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# SOIL SURVEY

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# Henderson County Tennessee

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UNITED STATES DEPARTMENT OF AGRICULTURE  
Soil Conservation Service  
In cooperation with  
TENNESSEE AGRICULTURAL EXPERIMENT STATION  
TENNESSEE VALLEY AUTHORITY

## HOW TO USE THE SOIL SURVEY REPORT

**T**HIS SURVEY of Henderson County will help in planning the kind of farming that will protect your soils and provide good yields. It describes the soils; shows their location on a map; and tells what they will do under different kinds of management.

### Find your farm on the map

In using this survey, start with the soil map bound in the back of this report. The map sheets, if laid together, make a large photographic map of the county as it looks from an airplane. You can see woods, fields, roads, rivers, and many other landmarks on this map.

To find your farm on the large map, use the index guide to map sheets. This is a small map of the county on which numbered rectangles have been drawn. Each rectangle corresponds to a sheet of the large map.

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

Suppose you have found on your farm an area marked with the symbol 1a. You learn the name of the soil this symbol represents by looking at the map legend. The symbol 1a identifies Ina fine sandy loam.

### Learn about the soil on your farm

Ina fine sandy loam and all the other soils mapped are described in the section, Soil Descriptions. Soil scientists described and mapped the soils as they walked over the fields and through the woodlands. They dug holes and examined the surface soils and sub-

soils; measured slopes with a hand level; noted differences in growth of crops, weeds, brush, or trees; and, in fact, recorded all the things about the soils that they believed might affect their suitability for farming.

After they had mapped and studied the soils, the scientists talked with farmers and others about the use and management each soil should have. They then placed it in a capability unit. A capability unit is a group of similar soils that need and respond to about the same kind of management.

Ina fine sandy loam is in capability unit IIIw-2. Turn to the section, Management, Yields, and Capability, and read what is said about the soils of capability unit IIIw-2. You will want to study table 4, which tells you how much you can expect to harvest from Ina fine sandy loam under two levels of management.

### Make a farm plan

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

If you find that you need help in farm planning, consult the local representative of the Soil Conservation Service. The county agricultural agent and members of your State experiment staff also will be glad to help you.

Fieldwork for this survey was completed in 1954. Unless otherwise specifically mentioned, all statements in this report refer to conditions in the county at that time.

## Contents

	Page		Page
General nature of the area.....	1	Soil descriptions—Continued	
Location and extent.....	1	Dulac-Cuthbert soils:	
Physiography, geology, relief, and drainage...	1	Severely eroded strongly sloping phases.....	18
Climate.....	2	Moderately steep phases.....	19
Water supply.....	2	Dulac and Tippah silt loams:	
Organization and population.....	2	Gently sloping phases.....	19
Industries.....	3	Eroded gently sloping phases.....	20
Transportation and markets.....	3	Sloping phases.....	20
Agriculture.....	3	Eroded sloping phases.....	21
Agricultural history.....	3	Dulac and Tippah silty clay loams:	
Land use and size of farms.....	3	Severely eroded gently sloping phases.....	21
Types of farms.....	3	Severely eroded sloping phases.....	22
Crops.....	3	Severely eroded strongly sloping phases.....	22
Rotations and amendments.....	4	Freeland fine sandy loam, eroded gently sloping phase.....	22
Livestock.....	4	Freeland fine sandy clay loam, severely eroded sloping phase.....	23
Pasture.....	4	Freeland silt loam:	
Farm tenure.....	4	Eroded gently sloping phase.....	23
Farm power and mechanical equipment.....	5	Severely eroded gently sloping phase.....	23
How a soil survey is made.....	5	Eroded sloping phase.....	24
Soil associations.....	5	Severely eroded sloping phase.....	24
1. Ina-Beechy-Hymon association.....	6	Severely eroded strongly sloping phase.....	25
2. Ruston-Lexington association.....	6	Gullied land:	
3. Lexington-Ruston association.....	6	Moderately gullied land:	
4. Shubuta-Cuthbert association.....	6	Cuthbert-Silerton materials.....	25
5. Dulac-Tippah-Cuthbert association.....	7	Lexington-Ruston materials.....	25
6. Ruston-Shubuta-Silerton association.....	7	Severely gullied land:	
Soil series and their relations.....	7	Cuthbert-Silerton materials.....	25
Soils of the uplands.....	7	Lexington-Ruston materials.....	26
Soils developed in loess.....	7	Hatchie silt loam, gently sloping phase.....	26
Soils developed chiefly in Coastal Plain sands and clays.....	7	Hymon fine sandy loam.....	26
Soils of the terraces.....	7	Hymon fine sandy loam, local alluvium phase.....	27
Soils of the bottom lands and local alluvial lands.....	8	Hymon silt loam.....	27
Soil descriptions.....	8	Hymon silt loam, local alluvium phase.....	27
Almo silt loam.....	8	Ina fine sandy loam.....	28
Beechy silt loam.....	8	Ina fine sandy loam, local alluvium phase.....	28
Beechy fine sandy loam.....	10	Ina loamy fine sand, local alluvium phase.....	28
Calloway silt loam:		Ina silt loam.....	29
Gently sloping phase.....	10	Ina silt loam, local alluvium phase.....	29
Eroded gently sloping phase.....	10	Lexington silt loam:	
Cuthbert-Silerton soils:		Eroded gently sloping phase.....	29
Sloping phases.....	11	Sloping phase.....	30
Severely eroded sloping phases.....	11	Eroded sloping phase.....	30
Strongly sloping phases.....	11	Lexington silty clay loam:	
Severely eroded strongly sloping phases.....	12	Severely eroded gently sloping phase.....	31
Moderately steep phases.....	12	Severely eroded sloping phase.....	31
Severely eroded moderately steep phases.....	13	Severely eroded strongly sloping phase.....	31
Dexter fine sandy loam:		Lexington-Ruston soils:	
Eroded gently sloping phase.....	13	Sloping phases.....	32
Eroded sloping phase.....	13	Eroded sloping phases.....	32
Dexter fine sandy clay loam:		Severely eroded sloping phases.....	32
Severely eroded gently sloping phase.....	14	Strongly sloping phases.....	33
Severely eroded sloping phase.....	14	Severely eroded strongly sloping phases.....	33
Dexter silt loam:		Moderately steep phases.....	33
Eroded gently sloping phase.....	14	Severely eroded moderately steep phases.....	34
Sloping phase.....	15	Providence silt loam:	
Dexter silty clay loam, severely eroded sloping phase.....	15	Eroded gently sloping phase.....	34
Dulac silt loam:		Severely eroded gently sloping phase.....	34
Eroded gently sloping deep phase.....	15	Sloping phase.....	35
Sloping deep phase.....	16	Eroded sloping phase.....	35
Eroded sloping deep phase.....	16	Severely eroded sloping phase.....	36
Strongly sloping deep phase.....	17	Severely eroded strongly sloping phase.....	36
Dulac silty clay loam:		Ruston fine sandy loam:	
Severely eroded gently sloping deep phase.....	17	Sloping phase.....	36
Severely eroded sloping deep phase.....	17	Moderately steep phase.....	37
Severely eroded strongly sloping deep phase.....	18	Steep phase.....	37

	Page		Page
Soil descriptions—Continued		Management, yields, and capability—Continued	
Ruston sandy clay loam:		Capability grouping of soils—Continued	
Severely eroded sloping phase.....	37	Capability unit IVe-1.....	54
Severely eroded moderately steep phase....	38	Capability unit IVe-2.....	54
Severely eroded steep phase.....	38	Capability unit IVe-3.....	55
Sandy alluvial land.....	38	Capability unit IVw-1.....	55
Shannon silt loam, local alluvium phase.....	38	Capability unit VIe-1.....	55
Shubuta-Cuthbert loams:		Capability unit VIe-2.....	55
Moderately steep phases.....	39	Capability unit VIe-3.....	56
Steep phases.....	39	Capability unit VIIe-1.....	56
Shubuta-Cuthbert sandy clays:		Capability unit VIIe-2.....	56
Severely eroded sloping phases.....	39	Forests.....	56
Severely eroded moderately steep phases....	40	Formation and classification of soils.....	57
Shubuta-Cuthbert-Silerton soils:		Factors of soil formation.....	57
Sloping phases.....	41	Parent materials.....	57
Severely eroded sloping phases.....	41	Climate.....	57
Moderately steep phases.....	42	Living matter.....	57
Severely eroded moderately steep phases....	42	Relief.....	58
Shubuta-Ruston-Silerton soils:		Age.....	58
Sloping phases.....	42	Classification of soils by higher categories....	58
Severely eroded strongly sloping phases....	43	Red-Yellow Podzolic soils.....	58
Moderately steep phases.....	43	Dexter series.....	60
Severely eroded moderately steep phases....	44	Lexington series.....	60
Silerton silt loam:		Ruston series.....	60
Eroded gently sloping phase.....	44	Silerton series.....	60
Sloping phase.....	44	Shubuta series.....	60
Eroded sloping phase.....	45	Planosols.....	61
Strongly sloping phase.....	45	Dulac series.....	61
Eroded strongly sloping phase.....	45	Freeland series.....	61
Silerton silty clay loam:		Providence series.....	61
Severely eroded sloping phase.....	46	Tippah series.....	61
Severely eroded strongly sloping phase....	46	Calloway series.....	62
Tippah silt loam:		Hatchie series.....	62
Gently sloping shallow phase.....	46	Almo series.....	62
Severely eroded gently sloping shallow		Low-Humic Gley soils.....	62
phase.....	47	Beechy series.....	62
Sloping shallow phase.....	47	Ina series.....	62
Severely eroded sloping shallow phase....	47	Regosols.....	63
Management, yields, and capability.....	48	Cuthbert series.....	63
General practices of good management.....	48	Alluvial soils.....	63
Estimated yields.....	48	Shannon series.....	63
Capability grouping of soils.....	51	Hymon series.....	63
Capability unit IIe-1.....	52	Engineering applications.....	63
Capability unit IIe-2.....	52	Soil science terminology.....	63
Capability unit IIw-1.....	53	Soil test data and engineering soil classifica-	
Capability unit IIIe-1.....	53	tion.....	66
Capability unit IIIe-2.....	53	Soil test data.....	66
Capability unit IIIe-3.....	53	Engineering classification systems.....	66
Capability unit IIIw-1.....	54	Soil engineering data and recommendations..	67
Capability unit IIIw-2.....	54	Glossary.....	75

# SOIL SURVEY OF HENDERSON COUNTY, TENNESSEE

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE  
TENNESSEE AGRICULTURAL EXPERIMENT STATION AND THE TENNESSEE VALLEY AUTHORITY

## General Nature of the Area

Henderson County is principally agricultural, but many people are employed in industries. Corn and cotton are the principal crops grown in the county. The areas farmed are the wide ridgetops and the bottoms and second bottoms. Most of the steep slopes are under forest or are idle. The wooded areas have never been cultivated or have not been cultivated for at least 50 years. The idle land was once used for crops but has been taken out of cultivation because the soils have become severely eroded. This cooperative survey maps the soils of the county and provides information about them that will aid in determining their best agricultural uses.

## Location and Extent

Henderson County is in the west-central part of Tennessee (fig. 1). Its eastern boundary is about 10 miles

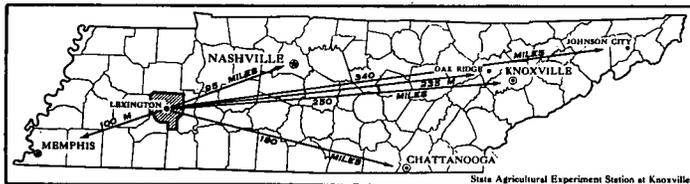


Figure 1.—Location of Henderson County in Tennessee.

west of the Tennessee River and its southern boundary is about 30 miles north of the Mississippi-Tennessee State line. Lexington, the county seat, is approximately midway between Nashville and Memphis. The county has an aggregate area of about 515 square miles, part of which is in the Natchez Trace State Park.

## Physiography, Geology, Relief, and Drainage

Physiographically, Henderson County lies in the extreme eastern part of the plateau slope of western Tennessee.<sup>1</sup> It is part of the East Gulf Coastal Plain.<sup>2</sup> In the eastern part of the county, the Coastal Plain is underlain by the

<sup>1</sup> POND, WALTER F. GEOLOGIC MAP OF TENNESSEE. Tenn. Dept. Ed., Div. Geol. 1933.

<sup>2</sup> WELLS, FRANCIS G. GROUND WATER RESOURCES OF WESTERN TENNESSEE. U. S. Geol. Survey. Water-supply Paper 656. 319 pp., illus. 1933.

Eutaw formation, the Selma formation (Selma chalk), and the Coon Creek tongue of the Ripley formation. These geological formations are of the Upper Cretaceous period. In the western part, the Coastal Plain is underlain by Porters Creek clay and Holly Springs sand of the Tertiary system. The McNairy sand member of the Ripley formation lies in a belt extending roughly north and south through the central part of the county (fig. 2).

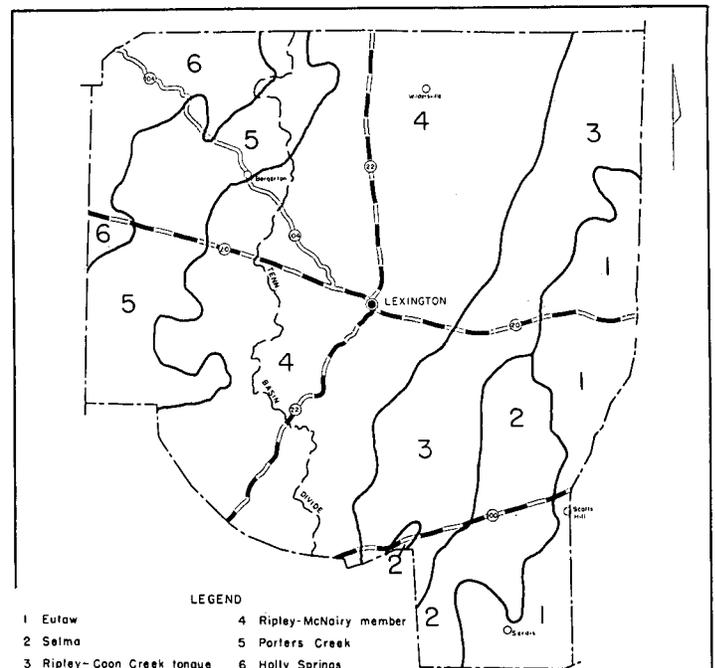


Figure 2.—Generalized map showing geologic formations in Henderson County, Tenn.

During the Pleistocene period, the whole county was covered with a layer of loess. In the western part of the county, this mantle of loess, or silt, is at least 42 inches thick. In the nearly level areas of the eastern part, it is only 24 to 28 inches thick. On the slopes the thickness ranges from 0 to 24 inches, depending upon the gradient of the slope.

This county is on a plain characterized by various degrees of dissection. Most of it is highly dissected and

prevailingly hilly. In most of the county, the elevation is about 500 feet, but the elevation ranges from 379 to 640 feet.

The drainage pattern is well established. The high land in the western part of the county divides the streams flowing eastward to the Tennessee River from the streams flowing westward into the Mississippi. The Beech River, which flows into the Tennessee River, drains the larger part of the county. The headwaters of the Big Sandy River, which flows into the Tennessee River, are north of Lexington. The North and Middle Forks of Forked Deer River rise in Henderson County and help to drain its western part. They are a part of the Mississippi River system.

## Climate

The climate of this county is humid and continental. Winters are mild, with only an occasional cold spell, and summers are hot. July, August, and September are ordinarily the driest months, and the late winter and early spring months are the wettest. Table 1, compiled from the records of the United States Weather Bureau at Wildersville, gives the average monthly and annual precipitation.

TABLE 1.—*Precipitation at Wildersville Station, Henderson County, Tenn.*

[Elevation, 480 feet]

Month	Precipitation <sup>1</sup>			
	Average	Driest year (1941)	Wettest year (1950)	Average snowfall
December	4.76	2.46	3.85	2.1
January	5.72	2.09	17.35	1.6
February	3.70	1.04	6.51	3.8
Winter	14.18	5.59	27.71	7.5
March	5.13	.63	7.06	.9
April	4.69	2.64	3.70	( <sup>2</sup> )
May	4.88	1.59	5.52	0
Spring	14.70	4.86	16.28	.9
June	3.48	1.63	4.31	0
July	3.86	3.93	8.82	0
August	4.60	4.08	5.66	0
Summer	11.94	9.64	18.79	0
September	2.94	.12	5.38	0
October	3.26	4.67	1.50	( <sup>2</sup> )
November	3.72	4.29	5.46	.3
Fall	9.92	9.08	12.34	.3
Year	50.74	29.17	75.12	8.7

<sup>1</sup> Average precipitation based on a 43-year record, through 1955; wettest and driest years based on a 40-year record, in the period 1898-1955; snowfall based on a 17-year record, through 1930.

