surface field ditches or underground drainage systems are needed to reduce wetness, but it is extremely difficult to prevent overflow in winter and spring. This soil can be tilled over a wide range of soil moisture. Wetness often restricts grazing during late winter and early spring. Capability unit IIIw-42; woodland suitability group 1w8.

Choccolocco Series

The Choccolocco series consists of deep, well-drained, nearly level soils on low stream terraces. These soils formed in alluvium; the alluvium washed chiefly from soils that formed in material weathered from limestone that had some admixture of shale and sandstone residuum.

In a representative profile the surface layer is brown silt loam 6 inches thick. The upper part of the subsoil is brown silt loam 7 inches thick. The middle part of the subsoil is silty clay loam to a depth of 40 inches. The lower part of the subsoil and the underlying material are dark yellowish-brown loam to a depth of 90 inches.

Infiltration and permeability are moderate. Runoff is moderately slow. Occasional flooding is a hazard. Available water capacity is moderate to high.

Almost all the acreage of these soils is cleared and is in crops and pasture. A few small areas are idle. The native vegetation is mixed hardwoods and pines.

Representative profile of Choccolocco silt loam, which has slopes of 0 to 2 percent, in a cultivated field, about 700 feet south of new sewage plant in Florence, 50 feet east of road, NW¼NE¼ sec. 21, T. 3 S., R. 11 W.:

Ap—0 to 6 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; many fine roots; medium acid; clear, smooth boundary.

B1—6 to 13 inches, brown (10YR 4/3) silt loam; weak, medium, subangular blocky structure parting to weak, fine, granular; friable; common fine roots; medium acid; clear, smooth boundary.

B21t—13 to 40 inches, dark yellowish-brown (10YR 4/4) silty clay loam; weak, medium, subangular blocky structure; friable; thin, discontinuous clay films on faces of most peds; few fine roots; common to many worm casts; common fine mica flakes; common fine manganese concretions; strongly acid; gradual, smooth boundary.

B22t—40 to 59 inches, dark yellowish-brown (10YR 4/4) loam; weak, medium, subangular blocky structure; friable; thin, discontinuous clay films on faces of most peds; clay flow in pores; many fine mica flakes; strongly acid; gradual, smooth boundary.

C—59 to 90 inches, dark yellowish-brown (10YR 4/4) loam; weak, medium, subangular structure to massive; friable; many fine mica flakes; strongly acid.

The A horizon is brown or dark grayish brown. The B1 horizon is brown, dark yellowish-brown, or yellowish-brown silt loam or loam. The B2 and C horizons are dark yellowish-brown, dark-brown, or yellowish-brown silty clay loam or loam. The C horizon is fine sandy loam in some places. The profile is medium acid to strongly acid throughout.

Choccolocco soils are associated with Chenneby and Staser soils. Choccolocco soils are better drained than Chenneby soils and are more silty than Staser soils.

Co—Choccolocco silt loam. This soil has slopes of 0 to 2 percent. Included in mapping are small areas of Chenneby and Staser soils and small areas of soils that have a surface layer of loam.

This Choccolocco soil is well suited to all crops commonly grown in the county. Corn, cotton, soybeans, and small grain are the most commonly grown field crops. Tall fescue, bermudagrass, and white clover are the most common pasture crops. Response to lime and fertilizer is good. Row crops can be grown each year if crop residue is returned to the soil. Capability unit I-46; woodland suitability group 2o7.

Decatur Series

The Decatur series consists of deep, well-drained, gently sloping to sloping soils on uplands. Some areas have karst topography. These soils formed in residuum weathered from limestone and an admixture of old valley fill material of similar origin.

In a representative profile the surface layer is dark reddish-brown silt loam about 7 inches thick. The upper part of the subsoil is dark reddish-brown silty clay loam 6 inches thick. The middle part of the subsoil is dark-red clay to a depth of 38 inches. The lower part of the subsoil is dark reddish-brown clay to a depth of 72 inches.

Infiltration and permeability are moderate. Available water capacity is moderate to high.

Almost all the acreage of these soils has been cleared and is in crops and pasture. The native vegetation is mixed hardwoods.

Representative profile of Decatur silt loam, 2 to 6 percent slopes, in an idle field, 2¾ miles south and ¾ mile east of Oakland on the south side of road cut, NE¼NE¼ sec. 15, T. 3 S., R. 12 W.:

Ap—0 to 7 inches, dark reddish-brown (5YR 3/2) silt loam; weak, fine, granular structure; friable; common fine roots; medium acid; gradual, smooth boundary.

B1—7 to 13 inches, dark reddish-brown (2.5YR 3/4) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; thin, patchy clay films on faces of most peds; few fine roots; few dark-brown concretions; medium acid; gradual, smooth boundary.

B21t—13 to 38 inches, dark-red (2.5YR 3/6) clay; moderate, medium and coarse, subangular blocky structure; firm, sticky, plastic; thin, continuous clay films on faces of most peds; few fine pores lined with clay; few fine roots; few dark-brown concretions; strongly acid; gradual, smooth boundary.

B22t—38 to 72 inches, dark reddish-brown (2.5YR 3/4) clay; moderate, medium and coarse, subangular blocky structure; firm,

sticky, plastic; thin, nearly continuous clay films on faces of most peds; few fine cherty fragments; few dark-brown concretions; strongly acid.

The A horizon is silt loam or silty clay loam. The Ap horizon is dark reddish brown to dark red. It is silty clay loam or silty clay. The B2t horizon ranges from dark reddish brown or dark red to dusky red. It is more than 60 inches thick. The B2t horizon is generally clay, but in places it is silty clay. The B22t and B23t horizons have few to common chert fragments, ½ inch to 2 inches in diameter. The profile is medium acid or strongly acid in the Ap and B1 horizons and strongly acid or very strongly acid in the B2t horizon.

Decatur soils are associated with Dewey, Fullerton, and Grasmere soils. They have darker red Ap and B1 horizons than Dewey soils. They have a darker red Bt horizon than Fullerton soils. They do not have the chert content of Fullerton soils or the buried A horizon that is typical of Grasmere soils.

DaB—Decatur silt loam, 2 to 6 percent slopes. This soil has the profile described as representative of the series. Included in mapping are small areas of Dewey, Fullerton, and Grasmere soils. Rills and shallow gullies are in some areas.

This Decatur soil is well suited to all crops commonly grown in the county. Cotton (fig. 7), corn, soybeans, and small grain are the most commonly grown field crops. Tall fescue, white clover, bermudagrass, annual summer grasses, and annual winter legumes are commonly grown pasture crops. Response to lime and fertilizer is good. The use of terraces, contour farming, and grassed waterways helps to reduce erosion. Minimum tilling and stripcropping are the best management practices for karst areas that are not suited to terraces. Crop residue should be left on the surface after harvest. It should be worked into the soil during preparation of a seedbed for the next crop. A cropping system that includes a close-growing crop at least 1 year out of 3 is needed. This soil can be tilled over a wide range of soil moisture. Capability unit IIe-41; woodland suitability group 3o7.

Figure 7.—**Cotton in an area of Decatur silt loam, 2 to 6 percent slopes.**

DcC2—Decatur silty clay loam, 6 to 10 percent slopes, eroded. This soil has a profile similar to the one described as representative of the series, but it has a surface layer of silty clay loam.

Included in mapping are small areas of Dewey and Fullerton soils and small areas of soils that have a surface layer of silty clay or clay. Rills and shallow gullies are in some areas.

This Decatur soil is suited to all crops commonly grown in the county. Cotton, soybeans, and small grain are the most commonly grown field crops. Tall fescue, white clover, and sericea are commonly grown pasture crops. Response to lime and fertilizer is good. The use of terraces, contour farming, and grassed waterways helps to reduce erosion. Minimum tilling and stripcropping are good management practices on fields that are unsuited to terraces. Crop residue should be left on the surface after harvest. It should be worked into the soil during preparation of a seedbed for the next crop. A cropping system that includes close-growing sod crops about 3 years out of 4 is needed. This soil can be tilled only over a narrow range of soil moisture. Equipment is difficult to operate in the more sloping areas. Capability unit IVe-411; woodland suitability group 4c3e.

Dewey Series

The Dewey series consists of deep, well-drained, gently sloping to sloping soils on uplands. These soils formed in residuum weathered from limestone and, in places, an admixture of old alluvium of similar origin.

In a representative profile the surface layer is reddish-brown silt loam 5 inches thick. The upper part of the subsoil is yellowish-red silty clay loam 7 inches thick. The middle part of the subsoil is dark-red silty clay to a depth of 34 inches. The lower part of the subsoil is dark-red clay to a depth of 70 inches.

Infiltration and permeability are moderate. Available water capacity is moderate to high.

Almost all the acreage of these soils has been cleared and is in crops and pasture. The native vegetation is mixed hardwoods.

Representative profile of Dewey silt loam, 2 to 6 percent slopes, in a cultivated field, 1 mile north of Jacksonburg, NE¼SW¼ sec. 2, T. 2 S., R. 11 W.:

Ap—0 to 5 inches, reddish-brown (5YR 4/4) silt loam; weak, fine, granular structure; friable; common fine roots; medium acid; clear, smooth boundary.

B1—5 to 12 inches, yellowish-red (5YR 4/8) silty clay loam; weak, medium, subangular blocky structure; friable; common fine roots; strongly acid; gradual, smooth boundary.

B21t—12 to 34 inches, dark-red (2.5YR 3/6) silty clay; moderate, medium, angular and subangular blocky structure; firm; thin, continuous clay films on faces of most peds; few fine roots; few,

fine, dark-brown concretions; strongly acid, gradual, smooth boundary.

B22t—34 to 50 inches, dark-red (2.5YR 3/6) clay; few, fine, faint, light reddish-brown (5YR 6/4) mottles; moderate, medium, angular and subangular blocky structure; firm; thin, continuous clay films on faces of most peds; few fine cherty fragments; few dark-brown concretions; strongly acid; gradual, smooth boundary.

B23t—50 to 70 inches, dark-red (10YR 3/6) clay; moderate, medium, angular and subangular blocky structure; firm; thin, continuous clay films on faces of most peds; few fine cherty fragments; strongly acid.

The A horizon is reddish-brown or dark reddish-brown silt loam or silty clay loam. The B1 horizon is yellowish-red, red, or dark-red silty clay loam or silty clay. The B2t horizon is red or dark-red clay or silty clay. It is more than 50 inches thick. The B22t and B23t horizons have few to common cherty fragments, ¼ inch to 2 inches in diameter, in some profiles. The profile is medium acid or strongly acid in the Ap horizon and is strongly acid in the B1 and B2t horizons.

Dewey soils are associated with Decatur, Fullerton, and Grasmere soils. They are less red throughout the Ap and B1 horizons than Decatur soils. They contain less chert than Fullerton soils. They do not have a buried A horizon that is typical of Grasmere soils.

DeB—Dewey silt loam, 2 to 6 percent slopes. This soil has the profile described as representative of the series. Included in mapping are small areas of Decatur, Fullerton, and Grasmere soils. Rills and shallow gullies are in some areas.

This Dewey soil is well suited to all crops commonly grown in the county. Corn, cotton, soybeans, small grain, tall fescue, bermudagrass, white clover, and winter annual legumes are the commonly grown field and pasture crops. Response to lime and fertilizer is good. The use of minimum tillage, terraces, contour farming, grassed waterways, and stripcropping helps to reduce erosion. Crop residue should be left on the surface after harvest and worked into the soil during preparation of a seedbed for the next crop. A cropping system that includes close-growing crops at least 1 year out of 3 is needed. This soil can be tilled over a wide range of soil moisture. Capability unit IIe-41; woodland suitability group 3o7.

DeC—Dewey silt loam, 6 to 10 percent slopes. This soil has a profile similar to the one described as representative of the series, but the surface layer is thicker. Included in mapping are small areas of Decatur and Fullerton soils. Rills and shallow gullies are in some areas.

This Dewey soil is suited to all crops commonly grown in the county. Cotton, corn, soybeans, and small grain are the most commonly grown field crops. Tall fescue, bermudagrass, sericea, annual lespedeza, and white clover are commonly grown pasture crops. Response to lime and fertilizer is good. The use of minimum tillage, stripcropping, contour farming, grassed waterways, and terraces helps to reduce erosion. Crop residue should be chopped and left on the surface after harvest. A cropping system that includes close-growing sod crops at least 2 years out of 3 is needed. This soil can be tilled over a fairly wide range of soil moisture. Equipment is difficult to operate in the more sloping areas. Capability unit IIIe-41; woodland suitability group 3o7.

DfC2—Dewey silty clay loam, 6 to 10 percent slopes, eroded. This soil has a profile similar to the one described as representative of the series, but it has a surface layer of silty clay loam. Included in mapping are small areas of Decatur and Fullerton soils and small areas of soils that have a surface layer of silty clay or clay. Rills and shallow gullies are in some areas.

This Dewey soil is suited to all crops commonly grown in the county. Cotton, small grain, and soybeans are commonly grown field crops. Tall fescue, bermudagrass, serica, annual lespedeza, and white clover are commonly grown pasture crops. Response to lime and fertilizer is good. The use of minimum tillage, stripcropping, contour farming, grassed waterways, and terraces helps to reduce erosion. Crop residue should be chopped and left on the surface after harvest. A cropping system that includes close-growing sod crops at least 3 years out of 4 is needed. Crop stands are difficult to establish during dry periods. This soil can be tilled only over a narrow range of soil moisture. Equipment is difficult to operate in the more sloping areas. Capability unit IVe-411; woodland suitability group 4c3e.

Dickson Series

The Dickson series consists of deep, moderately well drained, nearly level to sloping soils on uplands and high stream terraces. These soils have a fragipan in the lower part of the subsoil. They formed in residuum weathered from cherty limestone.

In a representative profile the surface and subsurface layers are dark grayish-brown and grayish-brown silt loam about 7 inches thick. The upper part of the subsoil is yellowish-brown silt loam 18 inches thick. The fragipan is pale-brown silt loam mottled with grayish brown to a depth of 32 inches and yellowish-brown silty clay loam mottled with brown and yellowish red to a depth of 44 inches. The lower part of the subsoil is dark-red silty clay mottled with grayish brown and yellowish brown. It extends to a depth of 72 inches.

Infiltration is moderate. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is high. A perched water table is above the fragipan for short periods following long rains.

About 75 percent of the acreage of these soils has been cleared and is in crops and pasture. The native vegetation was mixed hardwoods.

Representative profile of Dickson silt loam, 2 to 6 percent slopes, in a wooded area, about 0.9 mile south of the Tennessee State line on the west side of U.S. Highway 43, SE¼SE¼ sec. 6, T. 1 S., R. 8 W.:

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

A2—1 to 7 inches, grayish-brown (10YR 5/2) silt loam; moderate, medium and fine, granular structure; friable; many roots; strongly acid; clear, smooth boundary.

B1—7 to 11 inches, yellowish-brown (10YR 5/4) silt loam; moderate, fine and medium, subangular blocky structure; friable; common roots; few chert fragments ¼ to 1 inch in diameter; strongly acid; gradual, smooth boundary.

B2—11 to 25 inches, yellowish-brown (10YR 5/6) silt loam; moderate, fine and medium, subangular blocky structure; friable; few roots; few chert fragments ¼ to 1 inch in diameter; strongly acid; clear, smooth boundary.

A2'x—25 to 32 inches, pale-brown (10YR 6/3) silt loam; common, fine, distinct, grayish-brown (10YR 5/2) mottles; dark grayish-brown (10YR 4/2) coatings on faces of some peds; moderate, fine and medium, subangular blocky structure and some moderate, medium, platy structure; friable; slightly brittle; strongly acid; gradual, smooth boundary.

B'x—32 to 44 inches, yellowish-brown (10YR 5/4) silty clay loam; common, fine and medium, distinct, brown (10YR 4/3) and yellowish-red (5YR 4/6) mottles; moderate, medium, platy structure parting to moderate, medium and fine, subangular blocky; brittle and firm in more than 60 percent of the matrix; few veins and pockets of friable, gray (10YR 5/1) silty clay loam about ¼ to ½ inch wide; thin, patchy clay films on faces of most peds; few chert fragments ¼ to 1 inch in diameter; strongly acid; gradual, smooth boundary.

IIB'2t—44 to 72 inches, dark-red (2.5YR 3/6) silty clay; many fine and medium distinct, grayish-brown (10YR 5/2) and yellowish-brown (10YR 5/4) mottles; moderate, medium, subangular blocky structure; firm; thin, patchy clay films on faces of most peds; chert fragments as much as 2 inches in diameter make up 5 to 10 percent of the mass; strongly acid.

The A horizon is dark grayish brown, grayish brown, or brown. The B1 and B2 horizons are yellowish-brown to olive-brown silt loam or silty clay loam. The fragipan is at a depth of about 24 to 30 inches. The B'x horizon is mottled in shades of brown, gray, and red. It is silt loam or silty clay loam. The IIB horizon is red or dark-red silty clay or clay mottled in shades of brown or gray and has few to common chert fragments. The profile is strongly acid to very strongly acid throughout.

Dickson soils are associated with Dewey and Fullerton soils, neither of which has a fragipan. Dickson soils are more poorly drained than Dewey and Fullerton soils.

DoA—Dickson silt loam, 0 to 2 percent slopes. This soil has a profile similar to the one described as representative of the series, but the surface layer is thicker and the fragipan is mottled with brown, yellow, and gray. Included in mapping are small areas of Dewey and Fullerton soils. Also included are small areas of soils that have a surface layer of loam.

This Dickson soil is suited to all crops commonly grown in the county, but it is better suited to drought-tolerant crops than to others. Cotton, corn, soybeans, small grain, tall fescue, and legumes are commonly grown crops. Response to lime and fertilizer is good. Cultivated crops can be grown each year if crop residue is returned to the soil. Surface field ditches are needed in some areas to reduce ponding of surface water. This soil can be tilled over a wide range of soil moisture, but tilling is generally delayed in spring because of the perched water table above the fragipan. Capability unit IIw-49; woodland suitability group 3o7.

DoB—Dickson silt loam, 2 to 6 percent slopes. This soil has the profile described as representative of the series. Included in mapping are small areas of Dewey and Fullerton soils and small areas of soils that have a surface layer of loam.

This Dickson soil is suited to all crops commonly grown in the county, but it is better suited to drought-tolerant crops than to others. Cotton, corn, soybeans, and small grain are the commonly grown field crops (fig. 8). Response to lime and fertilizer is good. If this soil is used for crops, good management practices are needed. Contour farming, grassed waterways, stripcropping, terraces, and minimum tillage help to reduce erosion. A cropping system that includes close-growing crops about 1 year out of 3 is needed. Returning crop residue to the soil helps to maintain organic-matter content. Capability unit IIe-49; woodland suitability group 3o7.

DoC—Dickson silt loam, 6 to 10 percent slopes. This soil has a profile similar to the one described as representative of the series, but the surface layer is thicker and the fragipan is about 3 inches deeper in the subsoil. Included in mapping are small areas of Dewey and Fullerton soils. Also included are small areas of soils that have a surface layer of loam.

Figure 8.—**Soybeans in an area of Dickson silt loam, 2 to 6 percent slopes.**

This Dickson soil is better suited to drought-tolerant sod crops than to others. Row crops can be grown about 1 year out of 3 if good management practices are used. Commonly grown field crops are cotton, corn, soybeans, and small grain. If this soil is used for row crops, the hazard of erosion is severe. Rills and shallow gullies are few to common following heavy rains on freshly plowed areas. The use of contour farming, grassed waterways, stripcropping, and minimum tillage helps to reduce erosion. Capability unit IIIe-49; woodland suitability group 3o7.

Etowah Series

The Etowah series consists of deep, well-drained, gently sloping to sloping soils on stream terraces and foot slopes. These soils formed in alluvium that is commonly underlain by residuum weathered from limestone.

In a representative profile the surface layer is dark-brown silt loam 7 inches thick. The upper part of the subsoil is strong-brown silty clay loam 6 inches thick. The middle part of the subsoil is yellowish-red silty clay loam to a depth of 28 inches. The lower part of the subsoil is yellowish-red silty clay loam mottled with red and pale brown. It extends to a depth of 90 inches.

Infiltration and permeability are moderate. Available water capacity is high.

Most of the acreage of this soil has been cleared and is in row crops or pasture. The native vegetation is mixed hardwoods and pines.

Representative profile of Etowah silt loam, 2 to 8 percent slopes, in a pasture, 1⅛ miles southeast of Natchez Trace Tennessee River Bridge and about 200 feet north of the Tennessee River bank, SW¼SW¼ sec. 4, T. 3 S., R. 13 W.:

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

B1—7 to 13 inches, strong-brown (7.5YR 5/6) silty clay loam; moderate, medium, granular structure; friable; common fine roots; few fine pebbles; strongly acid; gradual, smooth boundary.

B21t—13 to 28 inches, yellowish-red (5YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; friable; few fine roots; few fine pebbles; thin, patchy clay films on faces of some peds; few, fine, dark-brown concretions; strongly acid; gradual, smooth boundary.

B22t—28 to 45 inches, yellowish-red (5YR 5/8) silty clay loam; common, medium, distinct, red (2.5YR 5/6) and pale-brown (10YR 6/3) mottles; moderate, medium, subangular blocky structure; friable; thin, discontinuous clay films on faces of most peds; few fine pebbles; common, fine, dark-brown concretions; very strongly acid; gradual, smooth boundary.

B23t—45 to 90 inches, yellowish-red (5YR 5/8) silty clay loam; few, fine, faint, pale-brown (10YR 6/3) mottles; moderate, medium, subangular blocky structure; firm; thin, discontinuous clay films on faces of most peds; few small pebbles; common, fine, dark-brown concretions; very strongly acid.

The Ap horizon is dark yellowish brown to dark brown. The B1 horizon is strong-brown to dark-brown silt loam, loam, or silty clay loam. The B2t horizon is yellowish red to red. It ranges from silty clay loam to clay loam and is commonly mottled in shades of red and pale brown in the lower part. The profile is strongly acid or very strongly acid throughout.

Etowah soils are associated with Staser soils. Etowah soils have a finer textured B horizon than the Staser soils.

EtB—Etowah silt loam, 2 to 8 percent slopes. This is the only Etowah soil mapped in the county. Included in mapping are small areas of adjacent Staser soils and small areas of soils that have a surface layer of loam.

This Etowah soil is suited to all crops commonly grown in the county. Cotton, corn, soybeans, small grain, tall fescue, bermudagrass, white clover, and annual clovers are commonly grown. If this soil is used for row crops, such good management practices as contour farming, terraces, grassed waterways, minimum tillage, and stripcropping are needed to help to control erosion. A cropping system that includes close-growing crops at least 1 year out of 3 is needed. Returning crop residue to the soil helps to maintain organic-matter content and good tilth. Capability unit IIe-42; woodland suitability group 2o7.

Fullerton Series

The Fullerton series consists of deep, well-drained, gently sloping to strongly sloping, cherty soils on uplands. These soils formed in residuum weathered from cherty, limestone.

In a representative profile the surface layer is brown cherty silt loam 8 inches thick. The upper part of the subsoil is strong-brown cherty silty clay loam 7 inches thick. The middle part of the subsoil is yellowish-red cherty silty clay to a depth of 35 inches and red cherty clay between the depths of 35 and 47 inches. The lower part of the subsoil is red cherty clay mottled with strong brown and light brownish gray to a depth of 72 inches.

Infiltration and permeability are moderate. Available water capacity is moderate.

Most of the acreage of these soils, which have slopes of 2 to 10 percent, is cleared and is in row crops or pasture. Some eroded areas have reverted to pine forest, and others are idle. The native vegetation is mixed hardwoods.

Representative profile of Fullerton cherty silt loam, 6 to 15 percent slopes, in an idle area, about 2.5 miles southwest of Green Hill, NE¼NW¼ sec. 23, T. 1 S., R. 10 W.:

Ap—0 to 8 inches, brown (10YR 4/3) cherty silt loam; weak, fine, granular structure; very friable; many roots; about 15 percent cherty fragments, by volume; strongly acid; clear, smooth boundary.

B1—8 to 15 inches, strong-brown (7.5YR 5/6) cherty silty clay loam; weak, fine and medium, subangular structure; friable; common roots; about 15 percent chert fragments, by volume; strongly acid; gradual, smooth boundary.

B21t—15 to 35 inches, yellowish-red (5YR 5/8) cherty silty clay; moderate, medium, subangular blocky structure; firm; thin, patchy clay films on faces of most peds; few fine roots; about 15 percent chert fragments, by volume; strongly acid; gradual, smooth boundary.

B22t—35 to 47 inches, red (2.5YR 4/8) cherty clay; moderate, medium, subangular blocky structure; firm; thin, patchy clay films on faces of most peds; about 25 percent chert fragments, by volume; strongly acid; gradual, smooth boundary.

B3t—47 to 72 inches, red (2.5YR 4/8) cherty clay; common, medium, distinct, strong-brown (7.5YR 5/8) and light brownish-gray (10YR 6/2) mottles; moderate, medium, subangular blocky structure; firm; thin, patchy clay films on faces of most peds; about 30 percent chert fragments, by volume; strongly acid.

The A horizon is dark grayish-brown or brown cherty silt loam. The B1 horizon is yellowish-red or strong-brown cherty silt loam or cherty silty clay loam. The B2t horizon is yellowish-red or red cherty silty clay or cherty clay. The B3t horizon generally is mottled in shades of brown and gray, but in some profiles it has no mottles. The profile is 15 to 35 percent chert fragments, by volume. It is strongly acid to very strongly acid throughout.

Fullerton soils are associated with Dewey and Dickson soils. They have more chert fragments than Dewey soils. Fullerton soils do not have the fragipan that is typical of Dickson soils.

FaB—Fullerton cherty silt loam, 2 to 6 percent slopes. This soil has a profile similar to the one described as representative of the series, but the surface layer is about 3 inches thinner and the upper part of the subsoil is less clayey. Included in mapping are small areas of soils south of Killen that have coarse cherty fragments on the surface and in the profile and small areas of soils that have a surface layer of silty clay loam.

This Fullerton soil is well suited to all crops commonly grown in the county. Cotton, corn, soybeans, small grain, tall fescue, bermudagrass, white clover, and winter annual legumes are commonly grown. Response to lime and fertilizer is good. If this soil is used for row crops, good management practices are needed to help to control erosion. Contour farming, terraces, grassed waterways, minimum tillage, and stripcropping are good management practices. A cropping system that includes close-growing crops about 1 year out of 3 is needed. Returning crop residue to the soil helps to maintain organic-matter content. This soil can be tilled over a wide range of soil moisture. Capability unit IIe-41; woodland suitability group 3o7.

FaC—Fullerton cherty silt loam, 6 to 15 percent slopes. This soil has the profile described as representative for the series. Included in mapping are small areas of Dewey and Dickson soils and small areas of soils south of Killen that have coarse cherty fragments on the surface and in the profile. Also included are small areas of soils that have a surface layer of loam.

Cotton, corn, small grain, sericea, tall fescue, white clover, and bermudagrass are commonly grown crops. Response to lime and fertilizer is good. If this soil is used for row crops, the use of such good management practices as contour farming, terraces, grassed waterways, stripcropping, and minimum tillage are needed. A cropping system that includes sod crops at least 2 years out of 3 is also needed. Returning crop residue to the soil helps to maintain organic-matter content. This soil can be tilled over a

fairly wide range of soil moisture. Capability unit IIIe-41; woodland suitability group 3o7.

Grasmere Series

The Grasmere series consists of deep, moderately well drained and well drained, nearly level to depressional soils along small drainageways on uplands. These soils formed in fine-textured material; the material washed from adjacent, higher lying soils that formed in material weathered from limestone.

In a representative profile the surface layer is dark reddish-brown silty clay loam 7 inches thick. The upper part of the subsoil is dark reddish-brown silty clay 17 inches thick. Dark reddish-brown silty clay loam extends to a depth of 32 inches. Below this is dark-red clay to a depth of 60 inches or more.

Infiltration and permeability are moderate to moderately slow where surface drainage is adequate. Available water capacity is high.

Almost all of the acreage of these soils has been cleared and is in crops or pasture. The native vegetation is mixed hardwoods.

Representative profile of Grasmere silty clay loam, which has slopes of 0 to 2 percent, in cropland, about 3 miles south and ½ mile east of Rhodesville, SW¼SE¼ sec. 36, T. 2 S., R. 13 W.:

Ap—0 to 7 inches, dark reddish-brown (5YR 3/3) silty clay loam; weak, fine, granular structure; friable; many fine roots; medium acid; gradual, smooth boundary.

B2—7 to 24 inches, dark reddish-brown (5YR 3/3) silty clay; weak, fine and medium, subangular blocky structure parting to weak, medium, granular; friable; common fine roots; strongly acid; clear, smooth boundary.

Ab—24 to 32 inches, dark reddish-brown (5YR 3/2) silty clay loam; weak, medium, granular structure; few fine roots; strongly acid; clear, smooth boundary.

B1b—32 to 40 inches, dark-red (2.5YR 3/6) clay; weak, medium, subangular blocky structure; firm, sticky, plastic; few, thin, patchy clay films on faces of some peds; very strongly acid; gradual, smooth boundary.

B2tb—40 to 60 inches, dark-red (2.5YR 3/6) clay; moderate, medium, subangular blocky structure; firm, sticky, plastic; thin, patchy clay films on faces of most peds; very strongly acid.

The Ap and the B2 horizons range from reddish brown to dark reddish brown. The Ab horizon is dark-brown to reddish-brown silt loam or silty clay loam and is mottled in shades of yellow and gray in some places. The B1b horizon is reddish-brown to dark-red silty clay or clay. The B2tb horizon is dark red to dusky red. The profile is strongly acid to very strongly acid throughout, except for the Ap horizon where limed.

Grasmere soils in Lauderdale County are less clayey than is defined as within the range of the Grasmere series; this difference, however, does not alter their usefulness and behavior.

Grasmere soils are associated with Decatur and Dewey soils. They have a mantle of recent silty and clayey material, more than 20 inches thick, overlying buried A and B horizons, unlike Dewey and Decatur soils.

Gr—Grasmere silty clay loam. This soil has slopes of 0 to 2 percent. Included in mapping are a few small areas of somewhat poorly drained soils that formed in the same alluvial material as this Grasmere soil and small areas of Decatur and Dewey soils. Also included are small areas of soils that have a surface layer of silt loam.

This Grasmere soil is well suited to all crops commonly grown in the county. Corn, cotton, soybeans, and small grain are the commonly grown field crops. Response to lime and fertilizer is good. Cultivated crops can be grown each year. Returning crop residue to the soil helps to maintain organic-matter content. Most areas are subject to seasonal flooding. Field ditches are sometimes needed to remove surface water. This soil can only be tilled over a narrow to medium range of soil moisture. Capability unit IIw-41; woodland suitability group 1o7.

Guthrie Series

The Guthrie series consists of deep, poorly drained, nearly level to depressional soils on uplands. These soils have a fragipan at a depth of about 20 to 30 inches. They formed in residuum weathered from cherty limestone.

In a representative profile in a forested area, the surface and subsurface layers are dark-gray and light brownish-gray silt loam about 6 inches thick. The upper part of the subsoil is 17 inches thick. It is gray and light-gray silt loam mottled with yellowish brown and dark gray. Below this is a fragipan. It is brittle, gray silt loam and silty clay loam mottled with light gray, brownish yellow, yellowish brown, and yellowish red. It extends to a depth of 54 inches.

Infiltration and permeability are slow to very slow. Available water capacity is high.

Some of the acreage of these soils has been cleared and is in pasture and hay. The native vegetation was mainly oak (fig. 9), gums, and maple.

Representative profile of Guthrie silt loam, which has slopes of 0 to 2 percent, in a wooded area, about 0.8 mile south of Tennessee State line, about 75 feet west of U.S. Highway 43, SE¼SE¼ sec. 6, T. 1 S., R. 9 W.:

A1—0 to 1 inch, dark-gray (10YR 4/1) silt loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; clear, smooth boundary.

A2—1 to 6 inches, light brownish-gray (10YR 6/2) silt loam; weak, fine, granular structure; friable; many roots; very strongly acid; gradual, smooth boundary.

B1g—6 to 15 inches, gray (10YR 5/1) silt loam; common, medium, distinct, yellowish-brown (10YR 5/8) mottles; weak, medium, subangular blocky structure; friable; few roots; very strongly acid; gradual, smooth boundary.

B2g—15 to 23 inches, light-gray (10YR 7/2) silt loam; common, coarse, distinct, yellowish-brown (10YR 5/8) and dark-gray (10YR 4/1) mottles; moderate, medium, subangular blocky structure; friable to firm; thin, patchy clay films on faces of some peds; very strongly acid; gradual, smooth boundary.

Bx1—23 to 32 inches, gray (10YR 5/1) silt loam; common, coarse, distinct, light-gray (10YR 7/1), brownish-yellow (10YR 6/6), and yellowish-red (5YR 4/8) mottles; weak, thin, platy structure parting to weak, fine, subangular blocky; firm and brittle in more than 60 percent of the matrix; few thin veins or streaks of gray (10YR 5/1) silt loam ¼ inch wide extending through the horizon; thick, patchy clay films on faces of most peds; very strongly acid; gradual, smooth boundary.

Bx2—32 to 54 inches, gray (10YR 6/1) silty clay loam; common, medium and coarse, yellowish-brown (10YR 5/8) and yellowish-red (5YR 5/8) mottles; weak, medium, platy structure parting to weak, medium, subangular blocky; firm and brittle in more than 60 percent of the matrix; few veins of gray (10YR 5/1) silty clay loam about ¼ inch wide extending through the horizon; patchy clay films on faces of most peds; very strongly acid.

The Ap horizon is gray to light grayish brown in cultivated areas. The A1 horizon is dark gray to gray. The A2 horizon is silt loam to loam. The B1g and B2g horizons are gray or grayish-brown to light-gray silt loam or silty clay loam mottled in shades of brown and gray. The Bx horizon is gray silt loam to silty clay loam mottled in shades of yellow, gray, brown, and red. In places this horizon has few to common small chert fragments in the lower part. The profile is strongly acid or very strongly acid throughout.

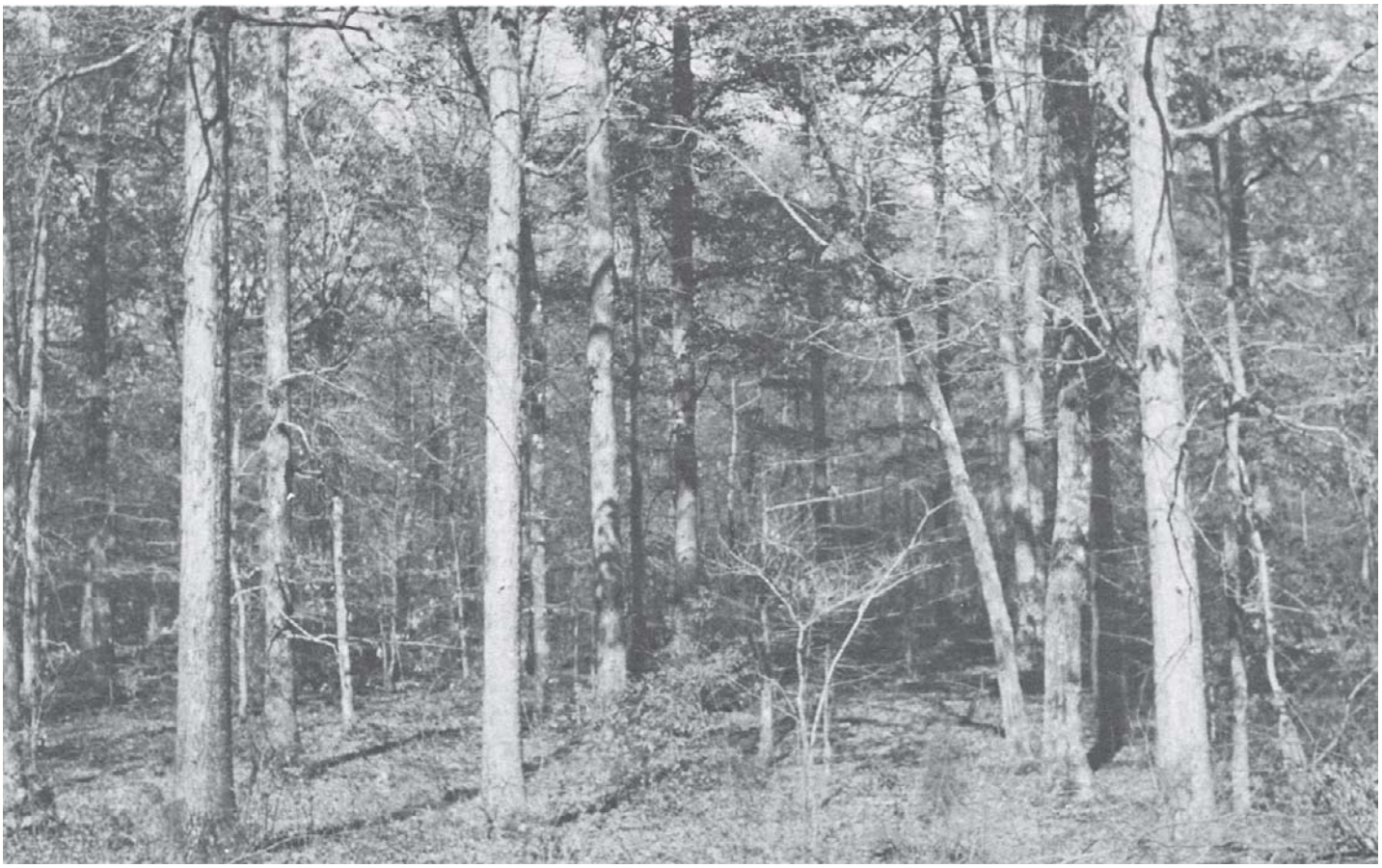

Figure 9.—**White oaks and other hardwoods in an area of Guthrie silt loam.**

Guthrie soils are associated with Dickson and Pruitton soils. Guthrie soils are more poorly drained than Dickson and Pruitton soils.

Gu—Guthrie silt loam. This soil has slopes of 0 to 2 percent. Included in mapping are small areas of Dickson and Pruitton soils.

This Guthrie soil is suited to corn, soybeans, grain sorghum, fescue, and white clover if a good drainage system is provided. Response to lime and fertilizer is moderate to low. Most areas are subject to flooding, and crops are often damaged if not drained. In places water stands on this soil for a few days after heavy rains. Surface field ditches are needed to reduce ponding. Row crops can be grown each year if crop residue is returned to the soil. Tilling is generally delayed in spring because of excess moisture. Wetness often restricts grazing in winter and early spring. Capability unit IVw-49; woodland suitability group 2w9.

Humphreys Series

The Humphreys series consists of deep, well-drained, nearly level soils on low stream terraces and foot slopes. These soils formed in alluvium; the alluvium washed from soils that formed in material weathered from cherty limestone residuum.

In a representative profile the surface layer is dark-brown cherty silt loam 7 inches thick. The upper part of the subsoil is dark yellowish-brown cherty silt loam 5 inches thick. The middle part of the subsoil is strong-brown cherty silty clay loam to a depth of 32 inches. The lower part of the subsoil is dark-brown cherty silty clay loam to a depth of 40 inches. The underlying material is strong-brown cherty clay loam mottled with pale brown to a depth of 56 inches.

Infiltration and permeability are moderately rapid. Available water capacity is moderate.

Almost all the acreage of these soils has been cleared and is in crops and pasture. The rest is in forest or is idle. The native vegetation is mixed hardwoods.