<sup>2</sup> Trace.

The maximum temperature on record for this county is 110° F.<sup>3</sup> The minimum temperature is -18° F. The average temperature for the month of July is 78.2° F., and for January it is 41.2°. The growing season lasts for about 200 days. The average date of the last frost in spring is April 8, and the average date of the earliest in fall is October 25. Temperatures and precipitation vary little in different parts of the county.

Extreme weather conditions include heavy rainstorms in spring, hailstorms, and tornadoes that occur about once every 10 years. There is often unseasonably warm weather early in spring, followed by a killing frost. At times the fruit buds are heavily damaged by frost.

When heavy rains fall in spring, the bottom lands are generally flooded, and planting is delayed. Also, the pastures on pan soils cannot be grazed because the soil above the pan becomes spongy when wet. Heavy spring rains cause active erosion in many parts of the uplands. In some years, lack of moisture during summer affects crop yields, particularly in the pan soils.

## Water Supply

Creeks, small rivers, wells, springs, cisterns, and farm ponds furnish the water supply for the county. Water for household use is usually taken from cisterns and wells. In most places, wells are about 90 feet deep. The creeks generally provide enough water for livestock, except during the dry summer months, when they are supplemented by small farm ponds, wells, or cisterns. Few springs are large enough to supply water the year around. Livestock raising is limited on some farms by an inadequate supply of water. On nearly all farms, ponds could be built that would make enough water available for the farm needs. Not many farmers irrigate. Probably more of them could irrigate by using water from Beech River and large farm ponds.

Browns Creek Lake and Cub Creek Lake in Natchez Trace State Park provide water for fishing, swimming, and boating. The Beech River and farm ponds also are used for fishing. Kentucky Lake, only 23 miles from Lexington, the county seat, is widely used for recreational purposes.

## Organization and Population

Henderson County was formed in 1821 on land ceded by the Chickasaw Indians. The county was reduced in size in 1845 by the transfer of a strip about 3 miles wide to Decatur County. In 1868 a small area lying west of the North Fork of Forked Deer River was attached to Madison County, and in 1882 a large part of the southwestern corner was attached to Chester County. Henderson County now has an area of about 515 square miles.

A heavy influx of settlers came into the area soon after it was opened in 1821. Most of them came from middle and eastern Tennessee and from North Carolina, South Carolina, Georgia, Virginia, and Kentucky. As a result of this rapid migration, the county developed rapidly. The population has not changed greatly since 1880. In 1950 it was 17,173 as compared with 17,430 in 1880.

<sup>3</sup> UNITED STATES DEPARTMENT OF AGRICULTURE. CLIMATE AND MAN. U. S. Dept. of Agr. Yearbook. 1248 pp., illus. 1941.

**Industries**

Some industries that provide part-time employment are a molding-sand company, two shirt factories, a screw factory, two concrete block plants, a construction company, a dairy, a milk-collecting plant, a soft drink bottling plant, and numerous small sawmills. Many farmers or members of their families have part- or full-time employment at the Wolf Creek Ordnance Plant at Milan, Tenn. This is about 40 miles from Lexington.

**Transportation and Markets**

State Highway 20, from Jackson to Nashville, crosses the center of the county in an east-west direction. It passes through Lexington. State Highway 22, between Huntingdon on the north and Henderson on the southwest, also passes through Lexington. State Highway 104 connects Lexington with Sardis in the southeastern part of the county. Access to Milan from Lexington is through the northwestern part of the county. State Highway 100, from Memphis to Nashville, runs through the southern part of Henderson County. Gravelled rural roads are accessible to almost every farm.

The Nashville, Chattanooga and St. Louis Railway from Memphis to Nashville crosses the county and serves Luray, Huron, Lexington, and Wildersville. Freight and passenger stops are made at Life and Timberlake. Lexington has a small airport, but no passenger service is supplied by large commercial airlines.

The network of roads facilitates marketing of farm products. Some of the markets for agricultural products are a dairy, a milk-collecting plant, a produce house, a livestock auction barn, and numerous cotton gins. A mineral company mines sand on many farms.

**Agriculture**

The agriculture of Henderson County is based largely on the growing of field crops and on the raising of livestock. In the following pages the more outstanding features of this agriculture are pointed out. The statistics used are from reports published by the United States Bureau of the Census.

**Agricultural History**

The earliest agriculture was carried on by the Chickasaw Indians, who were living in this area at the time the white settlers arrived. Apparently, the Indians did most of their camping, hunting, and farming along the bottoms and stream terraces. Apparently, farming small plots of corn was the main extent of their agriculture.

The population of white settlers grew rapidly, and all areas of the county were settled about the same time. The principal crops were corn, hay, small grains, cotton, tobacco, fruits, and vegetables, grown for home consumption. Cultivating was done by hand and with crude animal-drawn implements.

As transportation, marketing facilities, and machinery improved, more cash crops, such as cotton and peanuts, were grown. The first cotton gins appeared around 1840 and, thereafter, cotton production increased greatly.

Cotton is still important as a cash crop. Until recent years, peanuts were an important cash crop. The nature of the soils, the intensive row cropping practiced in the early years on land not suited to it, and the lack of proper conservation measures largely account for the extensive gullied areas.

**Land Use and Size of Farms**

In 1954, 253,942 acres, or 77 percent of the land area in the county, was in farms. Of this, 121,103 acres was used for crops. Approximately 70,523 acres was pastured, and 90,833 acres was woodland. Approximately 24,185 acres of the land that was pastured was woodland. There were 2,423 farms in the county. The average size of the farms was 104.8 acres.

**Types of Farms**

Field crops have always been important in Henderson County. On some farms livestock provides the main source of income. In 1954, approximately 26.6 percent of the farms in the county were miscellaneous and unclassified. The rest were listed by type as follows:

	<i>Number</i>
Field crop other than fruit or nut.....	1, 456
Cotton farms.....	1, 440
Cash grain farms.....	16
General farms.....	85
Primarily crop farms.....	40
Crop and livestock farms.....	45
Dairy farms.....	20
Poultry farms.....	10
Livestock farms other than dairy and poultry.....	185

**Crops**

Based on acreage, the most important crops grown in Henderson County are corn and cotton, but lespedeza is grown extensively for hay. Minor crops are soybeans, cowpeas, sorghum, and small grains (oats, wheat, barley, and rye). The acreage of the principal crops and the number of bearing fruit trees are shown in table 2.

TABLE 2.—*Acreage of principal crops and number of bearing fruit trees*

Crop	1929	1939	1949	1954
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Corn (harvested for grain).....	34, 964	31, 936	24, 440	31, 888
Cotton.....	35, 412	20, 297	31, 089	19, 727
Hay crops (mostly lespedeza cut for hay).....	10, 404	15, 405	11, 076	7, 361
Soybeans grown alone.....	452	1, 780	410	910
Cowpeas grown alone.....	441	89	186	586
Sorghum (for all purposes except sirup).....	57	65	44	390
Small grains (for all purposes).....	203	13	42	125
	<i>Number</i> <sup>1</sup>	<i>Number</i> <sup>1</sup>	<i>Number</i> <sup>1</sup>	<i>Number</i>
Apple trees.....	12, 135	13, 031	10, 197	3, 834
Peach trees.....	19, 447	23, 136	10, 000	3, 246

<sup>1</sup> Figures given are for 1 year later than year at head of column.

*Cotton.*—Cotton has always been an important crop, but in 1954 it was second to corn in total acreage. Up to 1949 the acreage had not changed appreciably since the cotton gin was invented. During the past few years, however, the acreage has decreased as a result of acreage allotments. The total yield has not been affected materially, because farmers have a greater proportion of their acreage on better soils and are practicing better management.

Practically all of the soils of the county have been used for cotton, but the best yields are obtained from the better drained soils. Commercial fertilizers are commonly used under cotton. The most common application on all of the soils is 200 to 400 pounds of 6-12-12.

*Corn.*—Corn is grown on practically every farm in the county. It is used mainly as grain for livestock feed or as a cash crop. Generally, part of the crop is gathered, and then hogs are turned in on the rest. Corn is grown on both the uplands and bottoms, but yields are generally greater on the bottoms. In dry years corn yields may decrease in the uplands but may increase on the poorly drained bottom lands. Use of commercial fertilizer is fairly common. On most soils 200 pounds of 4-8-8, or a similar mixture, and a side dressing of 50 pounds of ammonium nitrate are average applications.

*Hay.*—Lespedeza is the principal hay crop. Some soybeans, alfalfa, and oats are grown for hay, and pasture clippings of fescue, orchardgrass, and whiteclover are used to a lesser extent. Lespedeza is grown on practically all of the soils of the county, and most of the soils are well suited to it. Fertilizers are not commonly applied for hay crops, but most areas have been limed at one time or another. On the few areas where cover crops are grown, they are commonly followed by lespedeza or soybeans. Most of the hay is used on the farm. Little is sold or shipped out of the county.

*Small grains and other minor crops.*—Small grains, as oats, wheat, barley, and rye, have been grown on a limited acreage since the days of the early settlers. Recently the acreage has increased, as management has improved. Small grains are commonly grown in combination with vetch. Ordinarily they follow the cotton crop. As most of the bottom lands flood late in winter and early in spring, most of the small grains are grown on the uplands and second bottoms.

In recent years sorghum, grown alone or with corn, has been used to some extent for silage. The sorghum is the kind usually used for making sirup, but here little is used for that purpose. Most of the sorghum is grown on wet bottom lands, areas of local alluvium, or on second bottoms.

## Rotations and Amendments

Crops are rotated systematically on only a small part of the total cropland in the county. For the most part, the kind of crop and the frequency of planting are determined by the needs of the operator. On the bottoms, where flooding is frequent late in winter and early in spring, summer annuals are grown intensively and no cover crops are used. On local alluvial lands that do not flood, and on gently sloping uplands and second bottoms, row crops are grown intensively. About one-fourth of the farmers grow cover crops, such as small grains and vetch.

Generally if rotations are used, they are too short to be fully effective. One of the commoner rotations used on practically all of the soils is cotton or corn followed by a small grain overseeded with lespedeza. The lespedeza is generally followed by vetch, vetch and small grain, crimson clover, or other winter cover crop, which is turned under. The soil is then replanted to a row crop. If adequate lime and fertilizer are added, this rotation results in good yields on most of the mild slopes. Such a rotation, however, is too short to prevent erosion on many of the soils on which it is used.

For many years most of the farmers in the county have used lime and fertilizer under the cotton crop. The use of soil amendments is now becoming widespread for other crops. Most farmers who now use fertilizer on crops other than cotton have had the soils tested by a member of the Tennessee Crop Improvement Association. Other assistance in testing the soils can be obtained by contacting the county agricultural agent or the local representative of the Soil Conservation Service.

## Livestock

Most of the farmers in the county have only one cow and a few hogs, but some depend on livestock as their main source of income. In 1954, there were 17,631 hogs and pigs in the county and 12,058 cattle and calves. Most of the beef cattle are grade Herefords or Angus, and most of the dairy cattle are grade Jerseys. There are a few herds of purebred Jerseys and Holsteins in the county. Most of the livestock products are sold locally.

## Pasture

Most of the pastures in the county are wild or consist mainly of lespedeza. In recent years, however, more farmers are improving pastures by seeding to fescue, orchardgrass, Ladino clover, or white clover. Some bermudagrass is grown for pasture, and a few areas are in alfalfa, kudzu, or sericea lespedeza. Generally, where plants other than lespedeza are used for pasture, lime and fertilizer are added. On these pastures management is fairly good, except that most of them are overgrazed during the dry summer months.

## Farm Tenure

In 1954, there were 2,423 farms in the county, of which 1,231 were operated by owners, 439 by part-owners, and 753 by tenants. Of the tenants, 31 were cash tenants, 3 were share-cash tenants, 389 were share tenants, and 265 were croppers. The rest were unspecified.

Under the most common arrangement between the tenant and landlord, the landlord supplies the land and equipment and the tenant furnishes the labor and fertilizer. The crop is shared. The usual arrangement is for two-thirds of it to go to the tenant and one-third to the owner. On many farms part of the farm is rented and the rest is worked by the tenant. On these farms the operator of the rented part usually hires the tenant during off seasons.

Normally, contracts between owners and tenants are verbal and made for one year only. The year begins before planting time and is terminated when the harvest season is ended.

## Farm Power and Mechanical Equipment

Electricity from TVA powerlines is available to practically all of the residents of the county. A pipeline for natural gas and one for crude oil cross the county. Natural gas is available to Lexington and Scotts Hill.

In 1954, there were 1,151 tractors reported on 1,091 farms in the county; 775 motortrucks on 755 farms; 35 grain combines on 35 farms; and 20 field forage harvesters on 20 farms. There were also 10 cornpickers on 10 farms, and 35 pickup hay balers on 35 farms.

## How a Soil Survey Is Made

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

**FIELD STUDY.**—The soil surveyor bores or digs many holes to see what the soils are like. The holes are spaced irregularly according to the lay of the land. Usually they are not more than a quarter of a mile apart, and sometimes they are much closer. In most soils there are several distinct layers, called horizons, which collectively are known as the soil profile. The profile is studied to see how the horizons differ from one another and to learn the things about the soil that influence its capacity to support plants.

**Color** is usually related to the amount of organic matter. The darker the surface soil, as a rule, the more organic matter it contains. Streaks and spots of gray, yellow, and brown in the lower layers generally indicate poor drainage and poor aeration.

**Texture**, or the content of sand, silt, and clay, is determined by the way the soil feels when rubbed between the fingers, and is later checked by laboratory analysis. Texture determines how well the soil retains moisture, plant nutrients, and fertilizer and whether it is easy or difficult to cultivate.

**Structure**, which is the way the individual soil particles are arranged in aggregates, and the amount of pore space between aggregates, gives us clues to the ease or difficulty with which the soil is penetrated by plant roots and by moisture. The aggregates may have prismatic, columnar, blocky, platy, or granular structure.

**Consistence**, or the tendency of the soil to crumble or to stick together, indicates whether it is easy or difficult to keep the soil open and porous under cultivation.

**Other characteristics** observed in the course of the field study and considered in classifying the soil include the following: The depth of the soil over bedrock or compact layers; the presence of gravel or stones in amounts that will interfere with cultivation; the steepness and pattern of slopes; the degree of erosion; the nature of the underlying material; and the acidity or alkalinity of the soil as measured by chemical tests.

**CLASSIFICATION.**—On the basis of the characteristics observed by the survey team or determined by laboratory tests, soils are classified by series, types, and phases.

As an example of classification, consider how the Dexter series of Henderson County is separated into types and phases:

Series	Types	Phases	
Dexter-----	Fine sandy loam-----	Eroded sloping phase.	gently sloping
	Fine sandy clay loam-----	Severely eroded sloping phase.	gently sloping
		Severely eroded phase.	sloping
	Silt loam-----	Eroded sloping phase.	gently sloping
Silty clay loam-----	Sloping phase.		
	Severely eroded phase.	sloping	

**Soil series.**—Soils similar in kind, thickness, and arrangement of layers are normally designated as a soil series. In a given area, however, a soil series may be represented by only one soil.

**Soil type.**—Within a soil series, there may be one or more soil types. The soil types are determined by the texture of the surface layer.

**Soil phase.**—Soil types are divided into soil phases because of differences other than those of kind, thickness, and arrangement of layers. Slope variations, frequency of rock outcrops, degree of erosion, depth of soil over the substratum, and natural drainage, are examples of characteristics that suggest dividing a soil type into phases.

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

**Miscellaneous land types.**—Fresh stream deposits and rough, stony, or severely gullied land are not classified by types and series but are identified by a descriptive name. Moderately gullied land, Cuthbert-Silerton materials, is an example of a miscellaneous land type in this county. There are four other such miscellaneous land types in the county. All are the result of severe erosion.

**Soil complex.**—When two or more soils occur in such an intricate pattern that it is not feasible to show them separately on the soil map, they are mapped together and called a soil complex. An example of a soil complex is Cuthbert-Silerton soils, sloping phases.

## Soil Associations

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

Each association contains several different soils arranged in a characteristic pattern. As a rule the pattern is related to the nature of the soil materials and to the shape of the land surface. For example, in most places the Lexington soils occur on ridgetops and the Ruston soils are on the adjacent slopes. Likewise, the Ina soils, which occur only on bottom lands and in positions nor-

mally occupied by local alluvial soils, lie next to Hymon and Beechy soils, also of the bottom lands. Such geographically associated groups of soils can be shown on a generalized map.

Soil associations are useful in land-use planning because it is important to know how the soils are distributed. For example, a soil suited to intensive cropping may or may not be used for that purpose, depending on whether it occurs with soils suited to intensive cropping. By studying the geographic pattern of soils along with the characteristics of the soils, suitable agricultural uses can be planned for large areas.

The six soil associations recognized in Henderson County and shown on the colored map at the back of this report are discussed in the following pages. More detailed knowledge of the soils in these associations can be obtained by studying the detailed soil map and by reading the section on soil descriptions.

### 1. Ina-Beechy-Hymon Association

This association consists mainly of soils of the first bottoms, but some adjacent areas of Dexter, Freeland, Hatchie, and Almo soils are included. The Ina soils predominate. The association areas lie along the Beech and Forked Deer Rivers and their tributaries.

All but the second bottoms are frequently flooded in winter and early in spring. Therefore, the soils are used mainly for summer crops, hay, and pasture. Cotton is the main crop in this area, but there are a few corn and hog farms, a few livestock farms, and a few general farms.

### 2. Ruston-Lexington Association

This association covers about half of the county. The soils are similar to those in the Lexington-Ruston association, but here the Ruston soils are more extensive. As a group the soils are less important to the agriculture of the county than the soils of the Lexington-Ruston association, even though they are much greater in extent. This association is in the extreme western part of the county and in a belt through the central part of the county. In addition to the Ruston and Lexington soils, it consists partly of Hymon, Ina, Beechy, Dexter, and Freeland soils.

The soil pattern is such that the Lexington soils occupy narrow ridgetops, and the Ruston soils, moderately steep to steep ridge slopes. Although the Lexington soils are productive, in many places small areas are isolated by Ruston soils that are unsuited to crops. Consequently, many areas of Lexington soils remain in forest. The acreage of cropland on the individual farms is small. The size of the average farm is about 50 acres.

Cotton is grown on the narrow Lexington ridgetops. Corn, cotton, and hay are grown on the adjacent terrace, bottom, and local alluvial soils. Most of the farm products are grown for home use. In some places the Ruston soils are used for pasture, but for the most part they are in forests of cutover hardwoods.

### 3. Lexington-Ruston Association

In this association the Lexington soils are the most extensive and the most important to the agriculture of the county (fig. 3). The soils are on gently sloping to



Figure 3.—Active gullies in the Lexington-Ruston soil association.

moderately steep uplands. The Lexington soils are on the broad ridgetops, and the Ruston soils generally are on short, moderately steep adjacent slopes. Other less extensive soils in this area are the Providence, Shannon, Hymon, Ina, Beechy, Dexter, and Freeland soils. The Shannon, Hymon, Ina, and Beechy soils are on bottom lands and in local alluvial positions; the Providence is on broad ridgetops; and the Dexter and Freeland are on the foot slopes.

This association includes the town of Lexington. It extends directly north of the town for a distance of about 5 miles.

As a group the soils of this association are well suited to agriculture. The Lexington, Providence, Shannon, Hymon, and Ina soils are well suited to row crops, such as cotton and corn. The Ruston soils are droughty, generally moderately steep, and low in fertility. They are used mainly for pasture and forest. The Beechy soils are wet and are best suited to pasture or forest.

The farms on this association average about 100 acres in size and are used primarily for growing cotton. A few head of livestock, including dairy cattle and sheep, are raised, mainly for home use. Most of the corn, hay, small grains, and pasture plants are fed to these animals.

### 4. Shubuta-Cuthbert Association

This association is in the eastern part of the county. The Shubuta and Cuthbert soils occupy slopes next to the Dulac and Silerton soils, which are on fairly narrow ridgetops. Small areas of Tippah soils are also on the ridgetops. Areas of Dexter, Freeland, Hatchie, and Almo soils are on the foot slopes and second bottoms next to the ridge slopes. Hymon, Ina, and Beechy soils occupy the small draws.

Most of the soils on ridgetops, second bottoms, foot slopes, and first bottoms are used for row crops. The moderately steep and steep ridge slopes are in forest or pasture (fig. 4). Small general farms and farms that specialize in corn or hogs are common in this area. There are a few other livestock farms in addition to the hog farms. A few cotton farms are on the bottom lands and terraces, where the acreage of suitable soils is large enough



Figure 4.—Dairy herd grazing on fescue and Ladino clover in Shubuta-Cuthbert soil association.

to support them. The farms are generally small, and the products are mainly for home use.

### 5. Dulac-Tippah-Cuthbert Association

This association is in the western part of the county. It is characterized by a soil pattern in which Dulac, Tippah, and, to a lesser extent, Calloway soils occupy broad gently sloping to sloping ridgetops and in which Cuthbert and Dulac soils occupy the sloping and strongly sloping ridge sides.

The soils on ridgetops are fairly productive. In this association the Freeland, Hatchie, and Almo soils of the foot slopes and the Hymon, Ina, and Beechy local alluvial and bottom soils are also fairly productive. Because of their droughtiness, low fertility, and susceptibility to erosion, the soils on the ridge slopes are best suited to pasture and forest.

Cotton farms are the most common type in this area. A few animals are raised for home use and for sale locally. The proportion of tenant farms is high compared to that of other areas in the county.

### 6. Ruston-Shubuta-Silerton Association

This association is in the extreme eastern part of the county. The landscape is similar to that of the Shubuta-Cuthbert association. The soil pattern and many of the soils, as well as the agriculture, are similar. In this association the Ruston soils are on moderately steep and steep ridge slopes next to Shubuta and Cuthbert soils. Included areas of the Dulac and Tippah soils are generally smaller and more widely scattered than in the Shubuta-Cuthbert association.

## Soil Series and Their Relations

The soils of Henderson County differ in many characteristics, including color, texture, consistence, reaction, relief, stoniness, depth to underlying material, permeability, and drainage. These differences affect their suitability for agriculture.

The relationship among the soils is more easily understood if they are grouped according to their position on the landscape. Accordingly, the main soil series are discussed by physiographic groups as follows: (1) Soils of the uplands; (2) soils of the terraces; and (3) soils of the bottom lands and local alluvial lands. Some of the groups are further divided to show the different kinds of parent materials from which the soils in one physiographic position were formed.

### Soils of the Uplands

The soils of the uplands have been placed in two groups: Soils developed in wind-laid silty materials (loess), and soils developed in Coastal Plain sands and clays (marine deposits).

#### Soils developed in loess

In this group are the Lexington, Providence, Silerton, Dulac, Tippah, and Calloway soils. These soils are well drained to somewhat poorly drained. The silt mantle in which they have developed is generally less than 3½ feet thick, but that in which the Calloway soils have developed is 4 to 5 feet thick.

The Lexington and Silerton soils are brown, well-drained soils that differ mainly in the texture of their lower layers. The Lexington soils have developed in loess that overlies permeable sand. The Silerton soils have developed in loess that overlies sandy clay.

The Dulac, Providence, and Tippah soils are moderately well drained, and the Calloway soils are somewhat poorly drained. In all of these soils a siltpan of variable thickness and compaction occurs at a depth of about 2 feet. Differences among these soils are related mainly to differences in the material that underlies the loess. The material underlying the silt layer of the Providence soils consists of permeable sand or light sandy clay; that underlying the Dulac is slowly permeable sandy clay; and that underlying the Tippah and Calloway is very slowly permeable clay.

#### Soils developed chiefly in Coastal Plain sands and clays

This group consists of the Ruston, Cuthbert, and Shubuta soils. These soils have developed in Coastal Plain materials that range from loose, noncoherent sands to heavy plastic sandy clays.

Differences among the soils of this group are related to differences among the materials from which the soils have developed. The Ruston soils have developed in loose sands. They have a surface soil of fine sandy loam and a very friable reddish-brown to yellowish-red subsoil and substratum. The Cuthbert soils have developed in brittle acid sandy clay, in many places interbedded with thin layers of gray clay. The Shubuta soils, which are redder than the Cuthbert soils, have developed in heavy sandy clay.

### Soils of the Terraces

The soils of the stream terraces have developed in old mixed alluvium washed from loess and from Coastal Plain sands and clays. They generally lie above the overflow stages of the present streams.

The differences among these soils were caused mainly by differences in drainage. The Dexter, Freeland, Hatchie, and Almo soils of this group comprise a catena of soils. In this catena the Dexter soils are well drained, the Freeland soils are moderately well drained, the Hatchie soil is somewhat poorly drained, and the Almo soil is poorly drained.

The differences in the drainage of these soils are chiefly related to differences in relief. The Dexter soils generally are on dominantly gentle to strong slopes; the Freeland soils are on gentle slopes; the Hatchie is in nearly level areas; and the Almo is in level areas or in depressions. Differences in drainage among these soils are also caused by differences in the permeability of the substrata and in the number of outlets for underground flow of water.

### Soils of the Bottom Lands and Local Alluvial Lands

The soils of the bottom lands are the Shannon, Hymon, Ina, and Beechy. The soils of the local alluvial lands are phases of the Shannon, Hymon, and Ina soils. The soils make up a catena that consists of the well-drained Shannon soil, the moderately well drained Hymon soils, the somewhat poorly drained Ina soils, and the poorly drained Beechy soils. The soils of the bottom lands are nearly level and are subject to overflow. Those of the local alluvial lands are generally on gentle slopes and are less subject to overflow than the soils of the bottom lands. The texture of the surface soils is silt loam, fine sandy loam, or loamy fine sand.

### Soil Descriptions

In the following pages the soil types and phases of Henderson County are described in detail and their use for agriculture is discussed. After the name of each soil a symbol is given, which is the same as that shown on the soil map that accompanies this report. The soil map shows the location and distribution of all the soils. The approximate acreage and proportionate extent of the soils mapped are given in table 3. For definitions of special terms used in the soil descriptions, see the glossary on p. 75.

**Almo silt loam (Aa).**—This gray, poorly drained soil is scattered throughout the county on nearly level terraces or second bottoms. It has developed in shallow loess over old alluvium that washed from loess and sandy Coastal Plain materials. It is associated with Dexter, Freeland, and Hatchie soils of the terraces and with Hymon, Ina, and Beechy soils of the bottom lands.

Profile description:

- 0 to 6 inches, light-gray very friable silt loam; weak fine crumb structure.
- 6 to 18 inches, brownish-yellow friable silt loam, mottled with light gray; weak medium subangular blocky structure.
- 18 to 28 inches, (pan) mottled gray, dark-brown, and yellowish-brown firm silty clay loam; moderate coarse angular blocky structure.
- 28 inches+, mottled (gray, brown, and yellow) very fine sandy clay loam; content of sand increases with depth.

The texture in the layer beneath the pan ranges from silt loam to sandy loam but generally becomes coarser with increasing depth. The texture of the pan layer ranges from silty clay loam to silty clay.

This soil is acid. It is low in organic matter and plant nutrients, especially potassium, and in water-supplying capacity. In winter the soil is wet, and in summer it is droughty. Runoff is slow, and internal drainage is very slow.

In the northwestern part of the county, a few areas of poorly drained upland soil have been included in this mapping unit.

*Present use and management.*—About three-fourths of this soil is in crops or pasture, and the rest is in forests of cutover hardwoods. Sorghum, soybeans, and lespedeza are the principal crops, but some cotton and corn are grown. Unless the soil is adequately drained and fertilized, yields of cotton and corn are low. A few areas have been drained by tile or ditches and planted to corn and cotton, but only moderate yields were obtained.

*Management requirements.*—If the soil is adequately drained, sorghum, soybeans, and similar crops can be grown with fair success. Satisfactory drainage may be difficult, especially in depressions, because outlets are not always available. For this reason, the soil is best suited to pasture and hay. Pasture management should include regulated grazing, weed clipping, selecting suitable crops, and fertilizing as indicated by soil tests. Areas in trees should not be cleared unless needed for pasture.

Hay and pasture crops to which the soil is suited are fescue, white clover, alsike clover, bermudagrass, and lespedeza. This soil is in capability unit IVw-1.

**Beechy silt loam (Bb).**—This poorly drained soil occurs throughout the county on stream bottoms, in draws, and on foot slopes. It consists of young mixed alluvium washed from soils that have formed in loess and in sandy Coastal Plain material. It is associated with other bottom-land and local alluvial soils of the Hymon, Ina, and Beechy series.

Profile description:

- 0 to 4 inches, dark grayish-brown very friable silt loam.
- 4 inches+, mottled light-gray, olive-brown, and yellowish-brown friable silt loam; thin layers of sand are common.

The large areas along stream bottoms are frequently flooded, and a few areas are permanently swampy. Some smaller areas of poorly drained soils in small draws and on foot slopes and high bottoms are not flooded so frequently. All of the areas have a high water table, and the soil is usually saturated during winter and in spring. This soil is acid and moderately high in organic matter and plant nutrients. Surface runoff and internal drainage are very slow.

*Present use and management.*—About 40 percent of this soil is cleared. The rest is in hardwood forest consisting of ash, willow, beech, and water-tolerant oaks. About one-half the cleared part is idle and is covered with hoary alder and swampgrass. Corn, lespedeza, soybeans, and sorghum are the principal crops grown on the other half. Crops are not commonly fertilized or rotated, and the soils normally are not artificially drained. Moderate yields of hay are usual, but yields of corn are highly variable. In dry seasons corn yields are generally comparable to those on the better drained soils on the bottom lands. In wet years the entire crop generally drowns out. Pastures are normally fair to good.

*Management requirements.*—Without proper artificial drainage, this soil is poorly suited to row crops. It is best suited to hay and pasture, which produce higher yields if open ditches, bedding, or tile drainage is used.