Representative profile of Humphreys cherty silt loam, which has slopes of 0 to 2 percent, in a pasture, about 7 miles northeast of Waterloo, NE¼NE¼ sec. 3, T. 1 S., R. 14 W.:

Ap—0 to 7 inches, dark-brown (10YR 3/3) cherty silt loam; moderate, fine, granular structure; friable; many fine roots; about 15 percent subangular chert fragments, by volume, as much as 1 inch in diameter; medium acid; clear, smooth boundary.

B1—7 to 12 inches, dark yellowish-brown (10YR 4/4) cherty silt loam; moderate, medium, granular structure; friable; common fine roots; about 20 percent angular chert fragments, by volume, as much as 1½ inches in diameter; medium acid; gradual, smooth boundary.

B2t—12 to 32 inches, strong-brown (7.5YR 5/6) cherty silty clay loam; moderate; medium; subangular blocky structure; friable;

Figure 10.—**Mixed hardwoods in an area of Lee cherty silt loam.**

few fine roots; thin, patchy clay films on faces of most peds; about 25 percent angular and subangular chert fragments, by volume, as much as 2 inches in diameter; strongly acid; gradual, smooth boundary.

B3t—32 to 40 inches, dark-brown (7.5YR 4/4) cherty silty clay loam; few, fine, faint, pale-brown (10YR 6/3) mottles; weak, medium, subangular blocky structure; friable; few fine roots; thin, patchy clay films on faces of most peds; about 30 percent angular chert fragments, by volume, as much as 2 inches in diameter; strongly acid; gradual, smooth boundary.

C—40 to 56 inches, strong-brown (7.5YR 5/6) cherty clay loam; few, fine and medium, faint, pale-brown (10YR 6/3) mottles; weak, fine, subangular blocky structure grading to massive; friable; about 35 percent angular chert fragments, by volume, as much as 2 inches in diameter; strongly acid.

The A horizon is dark brown, dark yellowish brown, or dark grayish brown. The B1 horizon is brown or dark yellowish-brown silt loam or loam. The B2t horizon is dark-brown, strong-brown, dark yellowish-brown, or yellowish-red loam, clay loam, or silty clay loam. The B3t horizon is strong-brown or dark-brown silty clay loam or clay loam and is mottled with pale brown. The C horizon is brown or strong-brown clay loam or loam and is mottled with pale brown. The solum is 15 to 35 percent chert fragments, and the material below is as much as 50 percent chert fragments. The profile ranges from medium acid to very strongly acid throughout.

Humphreys soils are associated with Lee and Lobelville soils. Humphreys soils are better drained than Lee and Lobelville soils.

Hu—Humphreys cnerty silt loam. This soil has slopes of 0 to 2 percent. Included in mapping are small areas of Lee and Lobelville soils and small areas of soils that have a surface layer of loam.

This Humphreys soil is suited to all crops commonly grown in the county. Corn, cotton, soybeans, and small grain are commonly grown field crops. Tall fescue, bermudagrass, white clover, annual summer grasses, and annual winter grasses and legumes are commonly grown pasture crops. Response to fertilizer and lime is moderate. Returning crop residue to the soil helps to maintain organic-matter content and good tilth. Row crops can be grown each year if crop residue is returned to the soil. Capability unit IIs-46; woodland suitability group 2o7.

Lee Series

The Lee series consists of deep, poorly drained, nearly level soils on flood plains. These soils formed in loamy alluvium; the alluvium washed from soils that formed in material weathered mainly from cherty limestone and perhaps partly from loess.

In a representative profile the surface layer is dark grayish-brown cherty silt loam about 6 inches thick. It is mottled with light brownish gray. The subsoil is light brownish-gray cherty silt loam 19 inches thick. It is mottled with yellowish brown and dark brown. The underlying material is gray cherty silt loam mottled with dark brown to a depth of 55 inches.

Infiltration and permeability are moderate. Runoff is slow. Overflow is a hazard. Available water capacity is low

to moderate. About 65 percent of the acreage of these soils is in forest (fig. 10). The rest is cleared and is in crops and pasture. Small areas are idle. The native vegetation is mixed hardwoods.

Representative profile of Lee cherty silt loam, which has slopes of 0 to 2 percent, in a pasture, about 1½ miles east of Central Heights, NE¼SW¼ sec. 13, T. 2 S., R. 12 W.:

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) cherty silt loam; few fine, faint, light brownish-gray (10YR 6/2) mottles; weak, fine, granular structure; friable; many fine roots; about 12 percent chert fragments ½ to 1 inch in diameter; strongly acid; clear, smooth boundary.

B2g—6 to 25 inches, light brownish-gray (10YR 6/2) cherty silt loam; common, fine, distinct, yellowish-brown (10YR 5/6) and dark-brown (10YR 3/3) mottles; weak, fine, subangular blocky structure; friable; few fine roots; about 23 percent chert fragments ¼ to ½ inch in diameter; common dark-brown concretions; strongly acid; gradual, smooth boundary.

Cg—25 to 55 inches, gray (10YR 6/1) cherty silt loam; many, medium, distinct, dark-brown (10YR 3/3) mottles; massive; friable; about 32 percent chert fragments ¼ to 1 inch in diameter; common dark-brown concretions; strongly acid.

The A horizon is brown, grayish brown, or dark grayish brown and is mottled in shades of gray and dark grayish brown. The B horizon is gray, grayish-brown, or light brownish-gray silt loam or loam mottled in shades of gray and brown. The C horizon is gray or light gray and is mottled in shades of brown. The solum is 10 to 35 percent chert fragments, ¼ to 1 inch in diameter, and the material below is as much as 60 percent chert fragments. The profile is strongly acid or very strongly acid throughout.

Lee soils are associated with Humphreys, Lobelville, and Pruitton soils. Lee soils are more poorly drained than these soils.

Le—Lee cherty silt loam. This soil has slopes of 0 to 2 percent. Included in mapping are small areas of Lobelville and Pruitton soils and small areas of a similar soil that has less than 15 percent cherty fragments in the upper part of the profile.

This Lee soil is suited to corn, soybeans, grain sorghum, tall fescue, and white clover. Response to lime and fertilizer is good. Row crops can be grown each year if a good drainage system is installed and crop residue is returned to the soil. Surface ditches or underground drainage systems are needed to reduce wetness, but little can be done to prevent overflow in winter and spring. This soil can be tilled over a wide range of soil moisture. Wetness often restricts grazing during late winter and early spring. Capability unit IIIw-42; woodland suitability group 2w9.

Lobelville Series

The Lobelville series consists of deep, moderately well drained, nearly level soils on flood plains. These soils formed in loamy alluvium; the alluvium washed from soils that formed in material weathered mainly from cherty limestone and possibly from some loess.

In a representative profile the surface layer is brown cherty silt loam 6 inches thick. The upper part of the subsoil is brown cherty silt loam 11 inches thick. The middle part of the subsoil is yellowish-brown cherty silt loam mottled with light brownish gray to a depth of 28 inches. The lower part of the subsoil is light-gray cherty silt loam mottled with yellowish brown and gray to a depth of 60 inches.

Infiltration and permeability are moderate. Available water capacity is moderate to low. Overflow is a hazard.

About 60 percent of the acreage of these soils has been

Figure 11.—Corn in an area of Lobelville cherty silt loam.

cleared and is in pasture and crops. The rest is in forest. Some small areas are idle. The native vegetation is hardwoods.

Representative profile of Lobelville cherty silt loam, which has slopes of 0 to 2 percent, in a cultivated field, about 3 miles north of Threet, SW¼SE¼ sec. 5, T. 1 S., R. 12 W.:

Ap—0 to 6 inches, brown (10YR 4/3) cherty silt loam; weak, fine, granular structure; very friable; many fine roots; about 15 percent chert fragments, as much as 1 inch in diameter; medium acid; clear, smooth boundary.

B21—6 to 17 inches, brown (10YR 5/3) cherty silt loam; weak, medium, subangular blocky structure; friable; common fine roots; about 15 percent chert fragments, as much as 1 inch in diameter; strongly acid; gradual, smooth boundary.

B22—17 to 28 inches, yellowish-brown (10YR 5/4) cherty silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, medium, subangular blocky structure; friable; few fine roots; few, fine, dark-brown concretions; about 20 percent chert fragments, as much as 1 inch in diameter; strongly acid; gradual, smooth boundary.

B3g—28 to 60 inches, light-gray (10YR 7/2) cherty silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) and gray (10YR 6/1) mottles; weak, medium, subangular blocky structure or massive; friable; few, fine, dark-brown concretions; about 35 percent chert fragments, as much as 2 inches in diameter; strongly acid.

The A horizon is dark grayish brown or brown. The B21 horizon is dark-brown, brown, or dark yellowish-brown silt loam or loam. The B22 horizon is brown, pale-brown, light yellowish-brown, or yellowish-brown silt loam or loam mottled in shades of gray. The B3g

Figure 12.—**Soybeans in an area of Lobelville cherty silt loam.**

horizon is gray, light gray, or light brownish gray mottled in shades of brown and yellowish brown. The solum is 15 to 35 percent chert fragments, ¼ inch to 2 inches in diameter, and the material below is as much as 60 percent. The profile ranges from medium acid to strongly acid throughout.

Lobelville soils are associated with Humphreys, Lee, and Pruitton soils. They are more poorly drained than Humphreys soils, and are better drained than Lee soils. Lobelville soils have more chert fragments throughout than Pruitton soils.

Lo—Lobelville cherty silt loam. This soil has slopes of 0 to 2 percent. Included in mapping are small areas of Lee and Pruitton soils, and small areas of soils that have a surface layer of loam. Also included are small areas of a similar soil that has less than 15 percent chert fragments in the profile.

This Lobelville soil is suited to corn (fig. 11), soybeans (fig. 12), grain, sorghum, bermudagrass, tall fescue, and white clover. Cotton and small grain can be grown if a good drainage system is installed. All crops may occasionally be damaged by flooding. Row crops can be grown each year if crop residue is returned to the soil. Surface ditches or underground drainage systems are sometimes needed to reduce wetness and to eliminate ponding of surface water. This soil can be tilled over a wide range of soil moisture, but tilling is generally delayed in spring because of the high water table. Capability unit IIIw-42; woodland suitability group 2w8.

Paleudults

PaD3—Paleudults, 6 to 15 percent slopes, severely eroded, consist of soils from which erosion has removed all the surface layer and much of the subsoil. They occur throughout most of the county. The areas are highly dissected by gullies that are deep and wide in places. Between the gullies are remnants of the original soils, mainly of Decatur and Fullerton soils. The soil material is dominantly firm, reddish, and clayey, and some areas contain a high percentage of chert fragments.

Paleudults are strongly acid or very strongly acid. Fertility is low. Available water capacity is low, and permeability is moderate to slow.

The areas of this unit are not suited to cultivated crops. They are suitable for drought-tolerant crops such as sericea, bermudagrass, and tall fescue. Some of the less sloping areas can be shaped and reclaimed for pasture with the use of heavy equipment. Capability unit VIIe-411; woodland suitability group 4c3e.

Pruitton Series

The Pruitton series consists of deep, well-drained, nearly level soils on flood plains. These soils formed in loamy alluvium; the alluvium washed from soils that formed in materials weathered mainly from cherty limestone and possibly from loess.

In a representative profile the surface layer is brown silt loam 9 inches thick. The upper part of the subsoil is brown silt loam 17 inches thick. The lower part of the subsoil is dark yellowish-brown silt loam to a depth of 38 inches. The underlying material is brown fine sandy loam to a depth of 45 inches. Below this, to a depth of 52 inches, it is yellowish-brown cherty sandy loam mottled with dark brown and contains about 35 percent chert fragments ⅛ to 1 inch in diameter.

Infiltration and permeability are moderately rapid. Runoff is slow. Available water capacity is high.

About 80 percent of the acreage of these soils is cleared and is in crops and pasture (fig. 13). The rest is in forest. Some small areas are idle. The native vegetation is mixed hardwoods.

Representative profile of Pruitton silt loam, which has slopes of 0 to 2 percent, in a pasture, about ¾ mile northwest of Pruitton along Butler Creek, SW¼NE¼ sec. 6, T. 1 S., R. 10 W.:

Ap—0 to 9 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; many fine roots; 5 percent chert fragments, by volume, ¼ to 1 inch in diameter; medium acid; clear, smooth boundary.

B2—9 to 26 inches, brown (10YR 4/3) silt loam; weak, fine and medium, subangular blocky structure; friable; common fine roots; 2 percent chert fragments, by volume, ¼ to 1 inch in diameter; strongly acid; gradual, smooth boundary.

B3—26 to 38 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; 5 percent chert fragments, by volume, ¼ to 1 inch in diameter; strongly acid; gradual, smooth boundary.

IIC1—38 to 45 inches, brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; very friable; 15 percent chert fragments, by volume, ⅛ to 1 inch in diameter; very strongly acid; gradual, smooth boundary.

IIC2—45 to 52 inches, yellowish-brown (10YR 5/4) cherty sandy loam; common, fine, distinct, dark-brown (10YR 3/3) mottles; structureless; very friable; 35 percent chert fragments, by volume, ⅛ to 1 inch in diameter; very strongly acid.

The A horizon is dark grayish brown, grayish brown, brown, yellowish brown, or dark yellowish brown. The B horizon is brown, dark yellowish-brown, or yellowish-brown silt loam or loam. The IIC1 horizon is brown or dark yellowish-brown silt loam or fine sandy loam. The IIC2 horizon is yellowish brown, dark yellowish brown, or dark brown mottled in shades of gray, yellow, and brown. The A and B horizons are 1 to 10 percent chert fragments, and the IIC horizon is 15 to 35 percent chert fragments. The profile ranges from medium acid to very strongly acid throughout.

Pruitton soils are associated with Humphreys, Lee, and Lobelville soils. They have fewer chert fragments in the A horizon and the upper part of the B horizon than these soils. Pruitton soils are better drained than Lee and Lobelville soils.

Figure 13.—**Farm pond in an area of Pruitton silt loam. In background is pasture of tall fescue on Dickson silt loam.**

Pr—Pruitton silt loam. This soil has slopes of 0 to 2 percent. Included in mapping are small areas of Humphreys, Lee, and Lobelville soils and small areas of soils that have a surface layer of loam.

This Pruitton soil is well suited to all crops commonly grown in the county. Cotton, corn, soybeans, and small grain are commonly grown field crops. Response to lime and fertilizer is good. Row crops can be grown each year. Returning crop residue to the soil helps to maintain organic-matter content. Crops are occasionally damaged and grazing hindered for short periods by flooding. Capability unit I-42; woodland suitability group 2o7.

Saffell Series

The Saffell series consists of deep, well-drained, gravelly, sloping to steep soils on highly dissected uplands in the western part of the county. These soils formed in thick beds of marine sediment.

In a representative profile the surface layer is brown gravelly fine sandy loam 5 inches thick. The upper part of the subsoil is strong-brown gravelly fine sandy loam 7 inches thick. The middle part of the subsoil is yellowish-red gravelly fine sandy clay loam to a depth of 33 inches. The lower part of the subsoil is reddish-brown gravelly fine sandy loam to a depth of 48 inches. The underlying material is light yellowish-brown and brownish-yellow gravelly sandy loam to a depth of 72 inches.

Infiltration and permeability are moderate to rapid. Available water capacity is moderate to low.

About 50 percent of the acreage of these soils has been cleared and is in row crops or pasture. The native vegetation is mixed hardwoods and pines. Saffell soils are a good source of gravel for road construction.

Representative profile of Saffell gravelly fine sandy loam, 6 to 10 percent slopes, in a hayfield, about 4 miles north-northwest of Cloverdale, SW¼SW¼ sec. 3, T. 1 S., R. 12 W.:

Ap—0 to 5 inches, brown (10YR 5/3) gravelly fine sandy loam; weak, fine, granular structure; very friable; many fine roots; about 20 percent gravel, by volume; medium acid; clear, smooth boundary.

B1—5 to 12 inches, strong-brown (7.5YR 5/6) gravelly fine sandy loam; weak, fine, subangular blocky structure; friable; common fine roots; about 35 percent gravel, by volume; strongly acid; gradual, smooth boundary.

B2t—12 to 33 inches, yellowish-red (5YR 5/6) gravelly fine sandy clay loam; moderate, fine, subangular blocky structure; friable; common, fine roots; about 50 percent gravel, by volume; thin, patchy clay films on faces of some peds; some sand grains coated and bridged with clay; strongly acid; gradual, smooth boundary.

B3—33 to 48 inches, reddish-brown (5YR 4/4) gravelly fine sandy loam; weak, fine, granular structure; friable; few fine roots; about 60 percent gravel, by volume; some sand grains bridged with clay; strongly acid; gradual, smooth boundary.

C—48 to 72 inches, light yellowish-brown (10YR 6/4) and brownish-

yellow (10YR 6/8) gravelly sandy loam; massive; friable; about 70 percent gravel, by volume; strongly acid.

The A1 horizon ranges from dark brown to dark grayish brown in uncultivated areas. The Ap and A2 horizons, where present, are brown to grayish brown. The B1 horizon is yellowish-brown to strong-brown gravelly fine sandy loam or gravelly sandy clay loam. The B2t horizon is strong-brown to yellowish-red gravelly fine sandy clay loam to gravelly fine sandy loam. The B3 horizon is dark-brown to reddish-brown gravelly sandy loam or gravelly fine sandy loam. The C horizon is light yellowish-brown, brownish-yellow, strong-brown, or reddish-brown gravelly sandy loam or gravelly sandy clay loam. The B and C horizons are 35 to 70 percent gravel. Reaction is medium acid to strongly acid in the Ap horizon and is strongly acid or very strongly acid throughout the rest of the profile.

Saffell soils are associated with Bodine, Dickson, and Smithdale soils. Most Saffell soils are associated with Bodine soils in the western part of the county. They are less silty than Bodine soils and are more gravelly than Smithdale soils. Saffell soils do not have the fragipan that is typical of Dickson soils.

SaC—Saffell gravelly fine sandy loam, 6 to 10 percent slopes. This soil has the profile described as representative of the series. Included in mapping are small areas of Bodine, Dickson, and Smithdale soils and small areas of soils that have a surface layer of gravelly sandy loam.

This Saffell soil is suited to all crops commonly grown in the county. Most crops are damaged by drought. Response to lime and fertilizer is good. Fertilizer should be applied in split applications because leaching of nutrients is likely. The hazard of erosion is severe. If this soil is used for row crops, good crop residue management and a cropping system that includes close-growing sod crops at least 2 years out of 3 are needed. Natural drainageways should remain in sod if row crops are grown. Only the less sloping areas are suited to terraces because grassed waterways, in connection with terrace systems, are difficult to establish. This soil can be tilled over a wide range of soil moisture. Capability unit IIIe-13; woodland suitability group 4f2.

SBF—Saffell and Bodine soils, steep. The soils in this undifferentiated group are deep, well drained or excessively drained, and gravelly and cherty. Slopes range from 10 to 35 percent. The soils are on highly dissected uplands in the western part of the county. The uplands consist of narrow winding ridgetops and steep side slopes that terminate in narrow, winding valleys and in drainageways that are V-shaped in places. Included in mapping are small areas of Lee and Lobelville soils on narrow overflow bottoms and some Saffell soils that have less than 10 percent slopes on the narrow ridgetops.

This mapping unit is about 80 percent Saffell soils, 18 percent Bodine soils, and 2 percent minor soils.

The Saffell soils are on the ridgetops and upper parts of the steep side slopes. They are in a mantle of marine sediment of variable thickness that overlies material similar to that of the Bodine soils. The Bodine soils are on steep side slopes and on steep foot slopes in most areas of the mapping unit. The minor soils are on the narrow stream bottoms.

Runoff is medium to rapid, and the hazard of erosion is high.

Steepness, droughtiness, and high gravel or chert content affect the use and management of these soils. These soils are not suited to row crops. The less sloping areas, however, are suited to pasture plants such as sericea and tall fescue. Response to fertilizer and lime is moderate. Seedbeds are difficult to prepare, and stands are difficult to establish. Capability unit VIIs-13 for Saffell soil and VIIs-43 for Bodine soil; woodland suitability group 4f2 for Saffell soil and 3f8 for Bodine soil.

Smithdale Series

The Smithdale series consists of deep, well-drained, gently sloping to sloping soils on uplands. These soils formed in beds of unconsolidated sandy loam and sandy clay loam marine sediment.

In a representative profile the surface and subsurface layers are dark-brown and brown fine sandy loam 7 inches thick. The upper part of the subsoil is yellowish-red sandy clay loam 15 inches thick. The middle part of the subsoil is yellowish-red sandy clay loam mottled with red and strong brown to a depth of 31 inches and red sandy clay loam to a depth of 52 inches. The lower part of the subsoil is red fine sandy loam that has pale-brown and grayish-brown pockets of uncoated sand grains to a depth of 66 inches.

Infiltration and permeability are moderate to moderately rapid. Available water capacity is moderate to high.

Most of the soils that have slopes of 6 percent or less are cleared and are in row crops or pasture. The native vegetation is mixed hardwoods and pines.

Representative profile of Smithdale fine sandy loam, 5 to 10 percent slopes, in a wooded area, about 1¼ miles southwest of Stewartville on south side road cut, SE¼SE¼ sec. 27, T. 1 S., R. 13 W.:

A1—0 to 1 inch, dark-brown (10YR 3/3) fine sandy loam; weak, fine, granular structure; very friable; many fine roots and common medium roots; strongly acid; clear, smooth boundary.

A2—1 to 7 inches, brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; very friable; many fine roots and common medium roots; about 2 percent gravel, by volume, ½ to 1 inch in diameter; strongly acid; gradual, smooth boundary.

B21t—7 to 22 inches, yellowish-red (5YR 5/8) sandy clay loam; weak, fine, subangular blocky structure; friable; thin, patchy clay films on faces of some peds; some sand grains coated and bridged with clay; common fine and medium roots; about 2 percent gravel, by volume, ½ to 1 inch in diameter; strongly acid; gradual, smooth boundary.

B22t—22 to 31 inches, yellowish-red (5YR 5/8) sandy clay loam; few, fine, faint, red (2.5YR 4/8) and strong-brown (7.5YR 5/8) mottles or splotches; moderate, fine, subangular blocky structure; friable; thin, patchy clay films on faces of some peds; some sand grains bridged with clay; few fine roots; about 3 percent gravel, by volume, ½ to 1 inch in diameter; strongly acid; gradual, smooth boundary.

B23t—31 to 46 inches, red (2.5YR 4/8) sandy clay loam; weak, medium, subangular blocky structure; friable; thin, patchy clay films on faces of some peds; some sand grains bridged with clay; few roots; about 5 percent gravel, by volume, ½ to 1 inch in diameter; strongly acid; gradual, smooth boundary.

B24t—46 to 52 inches, red (2.5YR 4/8) sandy clay loam; common, fine, distinct, light yellowish-brown (10YR 6/4) mottles; weak, medium, subangular blocky structure; friable; thin, patchy clay films on faces of some peds; some sand grains bridged with clay; about 5 percent gravel, by volume, ½ to 1 inch in diameter; strongly acid; clear, smooth boundary.

B3t—52 to 66 inches, red (2.5YR 4/8) fine sandy loam; common, medium, distinct, pale-brown (10YR 6/3) and grayish-brown (10YR 5/2) pockets of uncoated sand grains; weak, fine, granular structure; very friable; about 10 percent gravel, by volume, ½ inch to 2 inches in diameter; strongly acid.

The A1 and Ap horizons are dark brown to light yellowish brown. The B1 horizon, where present, is strong-brown fine sandy loam or sandy clay loam. The B2t horizon is yellowish-red to red loam or sandy clay loam. The B3t horizon is yellowish-red fine sandy loam or loam. It has pockets of pale-brown, uncoated sand grains in some places. The profile is medium acid or strongly acid throughout.

Smithdale soils are associated with Dickson and Saffell soils. Smithdale soils do not have the fragipan that is typical of Dickson soils. They are not so high in gravel content as Saffell soils.

SmC—Smithdale fine sandy loam, 5 to 10 percent slopes. This is the only Smithdale soil mapped in the county. Included in mapping are small areas of adjacent Dickson and Saffell soils, some small areas of Smithdale soils that have slopes of less than 5 percent, and some areas of soils that have slopes of more than 10 percent.

This Smithdale soil is suited to all crops commonly grown in the county. Corn, cotton, small grain, soybeans, tall fescue, and bermudagrass are the commonly grown field crops. Response to lime and fertilizer is good. If the soil is used for row crops, erosion is a hazard. The use of contour farming, grassed waterways, terraces, and minimum tillage helps to reduce erosion. A cropping system that includes close-growing sod crops about 2 years out of 3 is needed. Capability unit IIIe-12; woodland suitability group 3o1.

Staser Series

The Staser series consists of deep, well-drained, nearly level soils on low stream terraces. These soils formed in alluvium; the alluvium washed from soils that formed in material weathered from limestone, shale, and sandstone residuum.

In a representative profile the surface layer is dark-brown silt loam 8 inches thick. The subsurface layer is dark-brown loam 34 inches thick. The subsoil is brown fine sandy loam to a depth of 55 inches.

Infiltration and permeability are moderate to moderately rapid. Runoff is moderately slow. Occasional flooding is a hazard, but crops are seldom damaged. Available water capacity is high.

About 90 percent of the acreage of these soils has been cleared and is in crops and pasture. The rest is in forest. A few small areas are idle. The native vegetation is mixed hardwoods.

Representative profile of Staser silt loam, which has slopes of 0 to 2 percent, in a pasture, about 150 feet northeast of Seven Mile Island Landing, NW¼NW¼ sec. 29, T. 3 S., R. 11 W.:

Ap—0 to 8 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; many fine roots; common fine mica flakes; medium acid; clear, smooth boundary.

A12—8 to 42 inches, dark-brown (10YR 3/3) loam; weak, medium, subangular blocky structure parting to weak, medium, granular; friable; common fine roots; common fine mica flakes; medium acid; clear, smooth boundary.

B—42 to 55 inches, brown (10YR 4/3) fine sandy loam; weak, medium, subangular blocky structure parting to weak, fine, granular; very friable; common fine mica flakes; medium acid.

The Ap horizon is dark brown or very dark grayish brown. The A12 horizon is dark-brown, very dark grayish-brown, or dark yellowish-brown silt loam or loam. The B horizon is brown or dark yellowish-brown silt loam or fine sandy loam and in places has brown mottles. The profile is slightly acid or medium acid throughout.

Staser soils are associated with Chenneby, Choccolocco, and Etowah soils. Staser soils are better drained than Chenneby soils and have a thicker A horizon than Choccolocco and Etowah soils.

St—Staser silt loam. This soil has slopes of 0 to 2 percent. Included in mapping are small areas of Chenneby, Choccolocco, and Etowah soils and small areas of soils that have a surface layer of loam.

This Staser soil is well suited to all crops commonly grown in the county. Corn, soybeans, and small grain are the commonly grown field crops. Response to lime and fertilizer is good. Row crops can be grown each year. Returning crop residue to the soil helps to maintain organic-matter content. Capability unit I-46; woodland suitability group 2o7.

Use of the Soils for Crops and Pasture [2]

This section explains how the soils of Lauderdale County can be managed for crops and pasture. It describes the capability classification system used by the Soil Conservation Service and discusses management practices for groups of soils that have similar potential and requirements. It also gives estimates of the average yield of crops commonly grown.

Capability Grouping

Some readers, particularly those who farm on a large scale, may find it practical to use and manage alike some of the different kinds of soil on their farm. These readers can make good use of the capability classification system, a grouping that shows, in a general way, the suitability of soils for most kinds of farming.

The grouping is based on permanent limitations of soils when used for field crops, the risk of damage when they are farmed, and the way the soils respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slopes, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations for range, for forest trees, or for engineering.

In the capability system, all kinds of soil are grouped at three levels: the class, the subclass, and the unit. The broadest grouping, the capability class, is designated by Roman numerals I to VIII. In class I are the soils that have the fewest limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and land forms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products. The subclass indicates major kinds of limitations within the classes. Within most of the classes there can be up to four subclasses. The subclasses are indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of ero-

[2] LEWIS D. WILLIAMS, conservation agronomist, Soil Conservation Service, helped to prepare this section.

sion unless close-growing plant cover is maintained; *w* means that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artifical drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c* indicates that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses w, s, and c, because the soils are subject to little or no erosion but have other limitations that confine their use largely to pasture, range, or wildlife.

Subclasses are further divided into groups called capability units. These are groups of soils that are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have generally similar productivity and other responses to management. Capability units are generally identified by numbers assigned locally, for example, IIe-41 or IIIw-42.

The eight classes in the capability system and the subclasses and units in Lauderdale County are described in the list that follows. The unit designation is given in the "Guide to Mapping Units."

Class I. Soils that have few limitations that restrict their use (no subclasses).
- Unit I-42. Deep, nearly level, well-drained soils that have a loamy surface layer and subsoil; on flood plains.
- Unit I-46. Deep, nearly level, well-drained soils that have a loamy surface layer and subsoil; on low terraces.

Class II. Soils that have moderate limitations that reduce the choice of plants or require moderate conservation practices.
- Subclass IIe. Soils subject to moderate erosion if they are not protected.
  - Unit IIe-41. Deep, gently sloping, well-drained soils that have a loamy surface layer and are clayey in the lower part of the subsoil; on uplands.
  - Unit IIe-42. Deep, gently sloping to sloping, well-drained soils that have a loamy surface layer and subsoil; on stream terraces.
  - Unit IIe-49. Deep, gently sloping, moderately well-drained soils that have a loamy surface layer and a subsoil with a fragipan; on uplands and high stream terraces.
- Subclass IIw. Soils moderately limited because of excess water.
  - Unit IIw-41. Deep, nearly level, well-drained soils that have a loamy surface layer and clayey subsoil; in depressions, along drainageways, and on uplands; subject to ponding and flooding.
  - Unit IIw-49. Deep, nearly level, moderately well-drained soils that have a loamy surface layer and a subsoil with a fragipan; on uplands and high stream terraces.
- Subclass IIs. Soils moderately limited because of chert fragments.
  - Unit IIs-46. Deep, nearly level, well-drained cherty soils that have a loamy surface layer and subsoil; on low stream terraces and foot slopes.

Class III. Soils that have severe limitations that reduce the choice of plants, require special conservation practices, or both.
- Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IIIe-12. Deep, gently sloping to sloping, well-drained soils that have a loamy surface layer and subsoil; on uplands.
  - Unit IIIe-13. Deep, sloping, well-drained, gravelly soils that have a loamy surface layer and subsoil; on uplands.
  - Unit IIIe-41. Deep, sloping and strongly sloping, well-drained soils that have a loamy surface layer and a clayey subsoil; on uplands.
  - Unit IIIe-49. Deep, sloping, moderately well-drained soils that have a loamy surface layer and subsoil with a fragipan; on uplands.
- Subclass IIIw. Soils that are severely limited for farming because of excess water.
  - Unit IIIw-42. Deep, nearly level, moderately well-drained to poorly drained soils that have a loamy surface layer and subsoil or a cherty loamy surface layer and subsoil; on flood plains and low stream terraces that are subject to flooding.

Class IV. Soils that have very severe limitations that reduce the choice of plants, require very careful management, or both.
- Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.
  - Unit IVe-411. Deep, sloping, well-drained, eroded soils that have a loamy surface layer and clayey subsoil; on uplands.
- Subclass IVw. Soils that are very severely limited because of excess water.
  - Unit IVw-49. Deep, nearly level to depressional, poorly drained soils that have a loamy surface layer and subsoil with a fragipan; on uplands.

Class V. (None in Lauderdale County). Soils that are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture or range, woodland, or wildlife habitat.

Class VI. (None in Lauderdale County). Soils that have severe limitations that make them generally unsuited to farming and limit their use largely to pasture or range, woodland, or wildlife habitat.

Class VII. Soils that have very severe limitations that make them unsuited to farming and restrict their use largely to pasture or range, woodland, or wildlife food and cover.
- Subclass VIIe. Soils that are very severely limited, chiefly by risk of erosion, if protective cover is not maintained.
  - Unit VIIe-411. Deep, sloping to strongly sloping, well-drained, severely eroded soils that have a clayey surface layer and subsoil; on uplands.
- Subclass VIIs. Soils that are very severely limited, mainly by hazard of erosion, if protective cover is not maintained.
  - Unit VIIs-13. Deep, strongly sloping to steep,

well-drained to excessively drained, gravelly and cherty soils that have a loamy surface layer and subsoil; on uplands.

Unit VIIs-43. Deep, strongly sloping to steep, well-drained to excessively drained, cherty soils that have a loamy surface layer and subsoil; on uplands.

Class VIII. (None in Lauderdale County). Soils and landforms that have limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife habitat, water supply, or esthetic purposes.

General Principles of Soil Management

Good cropland management practices that result in good stands and rapid growth provide some protection from soil erosion, increase the amount of crop residue that can be returned to the soil, and improve crop yields. Some of the management practices that are needed on all cropped soils are:

1. Application of lime and fertilizer according to crop needs as determined by soil tests.
2. Use of crop varieties that have been tested and found suited by the Auburn University Experiment Station.
3. Preparation of seedbeds as needed for the crop. Seedbeds prepared too far in advance of planting result in excessive soil erosion.
4. Planting of crops by a suitable method, at the proper rate, and at the right time.
5. Use of weed, insect, and disease control to ensure growth of strong, healthy crops.

Conservation practices need to be specifically planned to fit the soil and the cropping system used. Soils that are almost level generally do not require extensive application of conservation practices; however, soils that are strongly sloping generally require several practices to help to reduce erosion and excessive runoff. Some of the most common practices used on sloping upland soils are:

1. Use of conservation cropping systems that include close-growing sod crops and that help to reduce erosion, runoff, and problems from crop pests and that result in increased crop yields.
2. Use of contour farming and tillage operations that result in slower movement of runoff water. This gives water more time to be absorbed by the soil.
3. Use of minimum tillage that results in less soil compaction. Minimum tillage practices that are performed by planting in narrow seedbeds and leaving residue on the rest of the soil surface help to reduce erosion and runoff.
4. Use of properly constructed terraces that help to reduce erosion. Well-established grassed waterways or grassed disposal areas are essential for safe disposal of runoff water at terrace outlets. Terrace systems that use underground tile outlets can be used on some soils where waterways are difficult to establish and maintain.
5. Use of contour stripcropping. Alternate strips of cultivated crops and close-growing crops that follow the contour help to reduce erosion.
6. Use of grassed waterways. Natural drainageways or constructed outlets need to be established and maintained in perennial, sod-forming grass. Well-established waterways help to prevent gullies from forming in areas where concentrated runoff water leaves the field.
7. Management of crop residue. Crop residue should be shredded and left on the soil surface until preparation of the land for the next crop.
8. Use of cover crops. Soils that are left bare after harvest should be planted to cover crops to prevent erosion and provide residue to be returned to the soil.

Good management is very important in establishing and maintaining pasture and hayland. Several practices that apply to all soils used for grassland are:

1. Proper fertilization. Lime and fertilizers should be applied according to soil test analysis.
2. Rotational grazing. Removing livestock from pastures to allow regrowth of the plants helps to increase the life of the stand.
3. Proper grazing or cutting heights. A good ground cover should be maintained at all times by rotational grazing or by adjusting stocking rates. Overgrazed pastures result in weak plants that can die or become infested with weeds.
4. Weed control. Weeds should be controlled by mowing or spraying with specified herbicides.
5. Scattering droppings. Droppings may sometimes need scattering on heavily grazed pastures to increase utilization of forage.

Estimated Yields

The estimated average yields of the principal crops grown in Lauderdale County are shown in table 2 for each soil mapped. The estimates assume a high level of management. They are based on records of actual yields on local farms, on yields obtained in long-term experiments, and on estimates made by agricultural workers who have had experience with crops and soils. All estimates are based on an average amount of rainfall in the area over a long period of time without irrigation.

The management required to obtain the yields shown in table 2 is as follows:

1. Fertilizer and lime are added according to the needs indicated by soil tests.
2. Cropping systems suggested in the section "General Principles of Soil Management" are followed.
3. Water is used or is disposed of by contour cultivation or artificial drainage.
4. Seedbeds are well prepared and properly seeded.
5. Well suited crop varieties and seed mixtures are used at proper planting rates and optimum planting dates.
6. Diseases, insects, and undesirable plants are controlled.
7. Grazing is planned and regulated.

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

[Absence of figure indicates that crop is not commonly grown on the soil or is not suited to that soil]

Soil	Cotton (lint)	Corn	Wheat	Soybeans	Grain sorghum	Sericea hay	Fescue and legumes	Sericea
	Lb	*Bu*	*Bu*	*Bu*	*Bu*	*Tons*	*AUM*	*AUM* [1]
Armour silt loam	700	100	45	35	60	2.5	7.0	3.5
Bodine cherty silt loam, 10 to 35 percent slopes							2.0	2.0
Chenneby silt loam		90		30	60		7.0	
Choccolocco silt loam	900	100	40	35	50	2.5	9.5	3.5
Decatur silt loam, 2 to 6 percent slopes	1,000	90	40	35	60	3.0	8.5	5.0
Decatur silty clay loam, 6 to 10 percent slopes, eroded	800	60	35	30	40	2.0	6.0	4.0
Dewey silt loam, 2 to 6 percent slopes	900	80	45	40	60	3.0	7.0	5.0
Dewey silt loam, 6 to 10 percent slopes	700	65	45	30	45	2.5	6.0	5.0
Dewey silty clay loam, 6 to 10 percent slopes, eroded	600	50	35	25	40	1.5	5.0	4.0
Dickson silt loam, 0 to 2 percent slopes	650	70	30	30	35	3.0	6.0	3.0
Dickson silt loam, 2 to 6 percent slopes	700	70	30	30	40	3.0	6.0	4.0
Dickson silt loam, 6 to 10 percent slopes	500	55	25	25	30	2.5	5.0	3.5
Etowah silt loam, 2 to 8 percent slopes	800	85	45	30	60	3.0	7.0	5.0
Fullerton cherty silt loam, 2 to 6 percent slopes	700	65	40	25	50	2.5	6.0	5.0
Fullerton cherty silt loam, 6 to 15 percent slopes	500	55	35	20	40	1.5	6.0	5.0
Grasmere silty clay loam	800	100	35	30	60	3.0	6.5	5.0
Guthrie silt loam		45		25	40		5.5	
Humphreys cherty silt loam	800	70	40	25	60	3.0	6.0	5.0
Lee cherty silt loam		50		25	60		7.5	
Lobelville cherty silt loam		65	30	30	60		6.5	
Paleudults, 6 to 15 percent slopes, severely eroded								
Pruitton silt loam	750	100	45	35	70		7.0	
Saffell gravelly fine sandy loam, 6 to 10 percent slopes	400	45	25	15	20	2.5	5.0	3.0
Saffell and Bodine soils, steep							2.0	2.0
Smithdale fine sandy loam, 5 to 10 percent slopes	500	55	30	25	25	2.5	5.5	3.5
Staser silt loam	800	100	40	35	40	2.5	8.0	4.0

[1] AUM stands for animal-unit-month. The figures represent the number of months that 1 acre provides grazing for one animal (1,000 pounds live weight), or the number of months the pasture can be grazed multiplied by the number of animal units an acre supports.

Use of the Soils for Woodland [3]

Forest covers 33 percent of Lauderdale County, about 154,000 acres. From 1963 to 1972, the area of forest decreased 12 percent. Ninety percent of the county's forest land is privately owned; 7 percent is owned by industry; and the remaining 3 percent is publicly owned (*11*).