TABLE 3.—Approximate acreage and proportionate extent of soils

Soil	Area	Extent	Soil	Area	Extent
	<i>Acres</i>	<i>Percent</i>		<i>Acres</i>	<i>Percent</i>
Almo silt loam.....	2, 074	0. 6	Ina loamy fine sand, local alluvium phase...	782	0. 2
Beechy silt loam.....	27, 711	8. 4	Ina silt loam.....	15, 891	4. 8
Beechy fine sandy loam.....	4, 704	1. 4	Ina silt loam, local alluvium phase.....	21, 344	6. 5
Calloway silt loam:			Lexington silt loam:		
Gently sloping phase.....	268	. 1	Eroded gently sloping phase.....	6, 303	1. 9
Eroded gently sloping phase.....	665	. 2	Sloping phase.....	2, 564	. 8
Cuthbert-Silerton soils:			Eroded sloping phase.....	2, 815	. 9
Sloping phases.....	562	. 2	Lexington silty clay loam:		
Severely eroded sloping phases.....	662	. 2	Severely eroded gently sloping phase.....	1, 132	. 3
Strongly sloping phases.....	231	. 1	Severely eroded sloping phase.....	10, 470	3. 2
Severely eroded strongly sloping phases.....	719	. 2	Severely eroded strongly sloping phase.....	1, 270	. 4
Moderately steep phases.....	10, 608	3. 2	Lexington-Ruston soils:		
Severely eroded moderately steep phases.....	4, 092	1. 2	Sloping phases.....	3, 230	1. 0
Dexter fine sandy loam:			Eroded sloping phases.....	744	. 2
Eroded gently sloping phase.....	704	. 2	Severely eroded sloping phases.....	4, 576	1. 4
Eroded sloping phase.....	128	( <sup>1</sup> )	Strongly sloping phases.....	874	. 3
Dexter fine sandy clay loam:			Severely eroded strongly sloping phases.....	2, 619	. 8
Severely eroded gently sloping phase.....	142	( <sup>1</sup> )	Moderately steep phases.....	27, 222	8. 2
Severely eroded sloping phase.....	744	. 2	Severely eroded moderately steep phases.....	15, 094	4. 6
Dexter silt loam:			Providence silt loam:		
Eroded gently sloping phase.....	810	. 2	Eroded gently sloping phase.....	1, 038	. 3
Sloping phase.....	180	( <sup>1</sup> )	Severely eroded gently sloping phase.....	560	. 2
Dexter silty clay loam, severely eroded sloping phase.....	518	. 1	Sloping phase.....	618	. 2
Dulac silt loam:			Eroded sloping phase.....	527	. 1
Eroded gently sloping deep phase.....	3, 777	1. 1	Severely eroded sloping phase.....	2, 610	. 8
Sloping deep phase.....	699	. 2	Severely eroded strongly sloping phase.....	517	1. 5
Eroded sloping deep phase.....	739	. 2	Ruston fine sandy loam:		
Strongly sloping deep phase.....	421	. 1	Sloping phase.....	246	. 1
Dulac silty clay loam:			Moderately steep phase.....	3, 569	1. 1
Severely eroded gently sloping deep phase.....	587	. 2	Steep phase.....	2, 094	. 6
Severely eroded sloping deep phase.....	3, 663	1. 1	Ruston sandy clay loam:		
Severely eroded strongly sloping deep phase.....	784	. 2	Severely eroded sloping phase.....	167	( <sup>1</sup> )
Dulac-Cuthbert soils:			Severely eroded moderately steep phase.....	2, 274	. 7
Severely eroded strongly sloping phases.....	839	. 2	Severely eroded steep phase.....	223	. 1
Moderately steep phases.....	1, 376	. 4	Sandy alluvial land.....	521	. 1
Dulac and Tippah silt loams:			Shannon silt loam, local alluvium phase.....	534	. 2
Gently sloping phases.....	137	( <sup>1</sup> )	Shubuta-Cuthbert loams:		
Eroded gently sloping phases.....	358	. 1	Moderately steep phases.....	5, 242	1. 6
Sloping phases.....	358	. 1	Steep phases.....	421	. 1
Eroded sloping phases.....	556	. 2	Shubuta-Cuthbert sandy clays:		
Dulac and Tippah silty clay loams:			Severely eroded sloping phases.....	418	. 1
Severely eroded gently sloping phases.....	440	. 1	Severely eroded moderately steep phases.....	2, 349	. 7
Severely eroded sloping phases.....	2, 556	. 8	Shubuta-Cuthbert-Silerton soils:		
Severely eroded strongly sloping phases.....	703	. 2	Sloping phases.....	1, 373	. 4
Freeland fine sandy loam, eroded gently sloping phase.....	218	( <sup>1</sup> )	Severely eroded sloping phases.....	3, 083	1. 0
Freeland fine sandy clay loam, severely eroded sloping phase.....	281	. 1	Moderately steep phases.....	4, 346	1. 3
Freeland silt loam:			Severely eroded moderately steep phases.....	2, 950	. 9
Eroded gently sloping phase.....	5, 057	1. 5	Shubuta-Ruston-Silerton soils:		
Severely eroded gently sloping phase.....	489	. 1	Sloping phases.....	719	. 2
Eroded sloping phase.....	1, 928	. 6	Severely eroded strongly sloping phases.....	1, 708	. 5
Severely eroded sloping phase.....	3, 635	1. 1	Moderately steep phases.....	3, 356	1. 0
Severely eroded strongly sloping phase.....	535	. 2	Severely eroded moderately steep phases.....	3, 404	1. 0
Gullied land:			Silerton silt loam:		
Moderately gullied land:			Eroded gently sloping phase.....	424	. 1
Cuthbert-Silerton materials.....	9, 917	3. 0	Sloping phase.....	2, 709	. 8
Lexington-Ruston materials.....	28, 730	8. 7	Eroded sloping phase.....	1, 894	. 6
Severely gullied land:			Strongly sloping phase.....	187	( <sup>1</sup> )
Cuthbert-Silerton materials.....	1, 050	. 3	Eroded strongly sloping phase.....	52	( <sup>1</sup> )
Lexington-Ruston materials.....	6, 738	2. 0	Silerton silty clay loam:		
Hatchie silt loam, gently sloping phase.....	4, 314	1. 3	Severely eroded sloping phase.....	4, 749	1. 4
Hymon fine sandy loam.....	563	. 2	Severely eroded strongly sloping phase.....	626	. 2
Hymon fine sandy loam, local alluvium phase.....	4, 955	1. 5	Tippah silt loam:		
Hymon silt loam.....	562	. 2	Gently sloping shallow phase.....	197	( <sup>1</sup> )
Hymon silt loam, local alluvium phase.....	6, 126	1. 8	Severely eroded gently sloping shallow phase.....	185	( <sup>1</sup> )
Ina fine sandy loam.....	1, 422	. 4	Sloping shallow phase.....	207	( <sup>1</sup> )
Ina fine sandy loam, local alluvium phase.....	5, 971	1. 8	Severely eroded sloping shallow phase.....	479	. 1
			Mines and pits.....	88	( <sup>1</sup> )
			Total.....	329, 600	100. 0

<sup>1</sup> Less than 0.1 percent.

Diversion ditches may be used to intercept runoff from nearby slopes. If satisfactory drainage can be established and maintained, sorghum, soybeans, corn, and cotton can be grown.

This soil is suited to pasture and hay plants, such as fescue, bermudagrass, white clover, alsike clover, and lespedeza. Good management of pasture and hay crops includes regulating grazing and applying lime and fertilizer frequently in amounts determined necessary by soil tests. The soil is in capability unit IVw-1.

**Beechy fine sandy loam (Ba).**—This poorly drained soil consists of young mixed alluvium washed from soils that have formed in loess and sandy Coastal Plain material. It differs from Beechy silt loam in having a sandier surface texture and in being generally sandier throughout. It is widely scattered throughout the county and is associated with Beechy silt loam and with soils of the Hyman and Ina series.

*Profile description:*

- 0 to 5 inches, grayish-brown loose fine sandy loam.
- 5 inches+, mottled light-gray, olive-brown, and yellowish-brown very friable loam.

Stratification of sand and silt is common throughout the profile. On some areas included in this mapping unit, up to 12 inches of fresh sand has been deposited. Other areas of poorly drained soils of the local alluvial lands have a fine sandy loam texture.

This soil is acid. It is low to moderate in organic matter and plant nutrients. The areas on the bottoms are frequently flooded, and some areas are permanently swampy. The water table is high in all areas, and in winter and spring the soil ordinarily is saturated. Runoff and internal drainage are very slow.

*Present use and management.*—About 50 percent of this soil has been cleared, and the rest is in forest. Of the cleared land, about 60 percent is in crops or pasture, and the rest is idle. Hoary alder and swampgrass are the dominant plants on idle areas. Corn, cotton, lespedeza, soybeans, and sorghum are the principal crops. As a rule, the soil dries sooner than Beechy silt loam, and yields are less variable. Yields in dry seasons, however, are usually lower on this soil. Fertilizers, crop rotations, and artificial drainage are not commonly used, particularly in the larger stream bottoms.

*Management requirements.*—Areas that have not been cleared are better left in trees. Where adequate drainage is established and runoff water from other areas is controlled, row crops can be grown intensively. Suitable crops for drained areas are cotton, corn, soybeans, and sorghum. If outlets are available, drainage can be improved by open ditches or bedding. Diversion ditches will intercept runoff and reduce the amount of sand deposited.

Green-manure crops should be grown on areas not subject to damage from overflow. The soil is suited to fescue, bermudagrass, white clover, alsike clover, lespedeza, and other pasture plants. Grazing should be regulated, and the need for fertilizer determined by soil tests. The soil is in capability unit IVw-1.

**Calloway silt loam, gently sloping phase (Ca).**—This yellow, somewhat poorly drained upland soil occurs on broad, gently sloping ridgetops. Some areas are nearly level. This soil has developed in a moderately deep layer (48 to 64 inches) of loess that overlies sandy clay and

clay Coastal Plain materials. It is associated with Dulac, Tippah, and Cuthbert soils.

*Profile description:*

- 0 to 6 inches, dark grayish-brown very friable silt loam; weak fine crumb structure.
- 6 to 15 inches, light yellowish-brown friable silt loam with light olive-brown mottles; weak medium blocky structure.
- 15 to 36 inches, (pan) mottled brown, yellow, and light olive-gray silty clay loam; moderate coarse subangular blocky structure.
- 36 inches+, mottled yellowish-brown and light-gray friable silt loam.

The texture of the pan layer ranges from silty clay loam to silty clay. Cracks and seams filled with clay and silt are in the pan layer and in the layer below. The pan is generally thicker and nearer the surface than the pan in the Dulac soils; consequently, this soil is more droughty than the Dulac soils.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-supplying capacity. Roots, air, and water penetrate the surface soil and subsoil readily, but the pan layer is slowly permeable. Runoff is medium to slow, and internal drainage is slow.

*Present use and management.*—About one-half of this soil is in cutover hardwood forest. The rest is cleared and in crops and pasture. Lespedeza, soybeans, sorghum, cotton, and corn are the principal crops. Crops are not fertilized adequately. Yields of most crops, particularly corn, are low, but lespedeza gives good yields of hay and pasture.

*Management requirements.*—With proper surface drainage, this soil is suitable for row crops if they are rotated with grasses and legumes and are not on the soil more than one-fourth to one-half of the time. Open ditches, bedding, row arrangement, and diversion ditches will normally drain off excess water. The soil is suited to small grains and soybeans and, to a lesser extent, to sorghum, cotton, and corn. It is suited to such pasture and hay plants as fescue, whiteclover, lespedeza, and bermudagrass. It is in capability unit IIIw-1.

**Calloway silt loam, eroded gently sloping phase (Cb).**—This somewhat poorly drained upland soil occurs on broad ridgetops on slopes of 2 to 5 percent. It has developed in a moderately deep layer (48 to 64 inches) of loess that overlies sandy clay or clay Coastal Plain materials. It occurs in the same general area as Calloway silt loam, gently sloping phase. Some areas are severely eroded.

*Profile description:*

- 0 to 6 inches, dark grayish-brown very friable silt loam; weak fine crumb structure.
- 6 to 14 inches, light yellowish-brown friable silt loam with light olive-brown mottles; weak medium blocky structure.
- 14 to 35 inches, (pan) mottled brown, yellow, and light olive-gray silty clay loam; moderate coarse angular blocky structure.
- 35 to 60 inches, mottled yellowish-brown and light-gray friable silt loam.
- 60 inches+, gray very firm plastic clay.

The texture of the pan ranges from silty clay loam to silty clay. In and below the pan layer are some cracks and seams filled with clay and silt.

Because the pan layer is near the surface, this soil is more droughty than the Dulac soils. The surface soil and subsoil are permeable, but the pan layer is only slightly permeable. Runoff is medium, and internal drainage is slow.

The soil is acid and low in organic matter, in plant nutrients, and in water-supplying capacity.

*Present use and management.*—All of this soil has been cropped. At present about two-thirds is in row crops or hay, and the rest is in unimproved pasture. Fertilizers are not generally used, and yields are low. Lespedeza, soybeans, sorghum, cotton, and corn are the principal crops.

*Management requirements.*—If properly managed this soil is suited to row crops. Good management practices include tilling on the contour, terracing, using sod waterways, and rotating crops. In the rotation, grasses and legumes should be grown about 3 out of every 4 years. Lime and fertilizer should be used according to needs indicated by soil tests.

This soil is suited to sorghum, soybeans, and small grains. Although cotton and corn are grown, the soil is generally not so well suited to them as to other crops. Hay and pasture crops to which the soil is suited are fescue, whiteclover, lespedeza, and bermudagrass. This soil is in capability unit IIIe-3.

**Cuthbert-Silerton soils, sloping phases (Cc).**—This complex consists of Cuthbert and Silerton soils so intermingled that it was not feasible to map them separately on a map of the scale used. The soils are well drained to moderately well drained. They occur on narrow, rolling ridgetops that have slopes of 5 to 8 percent. The Silerton soil has developed in thin (10 to 24 inches) loess that overlies sandy clay Coastal Plain material. The Cuthbert has developed in brittle, acid sandy clay Coastal Plain material, in many places interbedded with layers of gray clay. The soils are associated with other Cuthbert and Silerton soils and with Shubuta, Dulac, and Tippah soils. The soils have developed under deciduous forest consisting chiefly of oak, hickory, and beech.

Profile description (Cuthbert very fine sandy loam):

- 0 to 4 inches, dark yellowish-brown, very friable, very fine sandy loam; weak fine crumb structure.
- 4 to 12 inches, yellowish-brown friable clay loam; weak medium subangular blocky structure.
- 12 inches+, yellowish-red very firm sandy clay.

Profile description (Silerton silt loam):

- 0 to 7 inches, light yellowish-brown friable silt loam; weak medium subangular blocky structure.
- 7 to 20 inches, brown, firm, heavy silt loam; moderate medium blocky structure.
- 20 inches+, yellowish-red very firm sandy clay, splotted with light gray.

The uppermost few inches of the Cuthbert soil generally contains a considerable amount of silt. In both the Cuthbert and Silerton soils, sandstone fragments are common throughout the profile. A few areas of the Silerton soil have a weak pan and are only moderately well drained.

The soils are practically uneroded. They are acid and are moderately low in plant nutrients, in organic matter, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum appears to be less permeable. Runoff is medium, and internal drainage is medium to slow.

*Present use and management.*—Much of this mapping unit is in cutover hardwood forest consisting chiefly of oak, hickory, and beech. Frequent burning and removal of salable timber have reduced the quality of the stand,

and many of the remaining large trees are culls. Trees grow rather slowly on these soils.

*Management requirements.*—Because this complex occurs on narrow ridgetops and is isolated by soils undesirable for cropping, it is best left in trees. Measures to prevent fire are needed, and cull trees should be replaced. If cleared, the soils are best suited to hay and pasture. If row crops are grown, they should not be planted more than 1 year in every 4 or 5. Such practices as terracing, contouring, and establishing sod waterways are needed. For all crops, determine the need for lime and fertilizer by making soil tests.

The soils are suited to hay and pasture plants such as fescue, bermudagrass, orchardgrass, whiteclover, sericea lespedeza, and annual lespedeza. Cotton, peas, soybeans, and small grains will grow, but yields are generally low. These soils are in capability unit IVe-3.

**Cuthbert-Silerton soils, severely eroded sloping phases (Cd).**—This complex consists of well-drained upland soils. These occur on ridgetops that have slopes of 5 to 8 percent. The Silerton soil has developed in a thin layer (10 to 24 inches) of loess that overlies sandy clay Coastal Plain material. The Cuthbert soil has developed in sandy clay Coastal Plain material. The soils are in the same general areas as other Cuthbert and Silerton soils.

Severe erosion has removed more than 75 percent of the original surface soil. The dominant texture of the present plow layer ranges from silty clay loam in the Silerton soil to clay loam in the Cuthbert. A few areas are only moderately eroded. A few areas of the Silerton soil have a weak pan and are only moderately well drained.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum appears to be less permeable. Runoff is medium, and internal drainage is medium to slow.

*Present use and management.*—All areas of this mapping unit have been cropped, but about 60 percent is now idle or in wild pasture. About 30 percent is used for hay and summer pasture that consists chiefly of annual lespedeza. The remaining 10 percent is used largely for cotton, cowpeas, and soybeans. A few areas are in improved pasture consisting mainly of fescue and whiteclover. Crops commonly are not rotated or fertilized systematically, and yields of row crops are generally extremely low. As a rule, yields of summer pastures are low.

*Management requirements.*—Because this complex is droughty and severely eroded, it is best suited to permanent vegetation, mainly hay and pasture. Lime and fertilizer should be applied frequently in kinds and amounts indicated by soil tests. Unless grazing is limited during the dry summer months, the sod may be injured. Hay and pasture plants to which the soil is suited are fescue, whiteclover, bermudagrass, sericea lespedeza, and annual lespedeza. This complex is in capability unit VIe-3.

**Cuthbert-Silerton soils, strongly sloping phases (Ce).**—The soils of this complex are well drained. They occur on slopes of 8 to 12 percent. The Cuthbert soil has developed in sandy clay Coastal Plain material, and the Silerton soil in a thin layer (10 to 24 inches) of loess that overlies sandy clay Coastal Plain material. The complex occurs in the same general area as Cuthbert-Silerton soils, sloping phases. Generally the profile is thinner and not so well

developed in these soils on the stronger slopes. These soils were formed under deciduous forest.

A considerable amount of silt is mixed with the upper few inches of the Cuthbert soil. Most areas are uneroded, but a few areas are moderately eroded. The texture of the Silerton soil is silt loam. The texture of the Cuthbert soil ranges from silt loam to fine sandy loam.

These soils are acid. They are moderately low in organic matter and plant nutrients and low in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum appears to be less permeable. Runoff is medium to rapid, and internal drainage is medium.

*Present use and management.*—Practically all of this mapping unit is covered by deciduous hardwoods, chiefly oak, hickory, and beech. Removal of salable timber and frequent burning have reduced the quality of the present stand, and many of the large trees are culls. Trees grow at a moderately rapid rate on these soils.

*Management requirements.*—This complex is droughty and erodes rapidly when cleared. It is best left in trees. Cull trees should be replaced and fire-prevention measures adopted. If cleared, the complex is suited to pasture and hay. Lime and fertilizer should be applied frequently according to needs indicated by soil tests. Control of grazing during the dry summer months will help to prevent injury to the sod.

Among the hay and pasture plants suited to this complex are fescue, whiteclover, bermudagrass, sericea lespedeza, and annual lespedeza. This complex is in capability unit IVE-3.

**Cuthbert-Silerton soils, severely eroded strongly sloping phases (Cf).**—This complex of soils occurs on uplands that have slopes of 8 to 12 percent. The soils are well drained. The Cuthbert soil has developed in sandy clay Coastal Plain material, and the Silerton, in a thin layer (10 to 24 inches) of loess that overlies sandy clay Coastal Plain material. The soils occur throughout the county, mostly in the same general areas as Cuthbert-Silerton soils, sloping phases.

Generally in the areas on the stronger slopes, the profile is thinner and not so well developed as on milder slopes. More than 75 percent of the original surface layer has been lost through erosion. The dominant texture of the present plow layer ranges from silty clay loam in the Silerton soil to clay loam in the Cuthbert. The soils have developed under a deciduous forest.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum appears to be less permeable. Runoff is rapid, and internal drainage is medium.

*Present use and management.*—All of this complex has been cropped, but about 70 percent is now idle or in wild pasture. About 25 percent is in summer pasture consisting chiefly of lespedeza. The rest is used for cotton, cowpeas, soybeans, and other crops. A few areas are in improved pasture seeded chiefly to fescue and whiteclover. Yields of row crops and summer pastures are generally low. Crops generally are not rotated, nor are fertilizers used systematically.

*Management requirements.*—This complex is droughty and severely eroded. It is best suited to hay and pasture. It should be plowed or disked to prepare a seedbed. Lime and fertilizer should be applied frequently according to

needs indicated by soil tests. Control of grazing during the dry summer months will help protect the sod. Hay and pasture plants to which this complex is suited are fescue, whiteclover, bermudagrass, sericea lespedeza, and annual lespedeza. If the complex is not needed for hay or pasture, it is best kept in pine trees. It is in capability unit VIe-3.

**Cuthbert-Silerton soils, moderately steep phases (Cg and Ck).**—This complex occurs on hillsides that have slopes of 12 to 25 percent. Some is on slopes of more than 25 percent. The soils are well drained and have formed under a deciduous forest. The Cuthbert soil has formed in sandy clay Coastal Plain material, and the Silerton in a thin layer (10 to 24 inches) of loess that overlies sandy Coastal Plain material. The soils are in the eastern part of the county. They are associated with other Cuthbert and Silerton soils and with Dulac, Tippah, and Shubuta soils. Generally, as the degree of slope increases, the profiles become thinner and less well developed than in Cuthbert-Silerton soils, sloping phases.

Profile description (Cuthbert very fine sandy loam):

- 0 to 4 inches, dark yellowish-brown, very friable, very fine sandy loam; weak fine crumb structure.
- 4 to 10 inches, yellowish-brown friable clay loam; weak medium subangular blocky structure.
- 10 inches+, yellowish-red very firm, but brittle, sandy clay.

Profile description (Silerton silt loam):

- 0 to 5 inches, light yellowish-brown friable silt loam; very weak medium subangular blocky structure.
- 5 to 16 inches, brown, firm, heavy silt loam; moderate medium blocky structure.
- 16 inches+, yellowish-red very firm brittle sandy clay, splotched with light gray.

Sandstone fragments are scattered throughout the profile of these soils. In the upper few inches of some areas of Cuthbert soil, there is a considerable amount of silt.

Except for a few cleared areas that are moderately eroded, these soils are not eroded. The surface texture of the Silerton soil is silt loam, and that of the Cuthbert is silt loam or very fine sandy loam.

These soils are acid. They are moderately low to low in organic matter and plant nutrients and have a low water-supplying capacity. The surface soil and subsoil are permeable, but the substratum appears to be less permeable. Runoff is medium to rapid, and internal drainage is medium.

*Present use and management.*—Practically all of this mapping unit is in cutover forests of hardwoods. The trees are chiefly oak, hickory, beech, dogwood, and persimmon. Frequent burning and removal of salable timber have greatly reduced the quality of the stand, and most of the remaining large trees are culls. Trees grow fairly fast on these soils.

*Management requirements.*—This complex is droughty and subject to severe erosion when cleared, so it is best left in forest. Cull trees should be replaced and measures taken to prevent fire.

If cleared, the complex is suitable for hay and pasture. Except to prepare a seedbed, it should not be cultivated. Lime and fertilizer should be applied frequently according to needs indicated by soil tests. Grazing must be regulated to prevent injury to the sod during dry seasons. Hay and pasture plants to which this complex is suited are fescue, whiteclover, bermudagrass, sericea lespedeza,

and annual lespedeza. This complex is in capability unit VIe-3.

**Cuthbert-Silerton soils, severely eroded moderately steep phases** (Ch and Cl).—This complex consists of well-drained Cuthbert and Silerton soils so intricately mixed that it was not feasible to map them separately. The complex generally occupies slopes of 12 to 25 percent, but some is on steeper slopes. The Cuthbert soil has formed in sandy clay Coastal Plain material, and the Silerton in a thin layer (10 to 24 inches) of loess that overlies sandy clay Coastal Plain material. The soils of this complex differ from Cuthbert-Silerton soils, moderately steep phases, mainly in being more eroded. They have developed under deciduous forest.

More than 75 percent of the original surface layer has been lost through erosion. In places the subsoil and substratum are eroded. Shallow gullies are common in some areas. The dominant texture of the present plow layer of the Silerton soil is heavy silt loam, and of the Cuthbert soil, clay loam.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum appears to be less permeable. Runoff is very rapid, and internal drainage is medium.

*Present use and management.*—All of this complex has been cropped, but most is now idle or in wild pasture. Some areas are used for summer pasture that consists chiefly of lespedeza. Fertilizers are not generally used, and yields are low. The vegetation is generally not sufficient to check erosion.

*Management requirements.*—This complex is suited only to hay and permanent pasture or to other permanent vegetation. Except to prepare a seedbed, the soils should not be cultivated. Lime and fertilizer should be applied frequently according to needs indicated by soil tests. Grazing must be limited during the dry summer months to prevent injury to the sod.

This complex is suited to fescue, whiteclover, bermudagrass, sericea lespedeza, annual lespedeza, and similar hay and pasture plants. If not needed for hay or pasture, the complex should be planted to pine trees. It is in capability unit VIe-3.

**Dexter fine sandy loam, eroded gently sloping phase** (Dd).—This well-drained soil occurs on terraces that have slopes of 2 to 5 percent. It has developed in old mixed alluvium that washed from loess and from sandy Coastal Plain material. It has a sandier surface texture and is generally sandier throughout than Dexter silt loam, eroded gently sloping phase. Associated with this soil are Freeland, Hatchie, and Almo soils, other Dexter soils, and soils of the Hymon, Ina, and Beechy series on the bottom lands. This soil has developed under deciduous forest.

**Profile description:**

- 0 to 7 inches, dark-brown loose fine sandy loam; weak granular structure.
- 7 to 30 inches, dark reddish-brown loam; very weak medium subangular blocky structure.
- 30 inches+, dark-brown loose fine sandy loam grading to loose sand; slightly mottled with light gray.

This soil has lost from 0 to 75 percent of the surface soil, but nowhere has the loss been enough to alter substantially the use and management. The amount of sand

throughout the profile varies considerably from place to place.

This soil is medium acid. It is moderate in content of organic matter and plant nutrients and in water-holding capacity. It is highly permeable. In dry seasons the sandier areas tend to be droughty. Runoff and internal drainage are medium. Included in this mapping unit are well-drained, sandy, slightly or moderately eroded old colluvial soils on gentle slopes.

*Present use and management.*—Practically all areas are used for row crops. The principal crops are corn and cotton, but some soybeans, cowpeas, and lespedeza are grown. Crops are not commonly rotated. Although some fertilizer is used for cotton, fertilizers are not commonly used.

*Management requirements.*—This soil is suited to most crops common to the area. Rotations lasting 2 years or longer will give the best results. Row crops should be grown no more than 2 years in succession. If the soils are used for row crops, contour cultivation, terraces, and sodded waterways are generally needed. Fertilizer needs should be determined by soil tests.

This soil is suited to cotton, corn, soybeans, small grains, and truck crops. Many grasses and legumes can be grown for hay and pasture, including red, white, and crimson clovers, alfalfa, orchardgrass, fescue, and lespedeza. Grazing must be regulated during the dry summer months to protect the pasture sod. This soil is in capability unit IIe-1.

**Dexter fine sandy loam, eroded sloping phase** (De and Df).—This well-drained terrace soil occurs throughout the county on slopes of 5 to 8 or more percent. The soil has developed in old mixed alluvium washed from loess and sandy Coastal Plain material. It is associated with the same soils as Dexter fine sandy loam, eroded gently sloping phase. The soil developed under deciduous forest.

The amount of sand throughout the profile varies considerably from place to place, but the texture is generally sandier below the surface layer than in Dexter silt loam, sloping phase. The sandier areas are somewhat droughty.

This soil is medium acid. It is moderate to low in content of organic matter and plant nutrients and in water-holding capacity. It is highly permeable and somewhat droughty during the summer. Runoff is medium, and internal drainage is medium to rapid.

Areas of slightly or moderately eroded, well-drained, sandy, old colluvial soils are included in this mapping unit. These areas are on foot slopes of 5 to 8 percent, and some receive material from higher adjacent slopes.

*Present use and management.*—Practically all of this soil is used for crops, principally cotton, corn, soybeans, and lespedeza. Except for a light application of a complete fertilizer for cotton, the soil is not commonly fertilized nor are crops rotated. Yields are moderately low.

*Management requirements.*—Most areas of this soil are highly erodible. Hence, row crops should be grown only 1 year in a 3-year rotation that includes 2 years of close-growing crops. Cultivating on the contour, terracing, and sodding waterways are practices ordinarily needed. Fertilizer and lime needs are best determined by soil tests. This soil is well suited to hay and pasture. It needs frequent applications of fertilizer; and grazing should be controlled. Fertilizer needs are best determined by soil tests.

This soil is suited to most row crops commonly grown in the county, including sericea lespedeza, kudzu, small grains, crimson clover, fescue, and orchardgrass. Alfalfa and red clover will grow but require good management that includes liberal use of fertilizer. This soil is in capability unit IIIe-2.

**Dexter fine sandy clay loam, severely eroded gently sloping phase (Da).**—This brownish-red, well-drained soil occurs on second bottoms throughout the county. It occupies slopes of 2 to 5 percent. This soil has formed in old mixed alluvium washed from loess and sandy Coastal Plain materials. It differs from Dexter fine sandy loam, eroded gently sloping phase, mainly in being more eroded. It is associated with Freeland, Hatchie, Almo, and other Dexter soils and with bottom soils of the Hymon, Ina, and Beechy series. The soil has formed under deciduous forest.

At least 75 percent of the original surface soil and, in places, part of the subsoil has been lost through erosion. In some of the less eroded spots, the surface layer has a fine sandy loam texture.

This soil is medium acid. It is low in organic matter and moderate to low in plant nutrients and in water-holding capacity. The soil is highly permeable, and in dry seasons it is somewhat droughty, particularly in the sandier areas. Runoff and internal drainage are medium.

*Present use and management.*—All of this soil is cleared. Most is used for cotton, corn, and lespedeza, but yields are low. Except for cotton, fertilizer is not commonly used.

*Management requirements.*—This soil is suited to row crops, but it is slightly eroded. A 3-year rotation consisting of 1 year of row crops to at least 2 years of close-growing crops will help to protect it from further erosion. Cultivating on the contour, terracing, and using sodded waterways are practices commonly needed. The lime and fertilizer needs will best be determined by soil tests. Crop residues and cover crops need to be worked into the soil to help maintain or increase the amount of organic matter.

This soil is suited to cotton, corn, soybeans, and small grains. It is well suited to pasture and hay crops such as orchardgrass, fescue, white clover, crimson clover, kudzu, bermudagrass, sericea lespedeza, and other lespedezas. Overgrazing should be avoided and pastures fertilized often, using fertilizer in kinds and amounts indicated by soil tests.

Alfalfa and red clover can be grown, but heavy applications of fertilizer must be used and other good management practiced to obtain satisfactory yields. This soil is in capability unit IIIe-2.

**Dexter fine sandy clay loam, severely eroded sloping phase (Db and Dc).**—This well-drained soil of the second bottoms and terraces generally occupies slopes of 5 to 8 percent. Some occurs on slopes of 8 to 12 percent. The areas are scattered throughout the county. The soil has developed in old mixed alluvium washed from loess and sandy Coastal Plain materials. It differs from Dexter fine sandy loam, eroded sloping phase, mainly in being more eroded. Associated with this soil are Freeland, Hatchie, Almo, and other Dexter soils, and adjacent Hymon, Ina, and Beechy bottom soils.

At least 75 percent of the original surface soil and, in places, a large part of the subsoil has been lost through

erosion. The present plow layer consists of remnants of the original surface soil mixed with the subsoil. The resulting texture of the plow layer, in the less eroded areas, is typically fine sandy clay loam, but in places it is fine sandy loam. The amount of sand throughout the profile varies considerably from place to place.

This soil is medium acid. It is low in organic matter, in plant nutrients, and in water-holding capacity. It is highly permeable and is droughty. Runoff is medium, and internal drainage is medium to rapid. Some areas of sandy, well-drained soils formed from old colluvium are included in this mapping unit.

*Present use and management.*—Practically all of this soil has been cropped, though about 15 percent is now idle or in wild pasture. Cotton, corn, and lespedeza are the principal crops, but yields are low. Except for cotton, fertilizer is not generally used. Intensive use for row crops has caused severe erosion.

*Management requirements.*—This soil is severely eroded; therefore it is best suited to hay and pasture. Grasses and legumes should be grown for 5 or 6 years to 1 year of row crops. Tillage should be on the contour and waterways left in sod. Terraces may be needed. Lime and fertilizer needs should be determined by soil tests. Overgrazing must be avoided.

Except on the stronger slopes, this soil is suited to cotton, corn, sorghum, and other row crops. It is also suited to fescue, whiteclover, orchardgrass, kudzu, small grains, sericea lespedeza, and other lespedezas. It is in capability unit IVe-2.

**Dexter silt loam, eroded gently sloping phase (Dg and Dk).**—This brown, well-drained soil occurs on slopes of 2 to 5 percent. It occupies terraces and second bottoms throughout the county. Part of it has formed in shallow loess that overlies old alluvium washed from Coastal Plain materials, and part in old mixed alluvium that consists of loess and sandy Coastal Plain materials. It is associated with Freeland, Hatchie, Almo, and other Dexter soils.

*Profile description:*

- 0 to 8 inches, dark-brown very friable silt loam; very weak fine crumb structure.
- 8 to 30 inches, dark reddish-brown friable heavy silt loam; weak medium blocky structure.
- 30 inches+, dark-brown very friable fine sandy clay loam with a few light-gray splotches; the splotches increase in prominence with depth to water table.

The amount of sand in the profile varies considerably from place to place. Stratified sand is fairly common in the substratum. Some of this soil is moderately eroded, but erosion losses have not been large enough to alter significantly the use and management needs of the soil.

Areas are included in which 75 percent of the surface soil has been lost through erosion. The texture of the present plow layer ranges from silt loam in the less eroded spots to silty clay loam in the more eroded ones.

This soil is medium acid. It is generally moderately high in organic matter, in plant nutrients, and in water-supplying capacity. It is permeable. Runoff and internal drainage are medium. Well-drained old colluvial soils, formed from mixed loess and Coastal Plain materials, are included in this mapping unit.

*Present use and management.*—Practically all of this soil is used for crops, principally cotton, corn, soybeans, and lespedeza. Yields are moderately high to moderately

low. Ordinarily not much fertilizer is used, but complete fertilizer is commonly applied under cotton.

*Management requirements.*—This soil is suited to row crops grown in short rotations. The row crops should be grown not more than 2 years in succession and then rotated with grasses and legumes. In the severely eroded areas, after 1 year, row crops should be followed by 2 years of close-growing crops. When the soil is used for row crops, cultivating on the contour, terracing, and using grassed waterways are practices generally needed. Green-manure crops normally are required to maintain organic matter. Fertilizer needs are best determined by soil tests.

Except in the severely eroded areas, this soil is well suited to all the crops commonly grown, such as cotton, corn, soybeans, small grains, and truck crops. In most areas, many grasses and legumes can be grown for hay and pasture. Some of these are red, white, and crimson clovers, alfalfa, fescue, orchardgrass, and lespedezas. Grazing should be regulated and the pastures fertilized according to needs indicated by soil tests. This soil is in capability unit IIe-1.

**Dexter silt loam, sloping phase (Dh).**—This well-drained soil occurs on stream terraces that have slopes of 5 to 8 percent. It has developed in shallow loess over old alluvium and in old mixed alluvium. This old alluvium washed from loess and sandy Coastal Plain materials. This soil occurs in association with Freeland, Hatchie, Almo, and other Dexter soils along second bottoms throughout the county. It is also associated with the adjacent bottom soils.