The forest types are mainly hardwoods: oak-hickory forest covers 115,500 acres, oak-pine forest 22,000 acres; oak-gum-cypress forest 11,000 acres; and loblolly-shortleaf pine forest 5,500 acres. For the most part, hardwoods grow well along streams, on northerly slopes, and in coves. Pine generally grow better on uplands. The county contains some good stands of merchantable trees.

The forests of Lauderdale County contain 44,000 acres of sawtimber, 55,000 acres of poletimber, and 55,000 acres of saplings and seedlings. For the most part, production capacity of the forests ranges from moderate to moderately high.

Six primary wood-using plants are located in Lauderdale County (*2*) and provide employment for local people. Value of the local wood products industry is well below its potential.

Woodland Suitability Groups

The soils of Lauderdale County have been placed in woodland suitability groups to assist owners in planning the use of their soils for wood crops. Each group is made up of soils that are suited to the same kinds of trees, that need approximately the same kind of management when the vegetation on them is similar, and that have about the same potential productivity.

Each woodland suitability group is identified by a three-part symbol, such as 2w8, 3o7, or 4f2. The first part of the symbol, always a number, indicates relative potential productivity of the soils in the group: 1 means very high; 2, high; 3, moderately high; 4, moderate; and 5, low. These ratings are based on field determinations of average site index. Site index is the height, in feet, that the dominant trees of a given species, on a specified kind of soil, reach in a natural, unmanaged stand in a stated number of years. For the marketable hardwoods and softwoods in this county, the site index is the height reached in 50 years, except for cottonwood and sycamore, for which the index is the height reached in 30 years.

The five foregoing ratings are based on field determination of the average site index of an indicator forest type or species. Site indexes are grouped into site quality classes. These classes are used to arrive at approximate expected yields per acre in cords and board feet. On the basis of research studies, site index can be converted into approximate expected growth and yield per acre in cords and board feet. For this survey, conversions of average site index into volumetric growth and yield are based on research on loblolly and shortleaf pines (*6*), cottonwood (*10*), and oaks (*8*).

The second part of the symbol identifying a woodland group is a small letter. This letter indicates an important soil property that imposes a slight to severe hazard or limitation in managing the soils of the group for wood crops. A letter *c* shows that the main limitation is the kind or amount of clay in the upper part of the soils in the group; *o* shows that the soils have few limitations that restrict

[3] J. L. JOHNSON, woodland conservationist, Soil Conservation Service, helped to prepare this section.

their use for trees; *w* shows that water in or on the soil, either seasonally or year round, is the chief limitation; *f* shows that the main limitation is large amounts of coarse fragments in the profile, more than 2 inches and less than 10 inches in diameter.

The third part of the symbol indicates degree of hazard or limitation and general suitability of the soils for certain kinds of trees.

The numeral *1* indicates soils that have no or only slight limitations and that are best suited to needleleaf trees.

The numeral *2* indicates soils that have one or more moderate limitations and that are best suited to needleleaf trees.

The numeral *3* indicates soils that have one or more severe limitations and that are best suited to needleleaf trees.

The numeral *4* indicates soils that have no or only slight limitations and that are best suited to broadleaf trees.

The numeral *5* indicates soils that have one or more moderate limitations and that are best suited to broadleaf trees.

The numeral *6* indicates soils that have one or more severe limitations and that are best suited to broadleaf trees.

The numeral *7* indicates soils that have no or only slight limitations and that are suited to either needleleaf or broadleaf trees.

The numeral *8* indicates soils that have one or more moderate limitations and that are suited to either needleleaf or broadleaf trees.

The numeral *9* indicates soils that have one or more severe limitations and that are suited to either needleleaf or broadleaf trees.

The numeral *0* indicates that the soils are not suitable for producing timber commercially.

To facilitate management, the soils of Lauderdale County have been placed in woodland groups, which are described in the following pages. Important parts of the description of each woodland group are the verbal ratings made for hazard of windthrow, hazard of erosion, limitation to use of equipment, hazard of seedling mortality, and risk of competition from undesirable plants. These ratings are always slight, moderate, or severe. The following explanations of these ratings apply to the descriptions of all the woodland suitability groups in Lauderdale County.

Windthrow hazard measures the effect of the soils on root development and the ability of the soils to hold trees firmly. The hazard is *slight* if the effective rooting depth is more than 20 inches and the tree withstands most winds; *moderate* if effective rooting depth is 10 to 20 inches and if some trees are blown down during periods of excessive soil wetness and strong winds; and *severe* if effective rooting depth is 10 inches or less and if trees will not stand alone in strong winds.

Erosion hazard refers to the potential hazard of soil losses in well-managed woodland. The hazard is *slight* if expected soil losses are small; *moderate* if some soil losses are expected and care is needed during logging and construction to reduce soil losses; *severe* if special methods of operation are necessary for preventing excessive soil losses. In Lauderdale County only the steep soils are subject to severe erosion.

Equipment limitations are rated on the basis of soil characteristics that restrict or prohibit the use of equipment commonly used in tending and harvesting the trees. In Lauderdale County soil characteristics having the most limiting effect are drainage, depth to the water table, slope, and texture of the surface layer. A rating of *slight* means there is no restriction in the kind of equipment or in the time of year it is used; *moderate* means that use of equipment is restricted for less than 3 months of the year; and *severe* means that special equipment is needed and that its use is restricted for more than 3 months of the year.

Seedling mortality refers to the expected degree of mortality of planted seedlings as influenced by kinds of soil when plant competition is not a limiting factor. Considered in the ratings are depth to the water table, hazard of flooding, drainage, soil depth and structure, and degree of erosion. Normal rainfall, good planting stock, and proper planting are assumed. A rating of *slight* indicates an expected loss of less than 25 percent of the planted seedlings; *moderate*, a loss of 25 to 50 percent of the seedlings; and *severe*, a loss of more than 50 percent of the seedlings. Special preparation of the site is needed before planting for soils rated severe and for most soils rated moderate.

Plant competition is rated on the basis of the degree to which unwanted plants invade openings in the tree canopy. Considered in the ratings are available moisture capacity, fertility, drainage, and degree of erosion. A rating of *slight* means that competition from other plants is not a problem; *moderate*, that plant competition delays development of fully stocked stands of desirable trees; and *severe*, that plant competition prevents establishment of a desirable stand unless intensive site preparation and such practices as weeding are used to control undesirable plants.

In table 3 the soils are placed in woodland suitability groups and some important timber species and their average site indexes are shown. The woodland suitability groups are briefly described in the following pages.

WOODLAND SUITABILITY GROUP 1o7

Grasmere silty clay loam is the only soil in this group. It is deep, well drained, and nearly level to depressional. The surface layer is loamy, and the subsoil is clayey.

Equipment limitations are slight.

Both pines and hardwoods grow on this soil, but it is better suited to pines than to other trees. Species to favor in existing stands and trees preferred for planting are loblolly pine, slash pine, yellow-poplar, cottonwood, sweetgum, and sycamore.

WOODLAND SUITABILITY GROUP 1w8

Chenneby silt loam is the only soil in this group. It is deep, somewhat poorly drained, and nearly level and is on flood plains and low stream terraces. The surface layer and subsoil are loamy.

Equipment limitations and seedling mortality are moderate.

Both pines and hardwoods grow well on this soil. Species to favor in existing stands and trees preferred for planting are loblolly pine, yellow-poplar, and sweetgum.

WOODLAND SUITABILITY GROUP 2o7

The soils in this group are deep, well drained, and nearly

TABLE 3.—*Woodland suitability groups, average site indexes, and yearly growth per acre of important trees*

Woodland suitability group and map symbols	Important trees	Average site index	Yearly growth per acre	
			Cords	*Bd ft (Doyle rule)*
Group 1o7: Gr.	Loblolly pine	100	2.7	538
	Slash pine	100	2.9	513
	Yellow-poplar	100	1.4	498
	Sycamore	100		
	Sweetgum	90	1.2	416
	Cottonwood	100	2.1	597
	Red oak	80	.8	244
	White oak	80	.8	244
Group 1w8: Ch.	Loblolly pine	95	2.5	505
	Sweetgum	100	1.4	499
	Yellow-poplar	105	1.6	587
	Bottom-land oaks	90	1.2	332
Group 2o7: Ar, Co, EtB, Hu, Pr, St.	Loblolly pine	90	2.3	452
	Shortleaf pine	75	1.8	320
	Yellow-poplar	95	1.4	310
	Sweetgum	90	1.2	416
	Cottonwood	95	1.7	400
	Black walnut			
	Bottom-land oaks	80	.8	244
Group 2w8: Lo.	Loblolly pine	90	2.3	452
	Shortleaf pine	80	1.8	373
	Sweetgum	90	1.2	416
	Sycamore			
	Bottom-land oaks	85	1.0	260
	Ash			
	Cottonwood	95	1.7	400
	Yellow-poplar	100	1.4	498
Group 2w9: Gu, Le.	Loblolly pine	90	2.3	452
	Shortleaf pine	80	1.8	373
	Cottonwood	95	1.7	400
	Sweetgum	90	1.2	416
	Bottom-land oaks	90	1.2	332
	Ash			
	Sycamore			
	Yellow-poplar	100	1.4	498
Group 3o1: SmC.	Loblolly pine	85	2.1	404
	Shortleaf pine	90	1.8	373
	Slash pine	85	2.1	404
Group 3o7: DaB, DeB, DeC, DoA, DoB, DoC, FaB, FaC.	Loblolly pine	85	2.1	404
	Shortleaf pine	70	1.5	281
	Sweetgum	80	.9	270
	Yellow-poplar	90	1.2	416
	Black walnut			
	Upland oaks	75	1.1	150
Group 3f8: BoE, SBF.	Loblolly pine	80	1.9	364
	Shortleaf pine	70	1.5	281
	Virginia pine	70	1.2	
	Upland oaks	70	.6	116
	Yellow-poplar	90	1.2	416
	Sycamore			
Group 4c3e: DcC2, DfC2, PaD3.	Loblolly pine	70	1.6	262
	Shortleaf pine	60	1.2	204
	Virginia pine	60	1.0	
	Eastern red cedar	40	68 [1]	300 [2]
Group 4f2: SaC, SBF.	Loblolly pine	70	1.6	262
	Shortleaf pine	60	1.2	204
	Virginia pine	60	1.0	
	Eastern redcedar	40	68 [1]	300 [2]

[1] Number of posts.
[2] Based on international rule.

level to sloping and are on flood plains, stream terraces, and foot slopes. The surface layer and subsoil are loamy.

Limitations to management are none to slight.

Both pines and hardwoods grow well on these soils. Species to favor in existing stands and trees preferred for planting are loblolly pine, yellow-poplar, sweetgum, cottonwood, black walnut, and oak.

WOODLAND SUITABILITY GROUP 2w8

The soils in this group are deep, moderately well drained and somewhat poorly drained, and nearly level and are on flood plains and low stream terraces. The surface layer and subsoil are loamy.

Equipment limitations, competition from other plants, and the hazard of windthrow are moderate. Harvesting equipment bogs down and damages roots during wet seasons, but limitations are only moderate. The soils are subject to overflow.

Pines and hardwoods grow well on these soils. Species to favor in existing stands are loblolly pine, sweetgum, sycamore, oak, ash, cottonwood, and yellow-poplar. Trees preferred for planting are loblolly pine, sweetgum, oak, ash, cottonwood, and yellow-poplar. Yellow-poplar, pine, and cottonwood should be planted only in the better drained areas.

WOODLAND SUITABILITY GROUP 2w9

The soils in this group are deep and poorly drained. They are nearly level to depressional on uplands and nearly level on flood plains. The surface layer and subsoil are loamy.

Equipment limitations, competition from other plants, and seedling mortality are severe, and the hazard of windthrow is slight to moderate. Equipment bogs down and damages roots during wet seasons.

Both pines and hardwoods grow on this soil, but hardwoods are dominant. Species to favor in existing stands are loblolly pine, cottonwood, sweetgum, water oak, cherry bark oak, ash, and sycamore. Trees preferred for planting are loblolly pine, ash, cottonwood, sycamore, cherry bark oak, sweetgum, and yellow-poplar. Yellow-poplar, pine, and cottonwood should be planted only in the better drained areas.

WOODLAND SUITABILITY GROUP 3o1

Smithdale fine sandy loam, 5 to 10 percent slopes, is the only soil in this group. It is deep, well drained, and gently sloping to sloping and is on uplands. It is loamy throughout.

Equipment limitations and plant competition are slight.

Both pines and hardwoods grow on this soil, but pines are dominant. Species to favor in existing stands are loblolly pine, slash pine, and shortleaf pine. Trees preferred for planting are loblolly pine and slash pine.

WOODLAND SUITABILITY GROUP 3o7

The soils in this group are deep, well drained and moderately well drained, and nearly level to strongly sloping and are on uplands. The surface layer and subsoil are loamy.

All soil-related limitations to management are slight.

Both pines and hardwoods grow on this soil. Species to favor are loblolly pine, shortleaf pine, sweetgum, yellow-poplar, black walnut, and oak. Trees preferred for planting are loblolly pine, black walnut, and yellow-poplar.

WOODLAND SUITABILITY GROUP 3f8

Bodine cherty silt loam, 10 to 35 percent slopes, is the only soil in this group. It is deep, well drained or excessively drained, and steep and is on uplands. It is loamy throughout.

Equipment limitations, competition from other plants, and seedling mortality are moderate.

Both pines and hardwoods grow in this soil. Species to favor in existing stands and trees preferred for planting are loblolly pine, Virginia pine, and oak. Yellow-poplar and sycamore can be planted on toe slopes and in narrow drainageways.

WOODLAND SUITABILITY GROUP 4c3e

The soils in this group are deep, well drained, and sloping to strongly sloping and are on uplands that have been subjected to moderate and severe erosion. The surface layer and subsoil are loamy.

All soil-related limitations to management are moderate to severe.

Both pines and hardwoods grow on this soil, but it is better suited to pines than to other trees. Species to favor are loblolly pine, shortleaf pine, Virginia pine, sweetgum, yellow-poplar, black walnut, and oak. Trees preferred for planting are loblolly pine and Virginia pine.

WOODLAND SUITABILITY GROUP 4f2

The soils in this group are deep, well drained, gravelly, and sloping to steep and are on uplands. The surface layer and subsoil are loamy.

Equipment limitations and plant competition are slight to moderate, and all other limitations are slight.

Both pines and hardwoods grow on these soils, but pines are dominant. Species to favor in existing stands are loblolly pine and shortleaf pine. Trees preferred for planting are loblolly pine and Virginia pine.

Use of the Soils for Wildlife Habitat [4]

The wildlife population of any area depends on the availability of food, cover, and water in suitable combinations. The habitat is retained or created and maintained by establishing desirable vegetation and by developing a water supply in suitable places.

In table 4 of each of the soils in Lauderdale County is rated according to its suitability for seven elements of wildlife habitat and for three kinds of wildlife. The ratings refer to only the suitability of the soil. They do not take into account present land use or the distribution and density of wildlife and human populations. The suitability of individual sites must be determined by onsite inspection.

A rating of *good* means that a habitat is easily improved, maintained, or created; that there are few or no soil limitations in habitat management; and that satisfactory results can be expected. *Fair* means that a habitat can be improved, maintained, or created; that moderate soil limita-

[4] ROBERT E. WATERS, biologist, Soil Conservation Service, helped to prepare this section.

TABLE 4.—*Suitability of the soils for elements of wildlife habitat and kinds of wildlife*

Soil series and map symbols	Elements of wildlife habitat							Kinds of wildlife		
	Grain and seed crops	Domestic grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland	Woodland	Wetland
Armour: Ar	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Bodine: BoE	Very poor	Poor	Fair	Good	Good	Very poor	Very poor	Poor	Fair	Very poor.
Chenneby: Ch	Fair	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Choccolocco: Co	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Decatur:										
DaB	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
DcC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Dewey:										
DeB	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
DeC, DfC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Dickson:										
DoA	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Poor.
DoB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
DoC	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Etowah: EtB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Fullerton:										
FaB	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
FaC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Grasmere: Gr	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Guthrie: Gu	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Humphreys: Hu	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Lee: Le	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Lobelville: Lo	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Paleudults: PaD3	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Pruitton: Pr	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Saffell:										
SaC	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
SBF	Very poor	Poor	Fair	Good	Good	Very poor	Very poor	Poor	Fair	Very poor.
For Bodine part, see Bodine series.										
Smithdale: SmC	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Staser: St	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.

tions affect habitat management or development; and that moderate intensity of management and fairly frequent attention may be required to ensure satisfactory results. *Poor* means that a habitat can be improved, maintained, or created; that soil limitations are severe; and that habitat management may be difficult and expensive and may require intensive effort. Results are questionable. *Very poor* means that, under the prevailing soil conditions, it is impractical to attempt to improve, maintain, or create a habitat. Unsatisfactory results are probable.

The elements of wildlife habitat and kinds of wildlife rated in table 4 are briefly described in the following paragraphs.

Grain and seed crops refers to domestic grain or other seed-producing annuals that are commonly planted to produce food for wildlife. Examples are corn, sorghum, wheat, oats, barley, millet, cowpeas, soybeans, and sunflower.

Domestic grasses and legumes are perennial grasses and herbaceous legumes that are commonly planted to produce food or cover, or both, for wildlife. Examples are fescue, lovegrass, orchardgrass, clovers, and vetches.

Wild herbaceous plants are native or naturally established dryland herbaceous grasses and forbs (including weeds) that provide either food or cover, or both, for wildlife. Examples are goldenrod, beggarweed, milkpea, ragweed, partridgepea, pokeweed, croton, fescues, and gramas.

Hardwood trees include nonconiferous trees and associated woody understory plants that provide wildlife cover or produce nuts, buds, catkins, twigs, bark, or foliage used as food by wildlife.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish wildlife cover or supply food in the form of browse, seeds, or fruitlike cones. These plants are commonly established through natural processes, but they may be planted or transplanted. Examples are pine, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that are grown on moist to wet sites. Submerged and floating aquatic plants are not included. These plants provide food or cover, or both, for wetland forms of wildlife. Examples are smartweed, wild millet, rushes, sedges, reeds, wild rice, cutgrass, cordgrass, and cattail.

Shallow water areas are areas of surface water that are useful to wildlife. Their average depth is less than 5 feet. They may be natural wet areas or those created by dams, levees, or water-control devices in marshes or streams. Examples are muskrat marshes, waterfowl feeding areas, wildlife watering developments, wildlife ponds, and beaver ponds.

Openland wildlife consists of birds and mammals that normally live on croplands, pastures, meadows, lawns, and areas overgrown with grasses, herbs, shrubs, and vines. Examples are bobwhite quail, meadowlark, field sparrow, killdeer, cottontail rabbit, mourning dove, and red fox.

Woodland wildlife consists of birds and mammals that normally live in wooded areas containing either hardwoods or coniferous trees and shrubs, or a mixture of both. Examples are wild turkey, woodcock, thrushes, vireos, woodpeckers, squirrel, gray fox, raccoon, and whitetailed deer.

Wetland wildlife consists of birds and mammals that normally live in swampy, marshy, or open-water areas. Examples are ducks, geese, herons, shorebirds, rails, kingfisher, muskrat, mink, beaver, and otter.

Engineering Uses of the Soils [5]

This section is useful to those who need information about soils used as structural material or as a foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among the soil properties that are highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain size, plasticity, and soil reaction. Also important are depth to the water table, depth to bedrock, and slope. These properties, in various degrees and combination, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and system for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built for the purposes of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

The engineering information given in tables 5, 6, and 7 does not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads or excavations deeper than the depth reported. Even in these situations, however, the soil map is useful in planning more detailed field investigations and in indicating the kind of problems that may be expected.

Some of the terms used in this survey have a different meaning in soil science than in engineering. The Glossary defines many of these terms as they are commonly used in soil science.

Engineering Soil Classification Systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system

[5] BEAUL D. HUNKAPILLER, civil engineer, Soil Conservation Service, helped to prepare this section.