*Profile description:*

- 0 to 6 inches, dark-brown very friable silt loam; very weak fine crumb structure.
- 6 to 30 inches, dark reddish-brown friable heavy silt loam to silty clay loam; weak medium blocky structure.
- 30 inches+, dark-brown very friable fine sandy clay loam with a few light-gray mottles; the mottles or splotches increase in prominence with increased depth to water table.

The amount of sand in the profile and substratum varies considerably from place to place.

Erosion losses range from slight to moderate. This soil is medium acid. It is moderately high in organic matter, in plant nutrients, and in water-supplying capacity. It is permeable. Runoff and internal drainage are medium.

Old, well-drained colluvial soils are included in this mapping unit.

*Present use and management.*—Practically all of this soil is used for row crops, principally cotton, corn, and lespedeza. Yields are moderate. Cotton receives applications of complete fertilizer, but other crops generally receive none.

*Management requirements.*—This soil is suited to row crops, but most of it is erodible. Suitable rotations consist of 1 year of row crops to 2 years of close-growing crops. Cultivating on the contour, terracing, and using sodded waterways are practices ordinarily needed. A few areas receive wash from nearby slopes, and here, diversions may be needed to intercept runoff. Fertilizer is best applied according to needs indicated by soil tests.

This soil is suited to cotton, corn, soybeans, cowpeas, and truck crops. It is also well suited to such hay and pasture crops as small grains, orchardgrass, alfalfa, red clover, white clover, fescue, kudzu, sericea lespedeza, and

annual lespedeza. Grazing should be regulated. This soil is in capability unit IIIe-2.

**Dexter silty clay loam, severely eroded sloping phase (Dl and Dm).**—This reddish-brown, well-drained soil occurs throughout the county on terraces that generally have slopes of 5 to 8 percent. Some slopes are 8 to 12 percent. It has formed on shallow loess over old alluvium and in old mixed alluvium. The old alluvium was washed from loess and sandy Coastal Plain materials. This soil has developed under deciduous forest. It differs from Dexter silt loam, sloping phase, in being more eroded. Associated with this soil are Freeland, Hatchie, Almo, and other Dexter soils and adjacent soils of the stream bottoms.

Some areas are only slightly or moderately eroded. In most areas, at least 75 percent of the original surface soil has been lost through erosion. The texture of the present plow layer ranges from silt loam to light silty clay loam. The amount of sand in the profile varies considerably from place to place.

This soil is medium acid. It is low in organic matter, in plant nutrients, and in water-holding capacity. It is permeable. Runoff is medium to rapid, and internal drainage is medium. In dry seasons the soil is droughty.

*Present use and management.*—All of this soil has been used for row crops. Cotton and corn are the principal crops. Much of this soil is now used for pasture or to grow lespedeza for hay. A few areas are now idle or in wild pasture. Fertilizer is not generally used for most crops, but cotton receives applications of complete fertilizer.

*Management requirements.*—This soil has been severely damaged by erosion. Consequently, it is best suited to close-growing hay and pasture crops. If row crops are grown, they should be followed by 5 or 6 years of grasses and legumes. Cotton or corn should not be grown more than 1 year in the rotation. The severely eroded areas should not be cultivated except to prepare a seedbed. Tillage is best done on the contour, and waterways should be left in sod. All crops should be fertilized according to their needs. Kinds and amounts of lime and fertilizer to use can be determined by soil tests.

This soil is suited to fescue, kudzu, small grains, orchardgrass, bermudagrass, white or red clover, sericea lespedeza, and common lespedeza. If lime and fertilizer needs are met, alfalfa will grow well on selected areas. Grazing should be regulated. If the stronger slopes are not needed for pasture, they should be planted to trees. This soil is in capability unit IVe-2.

**Dulac silt loam, eroded gently sloping deep phase (Dn).**—This is a moderately well drained siltpan soil of the uplands. It has developed in a moderately deep layer (42 to 60 inches) of loess that overlies acid sandy clay or clay Coastal Plain materials. It is associated with Tippah, Calloway, Cuthbert, and other Dulac soils.

*Profile description:*

- 0 to 6 inches, yellowish-brown very friable silt loam; weak fine crumb structure.
- 6 to 24 inches, brown firm heavy silt loam to light silty clay loam; moderate medium subangular blocky structure.
- 24 to 42 inches, (siltpan) mottled yellowish-brown, gray, and light olive-brown firm silty clay loam; strong coarse angular blocky structure.
- 42 inches+, dark-brown friable silt loam, mottled with yellowish brown; very hard when dry.

Erosion losses range from 0 to 75 percent of the surface soil. The soil is moderate to low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the siltpan and claypan are only slightly permeable. Runoff is medium, and internal drainage is slow.

Mapped with this soil and intermingled with it are areas in which there is a claypan instead of a siltpan. The loess below the claypan or siltpan is as much as 24 inches thick.

*Present use and management.*—About 80 percent of this soil is in crops. The rest is in forests of cutover hardwoods. Cotton, corn, lespedeza, small grains, soybeans, and cowpeas are the principal crops. Even in normal seasons, corn is usually damaged by drought. Because of moderately low yields and the difficulty of maintaining a stand during the dry summer months, alfalfa and kudzu are not generally grown. Fertilizers are not commonly used and, as a rule, yields are low.

*Management requirements.*—This soil is suited to crops that do not require large amounts of moisture. Increasing and maintaining the amount of organic matter in the soil will improve the moisture-holding capacity. Soil tests will indicate the kinds and amounts of fertilizers to be used. Row crops can be grown but not more than one-half the time or more than 2 years in succession. They should be followed by pasture. Cultivation should be on the contour, and waterways left in sod. Terraces may be needed to help prevent erosion.

This soil is suited to small grains, cotton, sorghum, soybeans, and cowpeas. It is also suited to such hay and pasture crops as fescue, vetch, orchardgrass, bermudagrass, white clover, crimson clover, and lespedeza. It is in capability unit IIe-2.

**Dulac silt loam, sloping deep phase (Do).**—This moderately well drained pan soil of the uplands occurs on slopes of 5 to 8 percent. It has developed in a moderately deep layer (40 to 60 inches) of loess that overlies acid sandy clay or clay Coastal Plain materials. It is in the same general area as Tippah, Calloway, Cuthbert, and other Dulac soils.

Profile description:

- 0 to 6 inches, yellowish-brown friable silt loam; weak fine crumb structure.
- 6 to 22 inches, brown firm heavy silt loam; moderate medium subangular blocky structure.
- 22 to 40 inches, mottled yellowish-brown, gray, and light olive-brown firm silty clay loam; strong coarse angular blocky structure.
- 40 inches+, brown to dark-brown friable silt loam, mottled with yellowish brown; very hard when dry.

This soil is moderate to low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Runoff is medium, and internal drainage is slow.

Mapped with this soil are some areas in which there is a claypan as well as a siltpan. These areas are so intricately mixed with the typical soil that it was not feasible to separate them on a map of the scale used. The loess below the siltpan ranges from 12 to 24 inches in thickness, and that below the claypan, up to 24 inches.

*Present use and management.*—Practically all of this soil is in cutover forest that consists mainly of oaks and hickories. Frequent burning and grazing on many areas

have lowered the quality of the timber. Trees grow at a moderate rate.

*Management requirements.*—If cleared, this soil is suited to many drought-resistant crops. A 3-year rotation in which the row crop is followed by 2 years of close-growing grasses and legumes is needed to prevent erosion. Need for fertilizer should be determined by soil tests. If the soil is cultivated, terraces or stripcropping, or both, are generally needed to help prevent erosion.

The soil is suited to small grains, vetch, crimson clover, bermudagrass, sericea lespedeza, and annual lespedeza. Because they need considerable moisture, alfalfa and kudzu will probably not grow well. This soil is in capability unit IIIe-1.

**Dulac silt loam, eroded sloping deep phase (Dp).**—This moderately well drained pan soil occurs on slopes of 5 to 8 percent. It has developed in a moderately deep layer (42 to 60 inches) of loess that overlies clay or sandy clay Coastal Plain materials. This soil occurs in the same general area as Tippah, Calloway, Cuthbert, and other Dulac soils. It has formed under deciduous forest.

Profile description:

- 0 to 6 inches, yellowish-brown friable silt loam; weak fine crumb structure.
- 6 to 22 inches, brown friable to firm heavy silt loam; moderate medium subangular blocky structure.
- 22 to 40 inches, (siltpan) mottled yellowish-brown, gray, and light olive-brown firm silty clay loam; strong coarse angular blocky structure.
- 40 inches+, brown to dark-brown friable silt loam, mottled with yellowish brown; very hard when dry.

Thickness of the pan ranges from 8 to 16 inches. The thickness of the loess below the siltpan ranges from 12 to 24 inches.

This soil has lost between 25 and 75 percent of its surface layer. The losses have not been great enough to alter the texture of the surface layer substantially.

This soil is acid. It is low in organic matter and moderately low in plant nutrients and in water-supplying capacity. The surface layer and subsoil are permeable, but the pan is only slightly permeable. Runoff is medium, and internal drainage is slow.

In some areas included in this mapping unit, the soils have a claypan rather than a siltpan. The siltpan and claypan soils are intermingled. The thickness of the loess below the claypan ranges up to 24 inches.

*Present use and management.*—All of this soil is cleared, and most of it is cropped. Cotton, corn, and lespedeza are the principal crops. Even in normal seasons, corn usually is damaged by drought. Stands of alfalfa and kudzu are difficult to maintain, and yields are moderately low. Intensive use for row crops without applying adequate soil amendments is depleting the soil of organic matter and plant nutrients. Under present management erosion is active in most areas.

*Management requirements.*—This soil is suited to most of the drought-resistant crops commonly grown in the area. The amount of organic matter and fertility can be increased and maintained by fertilizing properly and by using a 3-year rotation. Row crops grown for 1 year should be followed by 2 years of close-growing grasses and legumes. Cultivating on the contour and leaving waterways in sod will help to prevent erosion. Terracing, stripcropping, or both are generally needed.

This soil is suited to small grains, vetch, cotton, soybeans, sorghum, cowpeas, orchardgrass, bermudagrass,

fescue, crimson clover, white clover, sericea lespedeza, and other lespedezas. It is in capability unit IIIe-1.

**Dulac silt loam, strongly sloping deep phase (Dr).**—This moderately well drained pan soil occurs on ridge slopes of 8 to 12 percent. It has developed in a moderately deep layer (42 to 60 inches) of loess that overlies sandy clay and clay Coastal Plain materials. It is in the same general area as Tippah, Calloway, Cuthbert, and other Dulac soils. Some of this soil is more eroded than Dulac silt loam, sloping deep phase.

Profile description:

- 0 to 6 inches, yellowish-brown friable silt loam; weak fine crumb structure.
- 6 to 24 inches, brown to dark-brown friable to firm heavy silt loam; moderate medium subangular blocky structure.
- 24 to 40 inches, (siltpan) mottled yellowish-brown, gray, and light olive-brown firm silty clay loam; strong coarse angular blocky structure.
- 40 inches+, brown to dark-brown friable silt loam, mottled with yellowish brown; very hard when dry.

Thickness of the siltpan ranges from 8 to 16 inches. The loessal material below the pan ranges from 12 to 24 inches. Up to 75 percent of the original surface soil has been lost through erosion. The losses have not been great enough to alter materially the texture of the plow layer.

This soil is moderately low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Runoff is medium to rapid, and internal drainage is slow.

Mapped with this soil are some areas of claypan soils. In these included soils, the loess below the claypan ranges up to 24 inches in thickness.

*Present use and management.*—Most of this soil is in cutover forest, and the rest is cultivated. Frequent burning has reduced the quality of the timber, and many of the larger trees are culls. In cropped areas erosion is active. Corn, cotton, and lespedeza are the principal crops, and yields are low. In a normal season corn and other crops that require moisture are damaged by drought.

*Management requirements.*—This soil is droughty and highly erodible when cleared. It is best suited to hay and pasture. If necessary to the farming program, the soil can be row cropped but not more than once every 6 years. If cultivated, tilling on the contour, terracing, using sod waterways, and stripcropping may be needed to control erosion. Lime and fertilizer needs for both row crops and close-growing crops should be determined. Pasture management should include weed clipping and regulated grazing in addition to using frequent applications of fertilizer.

This soil is suited to cotton, soybeans, sorghum, small grains, vetch, ryegrass, bermudagrass, orchardgrass, fescue, crimson clover, white clover, sericea lespedeza, and annual lespedeza. It is in capability unit IVe-1.

**Dulac silty clay loam, severely eroded gently sloping deep phase (Ds).**—This moderately well drained pan soil of the uplands occurs on broad ridgetops that have slopes of 2 to 5 percent. It has developed in a moderately deep layer (42 to 60 inches) of loess that overlies acid sandy clay or clay Coastal Plain materials. The soil occurs in the same general area as Cuthbert, Tippah, Calloway, and other Dulac soils. It has developed under a deciduous forest.

Profile description:

- 0 to 6 inches, yellowish-brown, firm to friable, light silty clay loam; very weak medium subangular blocky structure.
- 6 to 20 inches, brown firm light silty clay loam; moderate medium subangular blocky structure.
- 20 to 38 inches, mottled yellowish-brown, gray, and light olive-brown firm silty clay loam; strong coarse angular blocky structure.
- 38 inches+, (siltpan) dark-brown friable silt loam mottled with yellowish brown; very hard when dry.

In some areas there is a claypan rather than a siltpan. The soil within such areas is so intermingled with the typical soil it was not feasible to separate the two soils on a map of the scale used. The loess underneath the claypan is as much as 24 inches thick.

At least 75 percent of the original surface soil has been lost through erosion. Therefore, the present plow layer consists of remnants of the original surface soil mixed with the subsoil. Its texture ranges from silt loam to light silty clay loam.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—All of this soil has been cropped. A small part is now idle or in wild pasture. Intensive row cropping is the general practice, and the risk of further erosion is high. Corn, cotton, and lespedeza are the principal crops, but yields are low. In normal seasons corn is usually damaged by drought. Because of low yields and difficulty in maintaining a stand, alfalfa and kudzu generally do not grow well. Fertilizer is not commonly used.

*Management requirements.*—This soil is suited to crops, but good management is needed to prevent further erosion. Row crops are best followed by winter cover crops and then by 2 years of close-growing grasses and legumes. Organic matter and the supply of plant nutrients should be kept high by adding manure, commercial fertilizer, and lime and by selecting crops to which the soil is suited. Soil tests will indicate the kinds and amounts of lime and fertilizer needed. Cultivating should be done on the contour, and waterways left in sod. If the soil is cultivated, terracing, stripcropping, or both are generally needed to help prevent erosion.

This soil is suited to small grains, vetch, crimson clover, and to drought-resistant crops such as cotton, soybeans, sorghum, and cowpeas. It is also suited to many grasses and legumes grown for hay and pasture. These include fescue, whiteclover, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. This soil is in capability unit IIIe-1.

**Dulac silty clay loam, severely eroded sloping deep phase (Dt).**—This pan soil of the uplands is only moderately well drained. It has developed in a moderately deep layer (42 to 60 inches) of loess that overlies clay or sandy clay Coastal Plain materials. Associated with this soil are Cuthbert, Calloway, Tippah, and other Dulac soils.

Profile description:

- 0 to 6 inches, brown friable heavy silt loam; weak medium subangular blocky structure.
- 6 to 20 inches, brown, friable to firm, heavy silt loam; moderate medium subangular blocky structure.

20 to 38 inches, (siltpan) mottled yellowish-brown, gray, and light olive-brown firm silty clay loam; strong coarse angular blocky structure.

38 inches+, brown to dark-brown friable silt loam, mottled with yellowish brown; very hard when dry.

In some areas there is a claypan rather than a siltpan in the profile. This soil is intermingled with the typical soil. In some places there is no loess beneath the claypan. In others, the loess is as much as 24 inches thick. Underneath the siltpan, the loess is between 12 and 24 inches thick. Thickness of the pan ranges from 8 to 16 inches. Severe sheet erosion has washed away so much of the surface soil that the pan is near the surface. More than 75 percent of the original surface soil has been lost. In most areas the texture of the present plow layer is substantially heavier than that of the original surface layer.

This soil is low in organic matter, in plant nutrients, and in water-supplying capacity. It is droughty. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Runoff is medium to rapid, and internal drainage is slow.

*Present use and management.*—All of this soil has been cultivated. About one-half is now cropped, and yields are low. The rest is idle or in wild pasture. In normal seasons corn usually is damaged by drought. Because of moderately low yields and difficulty in maintaining a stand, alfalfa and kudzu are not generally grown. Fertilizer is not commonly used. Under the present management, erosion is active.

*Management requirements.*—This soil is best suited to hay and pasture. Nevertheless, if cultivated crops are needed, they can be grown about 1 year out of every 6. If the soil is cultivated, it should be tilled on the contour, terraced, and stripcropped, and sodded waterways used to control erosion. The need for lime and fertilizer is ordinarily great. Soil tests will indicate the kinds and amounts to use.

Pasture management should include regulating grazing, clipping weeds, and fertilizing frequently. Hay and pasture crops to which the soil is suited are fescue, white-clover, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. The soil is also suited to small grains, vetch, crimson clover, and to drought-resistant crops such as cotton, soybeans, and sorghum. This soil is in capability unit IVE-1.

**Dulac silty clay loam, severely eroded strongly sloping deep phase (Du).**—This moderately well drained pan soil of the uplands occurs on slopes of 8 to 12 percent. It has developed in moderately deep (42 to 60 inches) loess that overlies sandy clay and clay Coastal Plain materials. It is in the same general area and associated with the same soils as Dulac silt loam, strongly sloping deep phase.

Profile description:

0 to 6 inches, yellowish-brown to brown, friable, heavy silt loam; weak medium subangular blocky structure.

6 to 20 inches, brown, friable to firm, heavy silt loam; moderate medium subangular blocky structure.

20 to 36 inches, (siltpan) mottled yellowish-brown, gray, and light olive-gray firm silty clay loam; strong coarse angular blocky structure.

36 inches+, brown to dark-brown, friable silt loam; very hard when dry.

Mapped with this soil are small areas in which there is a claypan rather than a siltpan. In some places the claypan lies directly over clay, but generally 12 inches or more of

loessal material is between the pan and the Coastal Plain material.

The present plow layer consists of remnants of the original surface soil mixed with the subsoil. Consequently, its texture is appreciably finer than that of the original surface layer.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-supplying capacity. Because of severe sheet erosion, the pan is near the surface and the soil is droughty. Runoff is rapid, and internal drainage is medium.

*Present use and management.*—All of this soil has been row cropped, but about one-half is now idle or in wild pasture. The wild pasture consists mainly of bushes, wild grasses, and weeds, and a sparse stand of lespedeza and hop clover. Row cropping is usually intensive and practiced without adequate use of fertilizer and measures to control erosion. The principal crops are cotton, corn, and lespedeza. Yields are low, and erosion is active.

*Management requirements.*—As it is severely eroded and erodible, this soil is best used for permanent pasture or other permanent vegetation. Except in preparing a seedbed, it should not be plowed or disked, and all tillage should be on the contour. Pastures must not be overgrazed. Soil tests will indicate the kinds and amounts of fertilizer needed.

This soil is suited to such hay and pasture plants as fescue, ryegrass, whiteclover, sericea lespedeza, and other lespedezas. If the soil is not needed for pasture, it is best to plant it to pines. It is in capability unit IVE-1.

**Dulac-Cuthbert soils, severely eroded strongly sloping phases (Dv and Dw).**—This complex occupies slopes chiefly of 8 to 12 percent. Some of it is on slopes of 5 to 8 percent. The Dulac soil has developed in a thin layer (20 to 42 inches) of loess that overlies sandy clay Coastal Plain materials. The Cuthbert has developed in sandy clay Coastal Plain materials. The soils are in the same general area as the Tippah, Calloway, and other Dulac and Cuthbert soils. Generally, on the stronger slopes the pan layer in the Dulac soil is thinner and not so well developed as on the milder slopes. The soils have developed under deciduous forest.

Profile description (Dulac silt loam):

0 to 6 inches, yellowish-brown very friable silt loam; weak fine crumb structure.

6 to 22 inches, brownish-yellow friable to firm heavy silt loam; moderate medium blocky structure.

22 to 35 inches, (siltpan) mottled yellowish-brown and light-gray compact silty clay loam; coarse angular blocky structure.

35 inches+, mottled strong-brown, yellowish-red, and pale-yellow very firm brittle sandy clay.

Profile description (Cuthbert sandy clay loam):

0 to 6 inches, light yellowish-brown friable very fine sandy clay; weak medium subangular blocky structure.

6 to 10 inches, reddish-yellow brittle very fine sandy clay; moderate medium blocky structure.

10 inches+, mottled or streaked reddish-yellow and gray sandy clay, or laminated beds of light-gray clay and yellow sandy material.

More than 75 percent of the original surface layer has been lost through erosion. In many places the soils are eroded almost to the pan or substratum. As a result, the texture of the present plow layer ranges from a heavy silt loam in the Dulac soil to sandy clay in the Cuthbert.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan layer and substratum are only slightly permeable. Runoff is medium to rapid, and internal drainage is slow.

*Present use and management.*—All of this complex has been cropped, but about 80 percent is now idle or in wild pasture. The rest is used for row crops, mainly corn, cotton, cowpeas, soybeans, oats, and lespedeza for hay and pasture. Alfalfa and kudzu do not grow well. Crops are not commonly rotated or fertilized systematically, and yields are extremely low.

*Management requirements.*—These droughty soils are severely eroded. It is best to use them only for hay and pasture or for other permanent vegetation. The soils should be tilled only to prepare the seedbed, and tillage should be on the contour. Lime and fertilizer are best applied according to needs indicated by soil tests.

On the milder slopes, this complex is suited to cotton, soybeans, cowpeas, and other row crops. Some areas are suited to small grains. Some of the pasture plants to which these soils are suited are sericea lespedeza, fescue, whiteclover, and bermudagrass. If the soils are not needed for hay and pasture, pine trees should be planted. This complex is in capability unit VIe-3.

**Dulac-Cuthbert soils, moderately steep phases (Dx and Dy).**—This complex of intermingled Dulac and Cuthbert soils occupies ridge slopes of 12 to 25 percent. The Dulac soil has developed in a thin layer (20 to 42 inches) of loess that overlies sandy clay Coastal Plain materials. The Cuthbert soil has developed in sandy clay Coastal Plain materials. This complex is in the same general area as Dulac-Cuthbert soils, severely eroded strongly sloping phases. Generally on the stronger slopes the profiles are thinner and not so well developed as on the milder slopes. The soils have developed under a deciduous forest consisting mainly of oak, hickory, and gum.

In most areas the soils of this complex have lost less than 25 percent of the original surface layer through erosion. Some areas are severely eroded. The texture of the surface soil ranges from silt loam in the Dulac soil to fine sandy loam in the Cuthbert. In most areas of the Cuthbert soil, the upper few inches contains a considerable amount of silt.

The complex is acid. It is moderately low to low in organic matter and is low in plant nutrients and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan and substratum are only slightly permeable. Surface runoff is rapid, and internal drainage is slow.

*Present use and management.*—All of the uneroded areas of this complex are in forest that consists mainly of oak, hickory, gum, sourwood, and beech. Most areas have been cut over at least once and have been burned frequently. As a result many of the remaining large trees are culls. Trees grow at a moderately slow rate.

All of the severely eroded areas have been cropped, but practically all are now idle or in wild pasture. The present vegetation is generally not sufficient to stop erosion.

*Management requirements.*—As this complex is droughty, low in natural fertility, and subject to severe erosion when cleared, it should remain in forest. The trees need protection from fire, and cull trees should be replaced.

If cleared, this complex is suited to pasture. Tillage is best done on the contour, and the soils should be tilled only when preparing the seedbed. Lime and fertilizer should be applied frequently according to needs indicated by soil tests. Overgrazing must be avoided during the dry summer months.

This complex is suited to such pasture and hay crops as fescue, whiteclover, bermudagrass, sericea lespedeza, and annual lespedeza. It is in capability unit VIe-3.

**Dulac and Tippah silt loams, gently sloping phases (Dz).**—These pan soils of the uplands are moderately well drained. They occur in such an intricate pattern that it was not feasible to map them separately.

The soils occur on ridgetops that have slopes of 2 to 5 percent. They have developed in a thin layer (20 to 42 inches) of loess that overlies Coastal Plain materials. The main difference between the two soils is in the texture of the underlying materials. The Dulac is underlain by sandy clay and the Tippah by gray, firm clay. The soils are associated with Silerton, Cuthbert, Shubuta, Ruston, and with other intermingled Dulac and Tippah soils in the eastern part of the county, and with Cuthbert, Calloway, Dulac, and other intermingled Dulac and Tippah soils in the western part of the county.

Profile description of Dulac silt loam:

- 0 to 6 inches, dark grayish-brown friable silt loam; weak fine crumb structure.
- 6 to 24 inches, yellowish-brown, friable to firm, heavy silt loam; weak medium subangular blocky structure.
- 24 to 40 inches, (siltpan) mottled yellowish-brown, dark-brown, and light-gray firm silty clay loam; coarse angular blocky structure; many small brown concretions.
- 40 inches+, mottled strong-brown, yellowish-red, and pale-yellow brittle sandy clay; the underlying material ranges from brittle sandy clay to very thin (1 inch or less) layers of sand and clay.

In some areas some loessal material (less than 8 inches) lies beneath the Dulac pan.

Profile description of Tippah silt loam:

- 0 to 6 inches, brown to dark grayish-brown friable silt loam; weak fine crumb structure.
- 6 to 24 inches, yellowish-brown, friable to firm, heavy silt loam; weak medium subangular blocky structure.
- 24 to 34 inches, (siltpan) mottled yellowish-brown, dark-brown, and light-gray firm silty clay loam; contains common small dark-brown concretions; coarse angular blocky structure.
- 34 inches+, mottled yellowish-red, olive, and gray firm clay.

The pan is not generally so well developed where it occurs below a thin layer of loess as where it underlies a thick layer.

These soils are only slightly eroded. They are acid soils that have a moderate supply of organic matter and plant nutrients and a moderately low water-supplying capacity. The surface soil and subsoil are permeable, but the pan layer is only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—About 75 percent of the acreage is cropped; the rest is in forest of cutover hardwoods, chiefly oak, hickory, and beech. Frequent burning and removal of salable timber have reduced the quality of the stand, and many of the remaining trees are culls. Generally, the trees grow in small areas isolated by soils that are undesirable for cropping.

The principal crops are cotton, corn, and lespedeza. Cotton yields are moderately high. Corn yields are generally low, even in normal seasons, because of lack of moisture. It is hard to maintain stands of alfalfa and

kudzu, so they are not generally grown. The row crops are grown intensively. Ordinarily, complete fertilizer is used only for cotton.

*Management requirements.*—This mapping unit is limited in use by being somewhat droughty. It is most productive when a large amount of organic matter is kept in the soil. This can be done by carefully selecting crops, planting cover crops, and applying lime and fertilizer liberally. Row crops can be grown as much as one-half the time but not more than 2 years in succession. Plowing should be done on the contour, and waterways need to be sodded. Terraces may be needed to help prevent erosion. If pastures are not overgrazed, permanent ground cover can be maintained more readily (figs. 5 and 6).

This mapping unit is suited to small grains, cotton, soybeans, cowpeas, and sorghum. It is also suited to many grasses and legumes, such as vetch, fescue, crimson clover, white clover, orchardgrass, bermudagrass, sericea lespedeza, and annual lespedeza. It is in capability unit IIe-2.

**Dulac and Tippah silt loams, eroded gently sloping phases (D1a).**—These soils occur on broad ridgetops



Figure 5.—General farming on Dulac and Tippah soils.



Figure 6.—Improved pasture on Dulac, Tippah, and Calloway soils.

that have slopes of 2 to 5 percent. They occur in such an intricate pattern that it was not feasible to map them separately. These yellowish-brown, moderately well drained pan soils have developed in a thin layer of loess that overlies Coastal Plain materials. The main difference between the two soils is in the underlying Coastal Plain materials. The Dulac is underlain by sandy clay, and the Tippah, by heavy plastic clay. The soils differ from Dulac and Tippah silt loams, gently sloping phases, mainly in having lost 25 to 75 percent of the original surface layer through erosion. Associated with these soils are Silerton, Cuthbert, Shubuta, Ruston, and other Dulac and Tippah soils. The native vegetation was deciduous forest.

These soils are acid. They are moderately low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan layers are only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—All areas of these soils have been cleared. Most are cropped intensively, mainly to cotton, corn, lespedeza, soybeans, and sorghum, but yields are moderately low. Corn is usually damaged by lack of moisture. Because of the difficulty of maintaining a stand, alfalfa and kudzu are not commonly grown. Ordinarily, crops are not rotated systematically, but many farmers use vetch as a cover crop between cotton plantings. Complete fertilizer is applied under cotton, but other than that little fertilizer is used.

*Management requirements.*—Droughtiness in summer limits the use of this mapping unit. The soils need to have the content of organic matter kept as high as possible by planting green-manure crops and by applying amendments liberally. Soil tests will indicate the kinds and amounts of lime and fertilizer needed. Row crops can be grown as much as half the time but for not more than 2 consecutive years. Cover crops should always follow them. Tilling on the contour and using sod waterways and terraces are practices generally needed. Pastures must not be overgrazed.

The soils are suited to cotton, soybeans, and sorghum. They are also suited to many grasses and legumes, such as vetch, crimson clover, white clover, small grains, ryegrass, orchardgrass, bermudagrass, fescue, sericea lespedeza, and other lespedezas. This mapping unit is in capability unit IIe-2.

**Dulac and Tippah silt loams, sloping phases (D1b).**—These soils occur on ridgetops that have slopes of 5 to 8 percent. They occur in such an intricate pattern that it was not feasible to map them separately. Both soils have developed in a thin layer of loess. In the Dulac soils the loess overlies sandy clay Coastal Plain materials, and in the Tippah it overlies plastic clay Coastal Plain materials. The soils are moderately well drained and have a siltpan in the profile. They are associated with Silerton, Cuthbert, Shubuta, Ruston, and with other Dulac and Tippah soils in the eastern part of the county, and with Calloway, Dulac, and Cuthbert soils in the western part of the county. The native vegetation consisted of deciduous trees.

These soils are acid. They are moderately low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan layer is only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—Most areas of these soils are in forest of cutover hardwoods, mainly oaks. Frequent burning and the removal of salable timber have reduced the quality of the stand, and many of the remaining large trees are culls. A few areas have been cleared recently and used for crops and pastures, but yields are moderately low. Even in a normal season, corn usually is damaged by drought. Because it is hard to maintain a stand, alfalfa and kudzu are not generally grown. Fertilization is normally light. On most of the cleared areas, erosion is active.

*Management requirements.*—If these soils are left in forest, the trees must be protected from fire and undesirable trees replaced. If the soils are cleared and used for pasture or crops, tilling on the contour, stripcropping, and using terraces and sodded waterways are practices generally needed. It is best to follow a row crop immediately by a winter cover crop and then by 2 years of grasses and legumes. Soil tests will indicate the need for lime and fertilizer. If the soils are pastured, avoid overgrazing during the dry summer months.

These soils are suited to small grains, vetch, crimson clover, cotton, soybeans, and sorghum. They are also suited to many grasses and legumes for hay and pasture, including fescue, whiteclover, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. This mapping unit is in capability unit IIIe-1.

**Dulac and Tippah silt loams, eroded sloping phases (Dlc).**—These are moderately well drained siltpan soils. They occupy ridgetops that have slopes of 5 to 8 percent. They occur in such an intricate pattern that it was not feasible to map them separately. These soils have developed in loess that in most places is less than 42 inches thick. In the Dulac soil the loess overlies sandy clay Coastal Plain materials and in the Tippah, plastic clay Coastal Plain materials.

These soils are associated with Silerton, Cuthbert, Shubuta, Calloway, and Ruston soils. In all areas where this mapping unit occurs, the soils are associated with other Dulac and Tippah soils. They have developed under deciduous forest.

The degree of development of the silty pan in the Tippah soil ranges from slight to moderate. Where the pan is thinnest, the loess is generally less than 24 inches thick. Consequently, the plastic clay is nearer the surface and has about the same effect as a pan in restricting water movement.

From 25 to 75 percent of the original surface soil has been lost through erosion. The loss, however, has not been great enough to alter substantially the use and management of the soils.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—All of these soils are used for crops, principally cotton, corn, and lespedeza, but yields are moderately low. Ordinarily, crops are not rotated systematically. Complete fertilizer is used for cotton, but in general fertilizers are not used. In a normal season, corn is usually damaged by drought. Alfalfa and kudzu are not commonly grown, because it is hard to maintain a stand.

*Management requirements.*—This mapping unit is limited in use by being droughty and extremely erodible. Organic matter should be kept as high as possible by carefully selecting crops and by using amendments. Need for lime and fertilizer can be determined by soil tests. Row crops are best followed by a winter cover crop and at least 2 years of close-growing grasses and legumes. Tillage should be on the contour, and waterways left in sod. If the soils are cultivated, terracing, stripcropping, or both, are generally needed to help prevent erosion. If they are pastured, grazing should be limited during the dry summer months.