TABLE 5.—*Engineering*

[Tests performed by the Alabama State Highway Department,

Soil name and location	Parent material	Report number S70A1a-39-	Depth	Moisture-density [1]		Mechanical analysis [2]	
				Maximum dry density	Optimum moisture	Percentage passing sieve— 1½-inch	1-inch
			Inches	*Pounds per cubic foot*	*Percent*		
Decatur silt loam:							
2¾ miles south and ¾ mile east of Oakland, in NE¼NE¼ sec. 15, T. 3 S., R. 12 W. (Modal)	Residuum from limestone.	9-1	0-5	115	12	----------	----------
		9-3	13-38	106	17	----------	----------
		9-4	38-72	107	17	----------	----------
Dickson silt loam:							
0.9 mile south of Tennessee State line, on west side of U.S. Highway 43, in SE¼SE¼ sec. 6, T. 1 S., R. 8 W. (Modal)	Residuum from cherty limestone.	2-2	1-7	97	19	----------	----------
		2-4	11-25	107	15	----------	----------
		2-6	32-44	104	18	----------	----------
		2-7	44-72	96	23	100	99
Lee cherty silt loam:							
1½ miles east of Central Heights, in NE¼SW¼ sec. 13, T. 2 S., R. 12 W. (Modal)	Alluvium mainly from cherty limestone.	10-1	0-6	106	16	----------	100
		10-2	6-25	110	14	----------	100
		10-3	25-48	115	13	----------	[5] 97
Pruitton silt loam:							
¾ mile northwest of Pruitton in SW¼NE¼ sec. 6, T. 1 S., R. 10 W. (Modal)	Stream alluvium.	8-2, 3	9-38	105	17	----------	----------
		8-5	45-52	111	14	100	86

[1] Based on AASHTO Designation T 99-57, method A (*3*).

[2] Mechanical analyses according to AASHTO designation T 88 (*3*). Results obtained by this procedure frequently may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is

(*4*), used by SCS engineers, the Department of Defense, and others; and the AASHTO (*3*) system, adopted by the American Association of State Highway and Transportation Officials.

In the Unified system soils are classified according to particle-size distribution, plasticity, liquid limit, and organic-matter content. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, CL-ML.

The AASHTO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system a soil is placed in one of seven basic groups, ranging from A-1 through A-7, on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A-7, are clay soils that have low strength when wet and are the poorest soils for subgrade. If laboratory data are available to justify a further breakdown, the A-1, A-2, and A-7 groups are divided as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 or more for the poorest. The AASHTO classification for tested soils, with group index numbers in parentheses, is shown in table 5; the estimated classification, without group index numbers, is given in table 6 for all soils mapped in the survey area.

Engineering Test Data

Soil samples from four important series in Lauderdale County were tested by standard procedures to help evaluate the suitability of the soils for engineering purposes. The samples were taken from selected layers of each soil and were sampled to a maximum depth of 6 feet. The test data, therefore, may not be adequate for estimating the characteristics of soil material at depths of more than 6 feet. Tests were made for moisture-density relationship, grain-size distribution, liquid limit, and plasticity index. The results of the tests and the classification of each sample, according to both the AASHTO and Unified systems, are given in table 5.

The engineering classification in table 5 is based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. Mechanical analyses were made by combined sieve and hydrometer methods.

In the moisture-density, or compaction, test, a sample of the soil material is compacted several times with a constant compactive effort, each time at a successively higher moisture content. The density of the compacted material increases as the moisture content increases until the *optimum moisture content* is reached. After reaching that point the density decreases with increase in moisture content. The highest density obtained in the compaction test is termed *maximum dry density*. Moisture-density data are

test data

Bureau of Materials and Tests, Montgomery, Alabama]

Mechanical analysis [2]—Continued						Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Continued									
¾-inch	⅜-inch	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)			AASHTO [3]	Unified
						Percent			
----------	100	99	99	98	72	22	4	A-4 (1)	ML
----------	----------	100	100	99	92	46	22	A-7-6 (22)	CL
----------	----------	100	99	98	90	48	25	A-7-6 (24)	CL
----------	100	99	98	97	93	28	[4] NP	A-4 (0)	ML
----------	100	99	96	95	92	29	6	A-4 (6)	ML
----------	100	96	92	90	87	39	11	A-6 (12)	ML
99	99	91	89	87	81	52	17	A-7-5 (17)	MH
----------	----------	91	83	79	68	26	2	A-4 (0)	ML
----------	----------	77	64	58	50	26	5	A-4 (0)	SM-SC
----------	----------	68	48	45	38	25	5	A-4 (0)	GM-GC
----------	100	99	97	96	88	30	7	A-4 (6)	ML
86	86	70	62	47	25	21	1	A-1-B (0)	SM

excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soils.

[3] Based on AASHTO designation M 145-49 (*3*).

[4] NP = nonplastic.

[5] 100 percent of material passed the 2-inch sieve.

important in construction because optimum stability is generally obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

The results of the mechanical analysis may be used to determine the relative proportions of the different size particles that make up the soil sample. The percentage of the fine-grained material, obtained by the hydrometer method, which generally is used by engineers, should not be used in determining textural classes of soils.

The tests to determine liquid limit and plastic limit measure the effect of water on the consistency of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The *plastic limit* is the moisture content at which the soil material passes from a semisolid to a plastic state. The *liquid limit* is the moisture content at which the soil material passes from a plastic to a liquid state. The *plasticity index* is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition.

Soil Properties Significant to Engineering

Estimates of soil properties significant in engineering are given in table 6. These estimates are made for typical soil profiles, by layers sufficiently different to have different significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the columns in table 6.

Depth to bedrock is the distance from the surface of the soil to the upper surface of the rock layer.

Depth to seasonal high water table is the distance from the surface of the soil to the highest level that ground water reaches in the soil in most years.

Dominant USDA texture is described in table 6 in the standard terms used by the United States Department of Agriculture. These terms take into account relative percentages of sand, silt, and clay in the part of the soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added, as for example, "gravelly loamy sand." "Sand," "silt," "clay," and some of the other terms used in USDA textural classification are defined in the Glossary of this publication.

Permeability is the quality of a soil that enables it to transmit water or air. It is estimated on the basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 6 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is generally defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants.

TABLE 6.—*Estimates of soil*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such mapping that appear in the first column of this table. The

Soil series and map symbols	Depth to—		Depth from surface	Dominant USDA texture	Classification	
	Bedrock	Seasonal high water table			Unified	AASHTO
	Feet	*Feet*	*Inches*			
Armour: Ar	> 4	> 5	0-17	Silt loam, silty clay loam	ML, CL	A-4
			17-42	Silty clay loam	CL	A-6
			42-60	Cherty clay loam	CL, ML	A-6
Bodine: BoE	> 5	> 5	0-15	Cherty silt loam	ML, GM	A-4
			15-50	Cherty silty clay loam	GM	A-1, A-2
			50-72	Cherty silty clay loam	GM	A-1, A-2
Chenneby: Ch	> 6	1-2	0-34	Silt loam	ML	A-4
			34-65	Silty clay loam	ML, CL	A-6
Choccolocco: Co	> 6	> 5	0-13	Silt loam	ML, CL	A-4
			13-40	Silty clay loam	CL, ML	A-6
			40-90	Loam	SM, ML, CL	A-4
Decatur: DaB, DcC2	> 6	> 6	0-7	Silt loam	ML, CL	A-4
			7-72	Clay	CL, MH	A-7
Dewey: DeB, DeC, DfC2	> 6	> 6	0-5	Silt loam	ML-CL	A-4
			5-34	Silty clay	ML-CL	A-6
			34-70	Clay	CL	A-6
Dickson: DoA, DoB, DoC	> 6	2-2½	0-7	Silt loam	ML-CL, ML	A-4
			7-25	Silt loam	ML-CL, ML	A-4
			25-44	Silt loam, silty clay loam (fragipan).	ML-CL, ML	A-6
			44-72	Silty clay	MH	A-7
Etowah: EtB	> 6	> 6	0-13	Silt loam	ML-CL, SM	A-4
			13-45	Silty clay loam	ML-CL	A-4
			45-90	Silty clay loam	ML-CL	A-6
Fullerton: FaB, FaC	> 6	> 6	0-8	Cherty silt loam	ML, SM	A-4, A-2
			8-35	Cherty silty clay loam, cherty silty clay.	ML, GM	A-6, A-2
			35-72	Cherty clay	GM, ML	A-6
Grasmere: Gr	> 6	> 4	0-32	Silty clay loam, silty clay	CL or ML	A-6
			32-60	Clay	CL, MH	A-7
Guthrie: Gu	> 6	0-2	0-32	Silt loam	CL, ML	A-4
			32-54	Silty clay loam (fragipan)	ML, CL	A-6
Humphreys: Hu	> 5	> 5	0-12	Cherty silt loam	ML, CL, GM	A-4
			12-40	Cherty silty clay loam	CL, GM	A-6, A-2
			40-56	Cherty clay loam	CL, GM	A-6, A-2
Lee: Le	> 6	0-2	0-25	Cherty silt loam	ML, GC	A-4
			25-55	Cherty silt loam	GM, CL	A-2, A-4
Lobelville: Lo	> 5	1-3	0-6	Cherty silt loam	ML, CL, GM	A-4
			6-60	Cherty silt loam	CL, GM	A-4
Paleudults: PaD3. No valid estimate can be made.						
Pruitton: Pr	> 5	> 6	0-9	Silt loam	ML, CL	A-4
			9-38	Silt loam	CL, ML	A-4, A-6
			38-52	Cherty sandy loam	SM, ML, CL	A-2, A-4
*Saffell: SaC, SBF For Bodine part of SBF, see Bodine series.	> 5	> 6	0-12	Gravelly fine sandy loam	SM or ML	A-2 or A-4
			12-33	Gravelly fine sandy clay loam	GC or SC	A-2 or A-4
			33-72	Gravelly sandy loam	GM or SM	A-2
Smithdale: SmC	> 5	> 5	0-7	Fine sandy loam	SM	A-4
			7-52	Sandy clay loam	SC, CL	A-6
			52-66	Fine sandy loam	SM	A-4
Staser: St	> 5	> 3	0-8	Silt loam	ML, CL	A-4
			8-42	Loam	CL, ML	A-6
			42-55	Fine sandy loam	SM, ML	A-4

properties significant in engineering

units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series symbol > means more than; < means less than]

Percentage passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)				
				Inches per hour	*Inches per inch of soil*	*pH*	
95-100	90-100	85-100	85-95	0.6-2.0	0.18-0.22	5.1-6.0	Low.
95-100	85-100	80-100	80-95	0.6-2.0	0.17-0.20	5.1-6.0	Low.
65-100	60-95	55-90	55-85	0.6-2.0	0.10-0.18	5.1-6.0	Low.
50-75	40-65	35-60	30-55	2.0-6.0	0.07-0.12	4.5-6.0	Low.
15-60	8-50	5-40	5-35	2.0-6.0	0.05-0.10	4.5-6.0	Low.
15-55	8-50	5-40	5-35	2.0-6.0	0.05-0.10	4.5-6.0	Low.
98-100	95-100	80-90	70-80	0.6-2.0	0.15-0.20	4.5-6.0	Low.
98-100	95-100	80-90	85-95	0.6-2.0	0.15-0.20	4.5-6.0	Low.
95-100	90-100	75-85	55-75	0.6-2.0	0.14-0.18	5.1-6.0	Low.
95-100	90-100	80-90	50-75	0.6-2.0	0.14-0.20	5.1-6.0	Low.
90-100	70-100	60-80	40-75	0.6-6.0	0.12-0.18	5.1-6.0	Low.
98-100	90-98	80-85	65-70	0.6-2.0	0.13-0.18	5.1-6.0	Low.
98-100	98-100	85-90	75-80	0.6-2.0	0.13-0.18	4.5-5.5	Moderate.
90-100	80-100	75-95	65-80	0.6-2.0	0.18-0.20	5.1-6.0	Low.
90-100	80-100	75-95	65-80	0.6-2.0	0.14-0.17	5.1-5.5	Moderate.
90-100	80-100	75-95	70-90	0.6-2.0	0.11-0.15	5.1-5.5	Moderate.
95-100	90-100	80-95	75-90	0.6-2.0	0.18-0.22	4.5-5.5	Low.
95-100	90-100	85-100	85-95	0.6-2.0	0.17-0.20	4.5-5.5	Low.
95-100	90-100	85-100	80-95	0.06-0.2	0.12-0.16	4.5-5.5	Low.
85-100	80-100	75-95	75-90	0.2-0.6	0.12-0.15	4.5-5.5	Moderate.
98-100	95-100	70-95	45-70	0.6-2.0	0.15-0.20	4.5-5.5	Low.
98-100	95-100	90-95	70-90	0.6-2.0	0.16-0.20	4.5-5.5	Low.
98-100	95-100	90-95	70-90	0.6-2.0	0.16-0.20	4.5-5.5	Low.
60-90	50-75	40-75	30-65	0.6-2.0	0.10-0.16	4.5-5.5	Low.
60-90	50-75	40-75	30-65	0.6-2.0	0.10-0.15	4.5-5.5	Low.
60-90	50-75	40-75	40-70	0.6-2.0	0.10-0.14	4.5-5.5	Low.
98-100	95-100	90-100	85-95	0.6-2.0	0.15-0.20	4.5-6.0	Low to moderate.
98-100	95-100	90-100	70-95	0.2-0.6	0.15-0.20	4.5-5.5	Moderate.
98-100	98-100	95-100	95-100	0.6-2.0	0.20-0.23	4.5-5.5	Low.
95-100	95-100	95-100	90-100	<0.2	0.14-0.16	4.5-5.5	Low.
65-85	55-80	45-70	40-65	2.0-6.0	0.10-0.16	4.5-6.0	Low.
65-85	55-80	40-70	30-65	2.0-6.0	0.10-0.16	4.5-6.0	Low.
60-80	35-80	25-60	25-60	2.0-6.0	0.08-0.16	4.5-6.0	Low.
60-75	55-75	50-70	45-65	0.6-2.0	0.09-0.14	4.5-5.5	Low.
35-75	30-75	25-70	20-65	0.6-2.0	0.06-0.12	4.5-5.5	Low.
65-95	55-80	50-75	45-65	0.6-2.0	0.10-0.15	5.1-6.0	Low.
65-90	55-80	50-70	45-65	0.6-2.0	0.09-0.14	5.1-6.0	Low.
80-100	75-98	65-95	60-95	2.0-6.0	0.16-0.20	4.5-6.0	Low.
80-100	75-100	65-97	60-90	2.0-6.0	0.16-0.20	4.5-6.0	Low.
65-90	50-75	35-75	30-70	2.0-6.0	0.05-0.12	4.5-6.0	Low.
75-90	75-85	40-60	20-55	2.0-6.0	0.08-0.12	5.1-6.0	Low
40-65	40-60	40-55	25-40	0.6-2.0	0.10-0.15	4.5-5.5	Low.
35-60	35-55	30-50	15-30	>6.0	0.04-0.08	4.5-5.5	Low.
98-100	98-100	70-95	36-45	2.0-6.0	0.14-0.16	5.1-6.0	Low.
98-100	98-100	80-90	40-55	0.6-2.0	0.15-0.17	5.1-6.0	Low.
98-100	98-100	70-95	36-45	2.0-6.0	0.14-0.16	5.1-6.0	Low.
95-100	90-100	70-95	55-85	0.6-2.0	0.18-0.22	5.6-6.5	Low.
90-100	90-100	70-95	50-85	0.6-2.0	0.18-0.22	5.6-6.5	Low.
95-100	85-100	65-95	45-85	0.6-6.0	0.12-0.18	5.6-6.5	Low.

TABLE 7.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such mapping that appear in the first

Soil series and map symbols	Suitability as a source of—		
	Topsoil	Sand and gravel	Road fill
Armour: Ar	Fair: thickness of suitable material.	Poor: no sand or gravel	Fair: fair traffic-supporting capacity.
Bodine: BoE	Poor: coarse fragments	Poor: no sand or gravel	Good
Chenneby: Ch	Good	Poor: no sand or gravel	Fair: fair traffic-supporting capacity.
Choccolocco: Co	Fair: thickness of suitable material.	Poor: no sand or gravel	Fair: fair traffic-supporting capacity.
Decatur: DaB, DcC2	Fair: thickness of suitable material; too clayey.	Poor: no sand or gravel	Fair: fair traffic-supporting capacity; moderate shrink-swell potential.
Dewey: DeB, DeC, DfC2	Fair: thickness of suitable material; too clayey.	Poor: no sand or gravel	Fair: fair traffic-supporting capacity; moderate shrink-swell potential.
Dickson: DoA, DoB, DoC	Good	Poor: no sand or gravel	Fair: fair traffic-supporting capacity; low to moderate shrink-swell potential.
Etowah: EtB	Fair: thickness of suitable material.	Poor: no sand or gravel	Fair: fair traffic-supporting capacity.
Fullerton:			
FaB	Poor: coarse fragments; thickness of suitable material.	Poor: no sand or gravel	Good to fair: good to fair traffic-supporting capacity.
FaC	Poor: coarse fragments; thickness of suitable material; slope.	Poor: no sand or gravel	Good to fair: good to fair traffic-supporting capacity.
Grasmere: Gr	Fair: too clayey	Poor: no sand or gravel	Fair to poor: fair to poor traffic-supporting capacity; moderate shrink-swell potential.
Guthrie: Gu	Poor: wetness	Poor: no sand or gravel	Poor: wetness
Humphreys: Hu	Poor: coarse fragments	Poor: no sand or gravel	Good to fair: good to fair traffic-supporting capacity.
Lee: Le	Poor: wetness; coarse fragments.	Poor: no sand or gravel	Poor: wetness
Lobelville: Lo	Poor: coarse fragments	Poor: no sand or gravel	Good to fair: good to fair traffic-supporting capacity.
Paleudults: PaD3. No valid estimate can be made.			
Pruitton: Pr	Fair: coarse fragments	Poor: no sand or gravel	Fair: fair traffic-supporting capacity.
*Saffell:			
SaC	Poor: coarse fragments	Fair to poor: excess fines	Good
SBF For Bodine part, see Bodine series.	Poor: coarse fragements; slope.	Fair to poor: excess fines	Fair to poor: slope
Smithdale: SmC	Fair: thickness of suitable material.	Poor: no sand or gravel	Good
Staser: St	Good	Poor: no sand or gravel	Fair: fair traffic-supporting capacity.

interpretations

units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series column of this table]

Soil features affecting—				
Farm ponds		Agricultural drainage	Terraces and diversions	Grassed waterways
Reservoir areas	Embankments			
Moderate permeability	Fair to good slope stability	Not needed	Not needed: level	Not needed: level.
Moderately rapid permeability.	Fair slope stability	Not needed	Steepness; coarse fragments.	Steepness; low available water capacity.
Moderate permeability	Fair slope stability	Seasonal high water table; subject to flooding; somewhat poorly drained.	Not needed: level; subject to flooding.	Not needed: level.
Moderate permeability	Fair slope stability	Not needed	Not needed: level	Not needed: level.
Moderate permeability	Fair slope stability	Not needed	High erodibility; irregular slopes.	High erodibility; slope.
Moderate permeability	Fair slope stability	Not needed	High erodibility; slope	High erodibility; slope.
Moderate to slow permeability.	Fair slope stability	Seasonal high water table	Slopes of more than 2 percent; moderate erodibility.	Slopes of more than 2 percent; moderate erodibility.
Moderate permeability	Fair slope stability	Not needed	Moderate erodibility; slope.	Moderate erodibility; slope.
Moderate permeability	Fair slope stability	Not needed	Coarse fragments; high erodibility; slope.	Erodibility; slope.
Moderate permeability	Fair slope stability	Not needed	Coarse fragments; slope	Slope.
Moderate permeability	Fair slope stability	Outlets from depressions difficult to find in places.	Not needed: level	Not needed: level.
Slow permeability	Fair slope stability	Seasonal high water table; subject to flooding.	Not needed: level; subject to flooding.	Not needed: level.
Moderately rapid permeability.	Fair slope stability	Not needed	Not needed: level; coarse fragments.	Not needed: level.
Moderate permeability	Fair to good slope stability	Seasonal high water table; subject to flooding.	Not needed: level; subject to flooding; coarse fragments.	Not needed: level; low to moderate available water capacity.
Moderate permeability	Fair slope stability	Seasonal high water table; subject to flooding.	Not needed: level; subject to flooding; coarse fragments.	Not needed: level; low to moderate available water capacity.
Moderately rapid permeability.	Fair to good slope stability	Not needed	Not needed: level	Not needed: level.
Moderate to rapid permeability.	Fair to good slope stability	Not needed	Moderate erodibility; slope; coarse fragments.	Slope; moderate erodibility; low to moderate available water capacity.
Moderate to rapid permeability.	Fair to good slope stability	Not needed	Slope; severe erodibility; coarse fragments.	Slope; severe erodibility; low to moderate available water capacity.
Moderate to moderately rapid permeability.	Fair slope stability	Not needed	Moderate erodibility; slope.	Moderate erodibility; slope.
Moderate to moderately rapid permeability.	Fair to good slope stability	Not needed	Not needed: level	Not needed: level.

Reaction is the degree of acidity or alkalinity of a soil, expressed in pH values. The pH value and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the relative change in volume to be expected of soil material when the moisture content changes; that is, the extent to which the soil shrinks as it dries or swells when it gets wet. Extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. A *high* shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating. Generally, soils classified as CH and A-7 have high shrink-swell potential, and soils classified as SM and A-4 contain only a small amount of clay and have low shrink-swell potential.

Engineering Interpretations

The interpretations in table 7 are based on the estimates of engineering properties of soils shown in table 6, on test data for soils in this survey area and others nearby or adjoining, and on the experience of engineers and soil scientists with the soils of Lauderdale County. In table 7 ratings are used to summarize suitability of the soils for all listed purposes other than for farm pond reservoir areas and embankments, argicultural drainage, terraces and diversions, and grassed waterways. For these particular uses table 7 lists those soil features not to be overlooked in planning, installation, and maintenance. Soil suitability is rated as good, fair, or poor.

Following are explanations of some of the columns in table 7.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by ease of working and spreading the soil material, as for preparing a seedbed; natural fertility of the material, or response of plants when fertilizer is applied; and absence of substances toxic to plants. Texture of the soil material and its content of stone fragments are characteristics that affect suitability. Also considered in the ratings is damage that will result in the area from which topsoil is taken.

Sand and gravel are used in great quantities in many kinds of construction. The ratings in table 7 provide guidance about where to look for probable sources. A soil rated as good or fair generally has a layer of sand or gravel at least 3 feet thick, the top of which is within a depth of 6 feet. The ratings do not take into account thickness of overburden, location of the water table, or other factors that affect mining of the materials. Furthermore, no indication is made concerning quality of the deposit.

Road fill is soil material used in embankments for roads. The suitability ratings reflect (1) the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage and (2) the relative ease of excavating the material at borrow areas.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and also to depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Presence of stones or organic material in a soil are among factors that are unfavorable.

Agricultural drainage is affected by such soil properties as slope, permeability, texture, and structure; depth to claypan, rock, or other layers that influence rate of water movement; depth to the water table; stability in ditchbanks; susceptibility to stream overflow; salinity or alkalinity; and availability of outlets for drainage.

Terraces and diversions are embankments, or ridges, constructed across the slope to intercept runoff so that it soaks into the soil or flows slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock or other unfavorable material; presence of stones; permeability; and resistance to water erosion, soil slipping, and soil blowing. A soil suitable for these structures provides outlets for runoff and is not difficult to vegetate.

Grassed waterways are used to carry runoff in such a way that little or no erosion occurs. Generally, the waterway has to be shaped to proper dimensions and then seeded or sodded with suitable grass and fertilized. Grassed waterways are affected by such features as slope; texture; permeability of soil layers below the surface layer; depth to the water table; depth to clay, bedrock, or hardpan; the presence of stones; the hazard of erosion; and availability of suitable outlets.

Town and Country Planning

Lauderdale County includes part of a four-city area consisting of Florence, Sheffield, Tuscumbia, and Muscle Shoals and is accessible by major highways. Its population is steadily expanding into areas formerly used for farming. Along with this expansion is an increasing demand for housing, shopping centers, schools, parks, and other developments.

This section was prepared mainly for planners, builders, landscape architects, zoning officials, private and potential landowners, and others interested in the use of soils for purposes other than farming. Table 8 shows the degree and kind of limitation of each soil in the county for specified nonfarm purposes.

The suitability of the soils must be determined in selecting a site for a residence, a highway, an industry, a recreational use, or any other nonfarm purpose. Among the important properties considered are texture, reaction, depth, shrink-swell potential, slope, permeability, depth to hard rock and to the water table, and hazard of flooding.

The degrees of limitation shown in table 8 are slight, moderate, and severe. *Slight* means that few or no adjustments are needed. *Moderate* means that some adjustment is needed to make the soil suitable for a specified use. *Severe* means that extensive adjustments are needed.

Flooding, as mentioned in table 8, refers to the hazard of stream overflow or to flooding caused by runoff or seepage. The degree of the limitation caused by flooding expresses

the frequency of flooding and the length of time that water remains on the surface.

In the paragraphs that follow, each nonfarm use is defined, and the properties important in determining the limitations of the soils for such use are given. Information in table 8 can be used along with the information in table 7, with information in other parts of the survey, and with the soil map at the back of the survey as a guide in planning the use of the soils for nonfarm purposes. This information, however, does not eliminate the need for onsite investigation at specific sites.

Residences and low buildings are buildings of no more than three stories. The soil properties considered most important are bearing capacity, shrink-swell potential, depth to seasonal high water table, flooding, slope, and depth to hard rock. The kind of sewage system required is not considered in the evaluation of a soil for a residential site.

Septic tank absorption fields are sewage systems in which waste is distributed to a central tank, and the effluent from the tank is dispersed over a fairly large area of absorption field lines buried in the soil. The properties considered most important in the proper operation of such a system are shrink-swell potential, depth to seasonal high water table, depth to hard rock, hazard of flooding, slope, and percolation rate.

Sewage lagoons consist of an impounded area and an embankment. The main requirements of a soil for use as a floor for the basin of a lagoon are effective sealing against seepage; an even, fairly level surface; and little or no content of organic matter. The most important considerations are permeability, suitability of the soil as a site for a reservoir, suitability of the material at the site of an embankment, depth to hard rock, slope, content of organic matter, and content of coarse fragments. A sewage lagoon should be planned so that no less than 2 feet and no more than 5 feet of liquid is held in the lagoon.

Local roads and streets are low-cost roads and residential streets that require limited cut and fill and subgrade preparation. The most important properties to be considered are slope, depth to hard rock, depth to the water table, hazard of flooding, hazard of erosion, and traffic-supporting capacity.

Sanitary landfill (trench type) is a method of disposing of refuse in dug trenches. The waste is spread in thin layers, compacted, and covered with soil throughout the disposal period. Landfill areas are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfill are ease of excavation, hazard of polluting ground water, and trafficability. The best soils have moderately slow permeability, withstand heavy traffic, and are friable and easy to excavate. Unless otherwise stated, the ratings in table 8 apply only to a depth of about 6 feet. Therefore, limitation ratings of *slight* or *moderate* may not be valid if trenches are deeper than 6 feet. For some soils reliable predictions can be made to a depth of 10 to 15 feet. Nevertheless, every site should be investigated before it is selected.

Among properties considered in determining the suitability of soils for picnic grounds, campsites, intensive play areas, and paths and trails are wetness, depth to the water table, hazard of flooding, slope, depth to hard rock, permeability, and the presence of stone, rocks, and other coarse fragments.

Picnic grounds mainly require good trafficability. It is assumed that little site preparation is needed.

Campsites are areas suitable for tents and small camp trailers and for outdoor dining. Little site preparation is needed except in areas used for tents or for parking. Suitable soils are those that support heavy traffic by vehicles, as well as by campers.

Intensive play areas are used as playgrounds and for baseball, football, tennis, badminton, and other organized games. The soils in these areas should withstand heavy foot traffic.

Paths and trails are used as bridle paths and for cross-country hiking and other nonintensive uses. It is assumed that the soils are to be used as they occur and that little excavation is needed.

Formation and Classification of the Soils

In this section the factors that affected the formation of the soils of Lauderdale County are discussed. The system of classification is also explained, and the soil series are placed in higher categories of the system.

Formation of the Soils

Soil is the product of soil-forming processes acting on materials deposited or accumulated by geologic agencies. The characteristics of the soil at any given point are determined by (1) the composition of the parent material; (2) the climate under which the soil material has accumulated and existed since accumulation; (3) the plant and animal life on and in the soil; (4) the relief, or lay of the land; and (5) the length of time the forces of soil development have acted on the soil material. Climate is very important in soil development because it affects temperature and moisture conditions in the soil.

Climate and vegetation are the active factors in soil genesis. They act on the parent material and change it into a body that has definite soil characteristics. The effects of climate and vegetation on the parent material are conditioned by relief, which influences drainage, the quantity of water that percolates through the soil, the rate of erosion, and the kind of vegetation that grows on the soil. The nature of the parent material also affects the kind of profile that can be formed. Time is needed for changing the parent material into soil. Usually a long interval is required for the development of distinct soil horizons.

The factors of soil formation are so closely associated in their effects on the soil that few generalizations can be made regarding the effects of any one factor alone. The interrelationship of the factors is so complex that many of the processes of soil development are not known.

Soils that formed in unconsolidated beds of sand, clay, and gravel of the Tuscaloosa (*1*) Formation are not directly associated with any one rock formation. Some beds are known to be 100 feet thick. They are probably a residue or conglomerate of several rock formations. The Saffell and Smithdale soils are generally associated with sandier parts of the Tuscaloosa Formation.

Soils that weathered in place consist of residuum from

TABLE 8.—*Soil limitations for*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in such mapping that appear in the first

Soil series and map symbols	Degree and kind of limitation for—			
	Residences and low buildings	Septic tank absorption fields	Sewage lagoons	Local roads and streets
Armour: Ar	Moderate: fair bearing strength.	Slight	Moderate: moderate permeability.	Moderate: fair traffic-supporting capacity.
Bodine: BoE	Moderate where slopes are 10 to 15 percent. Severe where slopes are 15 to 35 percent.	Moderate where slopes are 10 to 15 percent. Severe where slopes are 15 to 35 percent.	Severe: slope; moderately rapid permeability.	Moderate where slopes are 10 to 15 percent. Severe where slopes are 15 to 35 percent.
Chenneby: Ch	Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding; seasonal high water table.	Moderate: moderate permeability.	Severe: subject to flooding.
Choccolocco: Co	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; moderately rapid permeability in lower part.	Severe: subject to flooding.
Decatur:				
DaB	Moderate: fair bearing strength; moderate shrink-swell potential.	Slight	Moderate: moderate permeability; slope.	Moderate: fair traffic-supporting capacity; moderate shrink-swell potential.
DcC2	Moderate: slope; fair bearing strength; moderate shrink-swell potential.	Slight to moderate: slope	Severe: slope	Moderate: fair traffic-supporting capacity; moderate shrink-swell potential.
Dewey:				
DeB	Moderate: fair bearing strength; moderate shrink-swell potential.	Slight	Moderate: slope; moderate permeability.	Moderate: fair traffic-supporting capacity; moderate shrink-swell potential.
DeC	Moderate: slope; fair bearing strength; moderate shrink-swell potential.	Slight to moderate: slope	Severe: slope	Moderate: slope; fair traffic-supporting capacity; moderate shrink-swell potential.
DfC2	Moderate: slope; fair bearing strength; moderate shrink-swell potential.	Slight to moderate: slope	Severe: slope	Moderate: slope; fair traffic-supporting capacity; moderate shrink-swell potential.
Dickson:				
DoA	Moderate: fair bearing strength; seasonal high water table.	Severe: slow permeability; seasonal high water table.	Slight	Moderate: fair traffic-supporting capacity.
DoB	Moderate: fair bearing strength; seasonal high water table.	Severe: slow permeability; seasonal high water table.	Moderate: slope	Moderate: fair traffic-supporting capacity.
DoC	Moderate: fair bearing strength; slope; seasonal high water table.	Severe: slow permeability; seasonal high water table.	Severe: slope	Moderate: slope; moderate traffic-supporting capacity.
Etowah: EtB	Moderate: fair bearing strength.	Slight	Moderate: moderate permeability; slope.	Moderate: fair traffic-supporting capacity.
Fullerton:				
FaB	Slight	Slight	Moderate: moderate permeability; slope.	Slight to moderate: good to fair traffic-supporting capacity.
FaC	Moderate: slope	Slight to moderate: slope	Severe: slope	Moderate: slope; good to fair traffic-supporting capacity.
Grasmere: Gr	Severe: subject to flooding.	Severe: subject to flooding.	Slight	Severe: subject to flooding.
Guthrie: Gu	Severe: seasonal high water table; subject to flooding.	Severe: slow permeability; seasonal high water table.	Slight	Severe: wetness; subject to flooding.
Humphreys: Hu	Slight to moderate: good to fair bearing strength.	Slight	Severe: moderately rapid permeability.	Slight to moderate: good to fair traffic-supporting capacity.
Lee: Le	Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding; wetness.

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units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for referring to other series column of this table]

Degree and kind of limitation for—Continued				
Sanitary landfill [1] (trench-type)	Picnic grounds	Campsites	Intensive play areas	Paths and trails
Severe: depth to bedrock	Slight	Slight	Slight	Slight.
Severe: moderately rapid permeability; slope.	Moderate where slopes are 10 to 15 percent: coarse fragments. Severe where slopes are 15 to 35 percent.	Moderate where slopes are 10 to 15 percent: coarse fragments. Severe where slopes are 15 to 35 percent.	Severe: slope; coarse fragments.	Moderate where slopes are 10 to 25 percent: coarse fragments. Severe where slopes are 25 to 35 percent.
Severe: subject to flooding.	Moderate: wetness; subject to flooding.	Severe: subject to flooding; wetness.	Severe: subject to flooding; wetness.	Moderate: wetness; subject to flooding.
Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Slight.
Severe: too clayey	Slight	Slight	Moderate: slope	Slight.
Severe: too clayey	Moderate: slope; too clayey.	Moderate: slope; too clayey.	Severe: slope	Moderate: too clayey.
Severe: too clayey	Slight	Slight	Moderate: slope	Slight.
Severe: too clayey	Moderate: slope	Moderate: slope	Severe: slope	Slight.
Severe: too clayey	Moderate: slope; too clayey.	Moderate: slope; too clayey.	Severe: slope	Moderate: too clayey.
Severe: seasonal high water table.	Slight	Slight	Slight	Slight.
Severe: seasonal high water table.	Slight	Slight	Moderate: slope	Slight.
Severe: seasonal high water table.	Moderate: slope	Moderate: slope	Severe: slope	Slight.
Moderate: too clayey	Slight	Slight	Moderate: slope	Slight.
Moderate: too clayey	Moderate: coarse fragments.	Moderate: coarse fragments.	Severe: coarse fragments.	Moderate: coarse fragments.
Moderate: too clayey	Moderate: coarse fragments; slope.	Moderate: coarse fragments; slope.	Severe: coarse fragments; slope.	Moderate: coarse fragments.
Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.
Severe: subject to flooding; wetness.	Severe: subject to ponding or flooding; wetness.	Severe: subject to ponding or flooding; wetness.	Severe: wetness; subject to ponding or flooding.	Severe: wetness; subject to ponding or flooding.
Severe: moderately rapid permeability.	Slight	Slight	Moderate: coarse fragments.	Slight.
Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding; wetness.	Severe: subject to flooding; wetness.	Severe: subject to flooding; wetness.	Severe: subject to flooding; wetness.

TABLE 8.—*Soil limitations for*

Soil series and map symbols	Degree and kind of limitation for—			
	Residences and low buildings	Septic tank absorption fields	Sewage lagoons	Local roads and streets
Lobelville: Lo	Severe: subject to flooding.	Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding.
Paleudults: PaD3. No valid estimate can be made.				
Pruitton: Pr	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.
*Saffell:				
SaC	Moderate: slope	Slight to moderate: slope	Severe: slope; rapid permeability in lower part of the subsoil and the underlying material.	Slight to moderate: slope
SBF For Bodine part, see Bodine series	Moderate where slopes are 10 to 15 percent. Severe where slopes are 15 to 35 percent.	Moderate where slopes are 10 to 15 percent. Severe where slopes are 15 to 35 percent.	Severe: slope; rapid permeability in lower part of the subsoil and the underlying material.	Moderate where slopes are 10 to 15 percent. Severe where slopes are 15 to 35 percent.
Smithdale: SmC	Slight to moderate: slope	Slight to moderate: slope	Severe: moderately rapid permeability in lower part of the subsoil.	Slight to moderate: slope
Staser: St	Severe: subject to flooding.	Severe: subject to flooding.	Moderate: moderate to moderately rapid permeability.	Severe: subject to flooding.

[1] Onsite studies of the underlying strata, water table, and hazards of aquifer pollution and drainage into ground water should be made for landfill deeper than 5 or 6 feet.

the consolidated sedimentary rock. In Lauderdale County these rocks are limestone. Geologically, the rocks are very old. They were laid down originally as unconsolidated sediment and were gradually converted into consolidated rock.

The kinds of transported parent materials are reflected in some of the characteristics of the soils derived from them. Some of the soils formed in general alluvium that washed mainly from soil material weathered from limestone, with some influence from sandstone and shale. They are the Etowah and Humphreys soils on stream terraces; the much younger Pruitton, Lobelville, and Lee soils on flood plains; and the local alluvial Grasmere soils.

Parent material

Parent material is the unconsolidated mass in which a soil formed. It is largely responsible for the chemical and mineralogical composition of soils. In Lauderdale County the soil material may be grouped into three classes: (1) material that is residual from the weathering of rock in place; (2) material that is residual from the weathering of unconsolidated beds of sand, silt, and clay of the Coastal Plain; and (3) material transported by water or gravity and laid down as unconsolidated deposits of sand, silt, clay, and gravel.

Residual parent material is from sedimentary rocks, mainly limestone, sandstone, and shale. Geologically, the rocks are very old. They were laid down originally as unconsolidated sediment and were gradually converted into consolidated rock. Their age ranges from Silurian through Mississippian. The age of the Coastal Plain material is Cretaceous.

Similar soils are generally associated with a particular rock formation. Decatur and Dewey soils are related to limestone of the Warsaw and St. Louis Formations (*1*). Fullerton, Dickson, and Bodine soils are from cherty limestones of the Fort Payne (Lauderdale) Chert Formation. Saffell and Smithdale soils are from unconsolidated beds of sand, silt, and clay (Tuscaloosa Formation) of the Coastal Plain.

Climate

Climate, as a factor of soil formation, affects the physical, chemical, and biological relationships in the soil mainly through the influence of precipitation and temperature. Water dissolves minerals, supports biological activity, and transports mineral and organic residue through the soil profile. The amount of water that actually percolates through the soil over a broad area is dependent mainly upon rainfall, relative humidity, and the length of the frost-free period. The amount of downward percolation is also affected by the physiographic position and permeability of the soil. Temperature influences the kinds and growth of organisms and the speed of physical and chemical reactions in the soils. Microclimatic variation causes certain characteristics of the soils to differ from those developed under the prevailing macroclimate.

Under the present climate in Lauderdale County, the soils are moist and subject to leaching much of the time from November 1 through June 30; they are moderately dry to dry much of the time from August 31 through October 31; and they are frozen for only 1 to 4 days at a time. Freezing and thawing in this county have some effect on

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Degree and kind of limitation for—Continued				
Sanitary landfill [1] (trench-type)	Picnic grounds	Campsites	Intensive play areas	Paths and trails
Severe: subject to flooding; seasonal high water table.	Moderate: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding; coarse fragments.	Slight.
Severe: subject to flooding.	Moderate: subject to flooding.	Moderate: subject to flooding.	Moderate: subject to flooding.	Slight.
Severe: rapid permeability in lower part of the subsoil and the underlying material.	Moderate: slope; coarse fragments.	Moderate: slope; coarse fragments.	Severe: slope; coarse fragments.	Slight to moderate: coarse fragments.
Severe: rapid permeability in lower part of the subsoil and the underlying material.	Moderate where slopes are 10 to 15 percent: coarse fragments. Severe where slopes are 15 to 35 percent: coarse fragments.	Moderate where slopes are 10 to 15 percent: coarse fragments. Severe where slopes are 15 to 35 percent: coarse fragments.	Severe: slope; coarse fragments.	Moderate to severe where slopes are 10 to 15 percent: coarse fragments. Severe where slopes are 15 to 35 percent: coarse fragments.
Severe: moderately rapid permeability in lower part of the subsoil.	Slight to moderate: slope.	Slight to moderate: slope.	Severe: slope	Slight.
Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Slight.

weathering and soil-forming processes. The climate is uniform throughout the county; therefore, differences among the soils are not the result of climate.

Plant and animal life

Trees, shrubs, grasses and other herbaceous plants, micro-organisms, earthworms, and various other forms of plant and animal life on and in the soil are the active agents in the soil-forming processes. The kinds of plants and animals that live on and in the soil are determined by environmental factors, which include climate, parent material, relief, age of soil, and organisms.

Not much is known of the fungi and micro-organisms in the soils of this county except that they are largely confined to the uppermost few inches of soil material. The earthworms and small invertebrates are most active in the surface layer, where they carry on a slow but continuous cycle of soil mixing.

Bacteria, fungi, and other micro-organisms aid in the weathering of rock and decomposing organic matter. The larger plants supply organic matter and transfer elements from the subsoil to the surface soil.

The native vegetation on the well-drained, well-developed soils on uplands was dominantly deciduous hardwoods, mainly oak, hickory, and chestnut mixed with some pines. On the bottom lands the trees were lowland hardwoods, mainly yellow-poplar, sweetgum, ash, oak, and sycamore. On the poorly drained bottom lands the trees were mainly willow, birch, blackgum, beech, water oaks, and willow oaks.

Relief

The relief is determined largely by the underlying bedrock formations, the geological history of the region, and the effects of dissection by streams. It influences soil formation by affecting internal drainage, runoff, rate of erosion, and other results of water action. The influence of relief is modified by the other four factors of soil formation.

Slopes in Lauderdale County range from 0 to 35 percent. In upland areas where slopes are 10 percent or less, such soils as Decatur and Dewey soils have thick, well-expressed profiles. Where slopes are 10 to 35 percent, geological erosion generally removes the soil material almost as fast as it forms; however, Saffell and Bodine soils that have steeper slopes also have well-developed profiles.

Time

The length of time required for soil formation depends largely on the other factors of soil formation. Less time is generally needed for a soil to develop in humid, warm regions with luxuriant vegetation than in dry or cold regions with scanty vegetation.

The age of soils varies considerably. Soil material that has been in place for only a short time has not been influenced long enough by climate and vegetation to have formed well-defined and genetically related profile horizons. Most of the soils on first bottoms are composed of such material. Soil material in areas where slopes are steep is constantly being renewed and removed by erosion. Generally, soils that formed in this material have not devel-

oped genetically related horizons. These two broad groups of soils are the young soils of the county.

Soils that have been in place for a long time and have approached equilibrium with their environment are considered mature or old. Some nearly level, well-drained soils that are only slightly eroded have more strongly marked profile characteristics than the well-drained, well-developed sloping soils on uplands. The soils of Lauderdale County range in age from young to very old.

Classification of the Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories, so that information can be applied to large geographic areas.

The system of classification that is currently used by the National Cooperative Soil Survey was developed in the early sixties (*5*) and was adopted in 1965 (*9*). It is under continual study.

The current system of classification has six categories. Beginning with the most inclusive, these categories are 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 Lauderdale County by family, subgroup, and order, according to the current system.

Following are brief descriptions of each of the categories of the current system.

Order.—Ten soil orders are recognized. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate these soil orders are those that tend to give broad climatic groupings of soils. Two exceptions are Entisols and Histosols, which occur in many different climates. The name of each order has three or four syllables ending in *sol* (Ult-i-sol). The five orders in Lauderdale County are Alfisols , Ultisols, Inceptisols, Entisols, and Mollisols.

Alfisols have relatively low organic-matter content and relatively high base saturation.

Ultisols have a clay-enriched B horizon. Their base saturation is less than 35 percent, and it decreases as depth increases.

Inceptisols generally form on young, but not recent, land surfaces. These soils have weakly developed or incipient horizons.

Entisols are recent mineral soils that do not have genetic horizons or have only the beginning of such horizons.

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

Suborder.—Each order is divided into suborders, primarily on the basis of soil characteristics that seem to produce classes that have the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of waterlogging or soil differences that result from the climate or vegetation. The name of each suborder has two syllables. The last syllable indicates the order. An example is *Udult* (*Ud*, meaning humid climate, and *ult*, from Ultisol).

Great Group.—Each suborder is divided into great groups on the basis of uniformity in the kind and sequence of major soil horizons and features. The horizons used to

TABLE 9.—*Classification of soil series* [1]

Series	Family	Subgroup	Order
Armour	Fine-silty, mixed, thermic	Ultic Hapludalfs	Alfisols.
Bodine	Loamy-skeletal, siliceous, thermic	Typic Paleudults	Ultisols.
Chenneby	Fine-silty, mixed, thermic	Fluvaquentic Dystrochrepts	Inceptisols.
Choccolocco	Fine-silty, mixed, thermic	Typic Hapludults	Ultisols.
Decatur	Clayey, kaolinitic, thermic	Rhodic Paleudults	Ultisols.
Dewey	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Dickson	Fine-silty, siliceous, thermic	Glossic Fragiudults	Ultisols.
Etowah	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Fullerton	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Grasmere [2]	Fine, mixed, thermic	Cumulic Haplumbrepts	Inceptisols.
Guthrie	Fine-silty, siliceous, thermic	Typic Fragiaquults	Ultisols.
Humphreys	Fine-loamy, siliceous, thermic	Humic Hapludults	Ultisols.
Lee	Fine-loamy, siliceous, acid, thermic	Typic Fluvaquents	Entisols.
Lobelville	Fine-loamy, siliceous, thermic	Fluvaquentic Dystrochrepts	Inceptisols.
Pruitton	Fine-loamy, siliceous, thermic	Fluventic Dystrochrepts	Inceptisols.
Saffell	Loamy-skeletal, siliceous, thermic	Typic Hapludults	Ultisols.
Smithdale	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Staser	Fine-loamy, mixed, thermic	Cumulic Hapludolls	Mollisols.

[1] These soils were classified in August, 1973.

[2] The Grasmere soils in Lauderdale County are taxadjuncts to the Grasmere series. They contain slightly less than 35 percent clay in the control section, but use, management, and behavior are not altered and are similar to those of soils of the Grasmere series.

make divisions are those in which clay, iron, or humus have accumulated; those that have pans that interfere with growth of roots, movement of water, or both; and those that have thick, dark-colored surface horizons. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark-red and dark-brown colors associated with basic rocks, and the like. The name of a great group has three or four syllables and is made by adding a prefix to the name of the suborder. An example is Hapludults (*Hapl*, meaning simple horizons, *ud* for humid climate, and *ult*, from Ultisols).

Subgroup.—Each great group is divided into subgroups, one representing the central (typic) segment of the group, and others, called intergrades, that have properties of the group and also one or more properties of another great group, suborder, or order. A subgroup may also be made in those instances where soil properties intergrade outside the range of any other great group, suborder, or order. The name of a subgroup is derived by placing one or more adjectives before the name of the great group. An example is Typic Hapludults (a typical Hapludult).

Family.—Soil families are separated within a subgroup primarily on the basis of properties important to the growth of plants or on the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for texture, mineralogy, and so on, that are used as family differentiae (table 9). An example is the fine-silty, mixed, thermic family of Typic Hapludults.

Series.—The series has the narrowest range of characteristics of the categories in the classification system. It is explained in the section "How This Survey Was Made."

A detailed description of each soil series in the county is given in the section "Description of the Soils."

General Nature of the County

This section discusses relief, drainage, and water supply; farming; and climate in the area covered by this soil survey.

Relief, Drainage, and Water Supply

The general slope of the county is southward. Elevation ranges from about 414 feet above sea level, near the confluence of Cypress Creek and the Tennessee River, to about 900 feet above sea level, about 1½ miles north of Murphy's Chapel Church near the State line. Most of the county is 500 to 800 feet above sea level.

The Tennessee and Elk Rivers are the major streams in the county. The Elk River empties into the Tennessee in the southeastern part of the county. Cypress, Shoal, Anderson, Second, and Bluewater are some of the larger creeks. Most of them flow generally in a southerly direction and empty into the Tennessee River, but Anderson Creek empties into the Elk River.

The water supply is adequate for domestic use in all parts of the county. Most of the small streams dry up late in summer and in fall. Domestic water for most rural homes is obtained from drilled wells, but public water systems have been established in several rural communities. Ponds have been built on many farms to furnish water for livestock and for fishing (fig. 14). About 2,100 farm ponds are in the county.

Farming

According to the Census of Agriculture, 1,874 farms were in the county in 1969. Of these, 1,351 were operated by full owners, 357 by part owners, and 166 by tenants. About 57 percent of the county, or 247,887 acres, was in farms. Crops were harvested from about 22 percent of the farmland, and about 25 percent of the farmland was used for pasture.

Cotton, soybeans, corn, and wheat are the principal crops grown in the county. Cotton is the main cash crop. In recent years the acreage of cotton and corn has decreased, but good management practices, increased use of fertilizer, and use of improved varieties of plants have helped to increase the yields per acre.

About 67 percent of the farm income in the county comes from the sale of livestock, poultry, and their products.

Climate [6]

The climate of Lauderdale County is temperate. Rainfall is abundant and generally is well distributed. Severe temperature extremes are rare (table 10).

Summers are marked by warm temperatures and high humidity, beginning in May and continuing into September. Cold fronts do not reach the area very often in summer, so that breaks from the heat and humidity are very few.

In an average summer the temperature reaches or exceeds 90° F on about 67 days, but 100° temperatures occur on only about 4 days. It is not too unusual for the temperature to fail to reach 100° a single time for two or three summers in a row.

The first cool weather usually arrives late in September or early in October, and the heat and humidity of summer give way to Indian summer and fall. This is by far the most pleasant season of the year. This period lasts from about late September into November. During this time rainfall is lighter, humidity is lower, and the percentage of sunshine is higher than at other times. Also during this time, the chances of extended periods of uninterrupted fair, dry weather are increased.

Winters are not severely cold and are relatively short. The temperature drops to freezing or lower on about 57 days, but long term records at Decatur (table 11) show that lows of zero or below can be expected roughly one winter in nine. The first 32° weather arrives about the first of November.

Records at Muscle Shoals, in adjacent Colbert County, show that in the average growing season, the number of days between the last 32° low in spring and the first in fall is 224.

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[6] By ROBERT M. FERRY, climatologist for Alabama, National Weather Service, U.S. Department of Commerce.

***Figure 14.*—One of many farm ponds in the county. The pond is stocked with catfish and supplies water for livestock.**

TABLE 10.—*Temperature and precipitation*

[Temperature data from Muscle Shoals, Colbert County. Precipitation data from Florence, Lauderdale County; Muscle Shoals, Colbert County; and Belgreen, Franklin, County]

Month	Temperature				Precipitation			
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average monthly total	One year in 10 will have—		Average total snowfall
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—	
	°F	°F	°F	°F	Inches	Inches	Inches	Inches
January	52	34	71	15	5.8	2.2	12.0	0.9
February	54	36	71	18	6.1	1.9	11.6	.8
March	61	41	79	25	5.5	2.7	10.7	.3
April	73	51	84	33	4.6	2.3	8.1	(1)
May	81	59	89	46	3.3	1.0	5.9	(1)
June	88	67	95	56	3.2	1.2	5.3	0
July	91	70	95	61	4.5	1.3	9.2	0
August	90	69	96	60	3.1	.8	7.5	0
September	84	62	92	50	2.7	.9	5.1	0
October	74	51	86	36	2.0	.7	5.6	(1)
November	61	40	77	23	4.0	.8	9.8	.2
December	53	34	68	16	4.7	2.5	9.9	.5
Year	72	51	97 [2]	9 [3]	49.5	39.0	66.5	2.7

[1] Trace. [2] Average annual maximum. [3] Average annual minimum.

TABLE 11.—*Average dates of stated freezing temperatures and length of freeze-free period*

[Data recorded at Decatur, Morgan County; period of record, 64 years]

Temperature	Last occurrence in spring	First occurrence in fall	Length of freeze-free period
			Days
32 °F or lower	March 25	November 6	226
28 °F or lower	March 11	November 17	250
24 °F or lower	February 25	November 30	278
20 °F or lower	February 12	December 13	304

Lauderdale County can expect several days with snow flurries in an average winter, but a snowfall heavy enough to remain on the ground more than 1 or 2 days is unusual. A notable exception was a New Year's Eve snowfall that deposited 19.7 inches in Florence by the morning of January 1, 1964. Of that amount, 19.2 inches fell within 24 hours. This was the most ever recorded in the State of Alabama during a 24-hour period.

The mean annual snowfall in Lauderdale County is slightly less than 3 inches, but the actual amount is highly unpredictable in any given year. Several years in succession with no measurable snowfall may precede a year in which a major snowstorm occurs. Prior to the 1963 storm, a major snowfall occurred in 1960. On the morning of February 13, snow depths ranged from 4 inches in the northwestern part of the county to more than 12 inches in the southeastern part.

The lowest temperature every recorded in Lauderdale County was 11° below zero on February 13, 1899, at Florence. It was 9° below zero on February 26, 1940, and 8° below on January 31, 1966.

It is possible that parts of eastern Lauderdale County were colder than 11° below zero on the morning of January 31, 1966. Although recorded lows in the Muscle Shoals-Florence-Waterloo area were 5° to 8° below zero, it was 17° below at Athens, 19° below at Belle Mina in adjacent Limestone County, and 24° below at Russellville in Franklin County.

Spring is the most changeable and stormy season. In March the days may change quickly from mild to cold and blustery, but by May they usually settle down to a warm, pleasant routine.

The chances of damaging windstorms or tornadoes are greater in spring, especially in March and April, than at any other time of the year. However, even in this peak storm season, the probability of any one farm or home being struck is extremely slight. While tornadoes are more commonly associated with spring, they can occur in any month of the year.

Generally, the last 32° temperature in spring occurs about the last week of March, but this can vary greatly from year to year.

In an average year any one location in Lauderdale County will receive measurable rain (.01 inch or more) on about 108 days. Eighty days will have 0.10 inch or more, and 34 days will have 0.50 inch or more.

Most of the rainfall in the summer falls during thunderstorms, especially in June, July, and August. Thunderstorms occur on about 28 days of that period.

One of the most severe droughts on record in Lauderdale County occurred in 1924. At Florence a mere 2.18 inches of rain fell over a span of 119 days, from August 8 to December 4. The normal rainfall for that period is about 13.25 inches. No rain fell during October. It was also very dry in the area in 1954, when most of the rest of Alabama was suffering the most severe drought in history. At Muscle Shoals, during this period, only 3.83 inches fell from June through August, a deficiency of 9.12 inches.

Lauderdale County is subject to a partial drought roughly once or twice every 10 years. Severe droughts are less frequent.

A drought occurs when there is no water in the soil available to plants. A drought day is a day during which no water is available to plants. The frequency and severity of drought depends on the capacity of the soil to hold available moisture, on the amount and distribution of precipitation, and on the amount of water used or transpired by the plants. Even in a normal year, there are periods when rainfall does not supply the water needs of most crops, and in which supplementary irrigation might be needed for maximum crop production. During a severe drought, however, the supply of water for irrigation may be limited or nonexistent.

Evapotranspiration is the removal of water from the soil by evaporation and plant transpiration. The rate of evapotranspiration in Lauderdale County is highest in summer, mainly in June and July. It is lowest in winter.

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

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

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

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

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

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Forest type. A term used to describe stands that are similar in composition and development because of ecological factors. A forest type is temporary if its character has been caused by logging, fire, or other passing influences; it is permanent if no appreciable change is expected and its character is the result of ecological factors alone.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

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.

Gravelly soil material. From 15 to 50 percent of material, by volume, consists of rounded fragments that are not prominently flattened and are as much as 3 inches in diameter.

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

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

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

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, which is movement of water through soil layers or material.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to relatively level plots surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops, or in orchards, to confine the flow of water to one direction.

Furrow.—Water is applied in small ditches made by cultivation implements used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Irrigation water, released at high points, flows onto the field without controlled distribution.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

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

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that 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 a soil that range in diameter 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.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

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

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles) adhering together without any regular cleavage, as in many claypans and hardpans).

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

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the description of the soil series to which the mapping unit belongs. In referring to a capability unit or woodland group, read the introduction to the section it is in for general information about its management.

Map symbol	Mapping unit	Page	Capability unit	Woodland suitability group	
			Symbol	Symbol	Page
Ar	Armour silt loam	7	I-46	2o7	25
BoE	Bodine cherty silt loam, 10 to 35 percent slopes	8	VIIs-43	3f8	27
Ch	Chenneby silt loam	9	IIIw-42	1w8	25
Co	Choccolocco silt loam	9	I-46	2o7	25
DaB	Decatur silt loam, 2 to 6 percent slopes	10	IIe-41	3o7	27
DcC2	Decatur silty clay loam, 6 to 10 percent slopes, eroded	10	IVe-411	4c3e	27
DeB	Dewey silt loam, 2 to 6 percent slopes	11	IIe-41	3o7	27
DeC	Dewey silt loam, 6 to 10 percent slopes	11	IIIe-41	3o7	27
DfC2	Dewey silty clay loam, 6 to 10 percent slopes, eroded	11	IVe-411	4c3e	27
DoA	Dickson silt loam, 0 to 2 percent slopes	12	IIw-49	3o7	27
DoB	Dickson silt loam, 2 to 6 percent slopes	12	IIe-49	3o7	27
DoC	Dickson silt loam, 6 to 10 percent slopes	12	IIIe-49	3o7	27
EtB	Etowah silt loam, 2 to 8 percent slopes	13	IIe-42	2o7	25
FaB	Fullerton cherty silt loam, 2 to 6 percent slopes	13	IIe-41	3o7	27
FaC	Fullerton cherty silt loam, 6 to 15 percent slopes	13	IIIe-41	3o7	27
Gr	Grasmere silty clay loam	14	IIw-41	1o7	25
Gu	Guthrie silt loam	15	IVw-49	2w9	27
Hu	Humphreys cherty silt loam	16	IIs-46	2o7	25
Le	Lee cherty silt loam	17	IIIw-42	2w9	27
Lo	Lobelville cherty silt loam	18	IIIw-42	2w8	27
PaD3	Paleudults, 6 to 15 percent slopes, severely eroded	18	VIIe-411	4c3e	27
Pr	Pruitton silt loam	19	I-42	2o7	25
SaC	Saffell gravelly fine sandy loam, 6 to 10 percent slopes	20	IIIe-13	4f2	27
SBF	Saffell and Bodine soils, steep	20	--------	----	--
	Saffell part	--	VIIs-13	4f2	27
	Bodine part	--	VIIs-43	3f8	27
SmC	Smithdale fine sandy loam, 5 to 10 percent slopes	21	IIIe-12	3o1	27
St	Staser silt loam	21	I-46	2o7	25

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