This mapping unit is suited to cotton, sorghum, soybeans, cowpeas, small grains, vetch, crimson clover, white clover, fescue, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. It is in capability unit IIIe-1.

**Dulac and Tippah silty clay loams, severely eroded gently sloping phases (Dlf).**—These moderately well drained soils occur on ridgetops that have slopes of 2 to 5 percent. They occur in such an intricate pattern that it was not feasible to map them separately. The soils have developed in loessal material that is up to 42 inches thick. The Dulac soil overlies sandy clay, and the Tippah, plastic clay. Both soils have silt pans. They are associated with Silerton, Cuthbert, Shubuta, and Ruston soils in the eastern part of the county and elsewhere with Dulac, Tippah, Calloway, and Cuthbert soils.

These soils differ from Dulac and Tippah silt loams, gently sloping phases, in having lost at least 75 percent of the original surface layer through erosion. In many places the subsoil is eroded. The texture of the present plow layer is silty clay loam, but it is generally a little heavier than that of the original surface soil.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-holding capacity. Permeability of the surface soil and subsoil is high, but the pan is only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—These soils have been used intensively for row crops. The principal crops are cotton, corn, lespedeza, soybeans, and sorghum. Yields are low. In the dry summer months, corn is usually damaged by drought, and it is difficult to maintain stands of alfalfa and kudzu. Although complete fertilizer is used where cotton is grown, fertilizers are not commonly used.

*Management requirements.*—Because this mapping unit is severely eroded and droughty, row crops should be grown only in moderately long rotations. At least 2 years of close-growing grasses and legumes should follow each year of row crops. It is best to keep the organic matter high by seeding cover crops and applying amendments liberally. Lime and fertilizer needs can be determined by soil tests. Cultivating should be on the contour and waterways left in sod. Terraces, stripcropping, or both, are generally needed. If the soils are pastured, grazing needs to be limited during the summer months.

This mapping unit is suited to cotton, soybeans, cowpeas, sorghum, small grains, vetch, crimson clover, white clover, fescue, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. It is in capability unit IIIe-1.

**Dulac and Tippah silty clay loams, severely eroded sloping phases (D1g).**—These moderately well drained siltpan soils are on upland slopes of 5 to 8 percent. They occur in such an intricate pattern that it was not feasible to separate them on a map of the scale used. They differ from the Dulac and Tippah silt loams, eroded sloping phases, mainly as a result of being more eroded. The soils have developed in a thin layer (20 to 42 inches) of loess that overlies Coastal Plain materials. The Dulac soil overlies sandy clay, and the Tippah overlies heavy plastic clay. The soils are associated with Silerton, Cuthbert, Shubuta, Ruston, and other Dulac and Tippah soils in the eastern part of the county, and with Cuthbert and other Dulac and Tippah soils elsewhere.

The present plow layer consists of remnants of the original surface layer mixed with the subsoil. It has a substantially heavier texture than that of the original surface soil.

These soils are acid. They are droughty and are very low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Run-off is medium to rapid, and internal drainage is slow.

*Present use and management.*—All of these soils have been cropped, though about 25 percent is now idle or in wild pasture. Cotton, corn, and lespedeza are the principal crops. Yields are low. Corn is usually damaged by drought. Generally crops are not rotated systematically, and fertilizers are not generally used. Complete fertilizer is commonly applied, however, under cotton.

*Management requirements.*—This mapping unit is best suited to hay and pasture. If row crops are needed, they can be grown about once every 6 years. Cultivating should be done on the contour and waterways left in sod. If the soils are cultivated, terracing, stripcropping, or both are generally needed. Lime and fertilizer needs can be determined by soil tests. Overgrazing is to be avoided during the dry summer months.

This mapping unit is suited to such hay and pasture crops as orchardgrass, bermudagrass, fescue, whiteclover, sericea lespedeza, and other lespedezas. It is also suited to small grains, vetch, crimson clover, and drought-resistant crops such as cotton, soybeans, and sorghums. It is in capability unit IVe-1.

**Dulac and Tippah silty clay loams, severely eroded strongly sloping phases (D1d, D1e, and D1h).**—These moderately well drained pan soils of the uplands occupy slopes of 8 to 12 percent. They occur in such an intricate pattern that it was not feasible to map them separately. They have developed in thin layers of loess that are in most places less than 42 inches thick. The Dulac soil overlies sandy clay Coastal Plain materials, and the Tippah, heavy plastic clay Coastal Plain materials. These soils are in the same general areas as other Dulac and Tippah soils. In most areas they have lost more than 75 percent of their surface layer through erosion. In many places the subsoil is eroded. The present plow layer is generally heavier in texture than the original surface layer.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The layers above the pan are permeable, but the pan is only slightly permeable. Runoff is medium to rapid and internal drainage is slow.

*Present use and management.*—Most of the uneroded areas of this complex are in forest of cutover oaks, hickory,

dogwood, beech, and other hardwoods. Frequent burning and removal of salable timber have reduced the quality of the stand. Many of the larger trees are culls. Trees grow at a fairly rapid rate on these soils.

Practically all of the eroded areas of these soils have been used for row crops, hay, and pasture. Much of these areas is now idle or in wild pasture. Lespedeza grown for hay and pasture is the principal crop, and a few areas are used for cotton, corn, and other crops. Yields are low. Alfalfa and kudzu generally do not grow well because of lack of moisture during the dry summer months. Fertilizer is not commonly used. Ordinarily, crops are not rotated systematically.

*Management requirements.*—This mapping unit is so droughty, severely eroded, and subject to further erosion that it is best used for permanent pasture or other permanent vegetation. Row crops can be grown on the uneroded areas, but not more than once in 6 years. Tillage should be on the contour but, ordinarily, except to prepare a seedbed, the soils should not be tilled. Soil tests will indicate the need for lime and fertilizer. Avoid overgrazing in the dry summer months.

The mapping unit is suited to such hay and pasture plants as fescue, ryegrass, bermudagrass, whiteclover, sericea lespedeza, and annual lespedeza. If not needed for hay or pasture, it should be planted to pines. Trees must be protected from fire and cull trees replaced. This mapping unit is in capability unit VIe-1.

**Freeland fine sandy loam, eroded gently sloping phase (Fa and Fc).**—This moderately well drained pan soil occupies slopes of 2 to 5 percent. It occurs on terraces scattered throughout the county. It has developed in old mixed alluvium washed from loess and sandy Coastal Plain materials. Associated with this soil are other terrace soils of the Dexter, Freeland, Hatchie, and Almo series; and the Hymon, Ina, and Beechy bottom soils. The native vegetation was deciduous forest.

*Profile description:*

- 0 to 6 inches, brown loose fine sandy loam; very weak granular structure.
- 6 to 24 inches, yellowish-brown fine sandy clay loam; weak medium subangular blocky structure.
- 24 to 42 inches, (siltpan) mottled yellowish-brown, dark-brown, and light-gray silty clay loam.
- 42 inches+, brown friable fine sandy loam with light-gray splotches.

The amount of sand throughout the profile varies considerably from place to place. In some areas the pan layer consists of fine sandy clay loam.

This soil is acid. It is moderately low in organic matter, in plant nutrients, and in water-supplying capacity. It dries out more quickly than the Freeland silt loams and is more droughty. The soil is permeable, but the pan is only slightly permeable. Runoff is medium, and internal drainage is slow.

Included in this mapping unit are some areas of moderately eroded terrace soil. Also included, on slopes of 2 to 5 percent, are some areas of moderately well drained soil derived from sandy old mixed colluvium. These are slightly to moderately eroded.

*Present use and management.*—Most of this soil is used for crops, principally cotton, corn, lespedeza, soybeans, and sorghum. In some years, corn is damaged by drought. Ordinarily crops are not rotated systematically. Except for cotton, where complete fertilizer is used, fertilizer is not commonly applied.

*Management requirements.*—This soil is suited to most of the crops common to the area except the deep-rooted crops and those requiring large amounts of moisture. Row crops can be grown as much as half of the time but not more than 2 consecutive years. A cover crop should follow the row crop to help prevent erosion and maintain the content of organic matter. The need for lime and fertilizer can be determined by soil tests. Cultivating should be done on the contour and waterways left in sod. Terraces may be needed to help prevent erosion. Grazing must be limited in the pastures during the summer so that roots will grow sufficiently to withstand drought.

This soil is suited to small grains, vetch, crimson clover, and such drought-resistant crops as cotton, soybeans, and sorghum. It is also suited to many grasses and legumes grown for hay and pasture, such as fescue, whiteclover, bermudagrass, orchardgrass, sericea lespedeza, and annual lespedeza. It is in capability unit IIc-2.

**Freeland fine sandy clay loam, severely eroded sloping phase (Fb and Fd).**—This moderately well drained pan soil of the terraces occurs in all parts of the county. It is on slopes of 5 to 8 percent. It has developed in old mixed alluvium washed from loess and sandy Coastal Plain materials. Associated with this soil are Dexter, Hatchie, Almo, and other Freeland soils of the terraces, and Hyman, Ina, and Beechy soils of the bottom lands. The native vegetation was hardwood forest.

Some areas of this soil are only slightly to moderately eroded. In most places at least 75 percent of the original surface soil has been lost through erosion. In many places part of the subsoil is eroded. The present plow layer consists of remnants of the original surface soil mixed with the subsoil. Its texture is dominantly fine sandy clay loam, but in a few less eroded spots the texture is fine sandy loam.

This soil is acid. It is low to very low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Severe erosion has caused the soil to be droughty. Runoff is medium to rapid, and internal drainage is slow.

Included in this mapping unit are areas of old mixed colluvium that have characteristics similar to this soil. All Freeland soils of sandy texture that occur on slopes greater than 8 percent are included in this mapping unit.

*Present use and management.*—Most of this soil has been used for row crops, but some is now idle or in wild pasture. The principal crops are cotton, corn, and lespedeza. Soybeans and sorghum are also grown. Yields of all crops are generally low. Except under cotton, where complete fertilizer is used, fertilizer is not commonly applied.

*Management requirements.*—This soil is so droughty and, in most places, so severely eroded that it is best suited to hay and pasture. If necessary it can be used for row crops about once every 6 years without risk of further severe erosion, provided all cultivating is done on the contour and waterways are left in sod. Terracing, stripcropping, or both, are also needed to help prevent erosion. Need for fertilizer for pastures and row crops can best be determined by soil tests. In pastures, weeds must be clipped and grazing limited.

This soil is suited to fescue, orchardgrass, bermudagrass, white clover, crimson clover, small grains, vetch, cotton, soybeans, sorghum, sericea lespedeza, and other

lespedezas. The soil is ordinarily too droughty for good stands of alfalfa, kudzu, and corn. It is in capability unit IVe-1.

**Freeland silt loam, eroded gently sloping phase (Fe).**—This moderately well drained pan soil occurs on second bottoms throughout the county. It occupies slopes of 2 to 5 percent. Part of it has developed in old mixed alluvium washed from loess and sandy Coastal Plain materials, and part in shallow loess over old alluvium that washed from Coastal Plain materials. This soil differs from Freeland fine sandy loam, eroded gently sloping phase, mainly in having a finer textured surface soil and in being generally finer textured throughout. Associated with it are Dexter, Hatchie, Almo, and other Freeland soils and adjacent soils of the bottom lands. It was formed under deciduous forest.

Profile description:

- 0 to 6 inches, brown very friable silt loam; weak fine crumb structure.
- 6 to 24 inches, yellowish-brown friable silt loam; weak medium subangular blocky structure.
- 24 to 42 inches, (siltpan) mottled yellowish-brown, dark-brown, and light-gray firm silty clay loam; coarse angular blocky structure.
- 42 inches+, brown friable loam with a few light-gray mottles.

The amount of sand throughout the subsoil and substratum varies considerably from place to place in this soil. Erosion losses range from slight to moderate.

This soil is acid. It is moderately low in organic matter, in plant nutrients, and in water-holding capacity. The surface soil and subsoil are readily permeable, but the pan is only slightly permeable. Runoff is medium, and internal drainage is slow.

A few areas of moderately well drained soils that show less profile development than the typical soil are included in this mapping unit. These areas occur on low terraces.

*Present use and management.*—Practically all of this soil is used for row crops and pasture. The principal crops are cotton, corn, soybeans, sorghum, and lespedeza. Yields are moderate. In dry seasons drought damages the corn. Except under cotton, where complete fertilizer is ordinarily applied, fertilizers are not generally used.

*Management requirements.*—This soil is suited to row crops, which are best grown in short rotations. Row crops can be grown as much as half the time but for not more than 2 consecutive years. The content of organic matter needs to be kept high. This can be accomplished partly by growing cover crops following row crops. Cultivating should be done on the contour and waterways left in sod. Some areas may need terraces to help prevent erosion.

This soil is suited to small grains, vetch, white clover, crimson clover, fescue, orchardgrass, bermudagrass, lespedeza, and such drought-resistant crops as cotton, soybeans, and sorghum. It is in capability unit IIe-2.

**Freeland silt loam, severely eroded gently sloping phase (Ff).**—This yellowish-brown, moderately well drained, pan soil is on second bottoms scattered throughout the county. It occurs on slopes of 2 to 5 percent. A few areas are on low terraces. This soil has developed from old mixed alluvium washed from loess and sandy Coastal Plain materials. In many places it appears to have developed in a thin layer of loess that overlies old sandy alluvium. Associated with it are Dexter, Hatchie, Almo, Hyman, Ina, Beechy, and other Freeland soils.

Erosion has removed 75 percent of the original surface soil and, in places, part of the subsoil. The amount of sand in the profile varies from place to place.

This soil is acid. It is moderately low in organic matter, in plant nutrients, and in water-holding capacity. It is somewhat droughty. The surface soil and subsoil are readily permeable, but the pan is only slightly permeable. Runoff is medium, and internal drainage is slow.

Some areas of old colluvial soils that were formed in mixed materials are included in this mapping unit. The included soil is moderately well drained and severely eroded.

*Present use and management.*—All of this soil has been cropped. About 40 percent is now used for cotton, 30 percent for corn, 20 percent for crops such as lespedeza and soybeans, and about 10 percent is idle or in unimproved pasture. Yields are low. Drought usually damages the corn. Crops are not commonly rotated systematically. Generally, cotton is fertilized and other crops are not.

*Management requirements.*—This soil is so severely eroded and droughty that it is suited to row crops grown only in a moderately long rotation. Row crops are best followed by a winter cover crop and then by at least 2 years of grasses and legumes. The cover crop turned under will increase the content of organic matter. The need for lime and fertilizer can best be determined by soil tests. Cultivating should be on the contour and waterways left in sod. If the soil is cultivated, terracing, stripcropping, or both, are generally needed to help prevent erosion. If it is pastured, overgrazing must be avoided.

The soil is suited to cotton, soybeans, sorghum, small grains, white clover, crimson clover, vetch, fescue, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. It is in capability unit IIIe-1.

**Freeland silt loam, eroded sloping phase (Fg).**—This moderately well drained pan soil occurs on slopes of 5 to 8 percent on old terraces. It has developed in old mixed alluvium washed from loess and sandy Coastal Plain materials. In many places the soil appears to have developed in a thin layer of stabilized loess that overlies old sandy alluvium. The soil is in the same general area as other terrace soils of the Dexter, Freeland, Hatchie, and Almo series and as the Hymon, Ina, and Beechy bottom soils. Deciduous forest, consisting chiefly of oaks, was the dominant native vegetation.

**Profile description:**

- 0 to 6 inches, brown very friable silt loam; weak fine crumb structure.
- 6 to 24 inches, yellowish-brown friable heavy silt loam; weak medium subangular blocky structure.
- 24 to 40 inches, (siltpan) mottled yellowish-brown, dark-brown, and light-gray firm silty clay loam; coarse angular blocky structure.
- 40 inches+, brown to dark-brown loam; has a few light-gray mottles.

The amount of sand varies throughout the profile. Erosion losses range from none to 75 percent of the original surface soil, but in no area have these losses been great enough to alter significantly the use and management of the soil.

This soil is acid. It is moderately low in organic matter and plant nutrients and has a low water-supplying capacity. The surface soil and subsoil are permeable, but the pan is only slightly permeable. The soil is somewhat droughty. Runoff is medium, and internal drainage is

slow. Some areas of slightly to moderately eroded old colluvial soils are included in this mapping unit.

*Present use and management.*—Practically all of this soil is used for crops, principally cotton, corn, and lespedeza. Even in normal seasons corn is usually damaged by drought. Fertilizers are not generally used, except under cotton, where complete fertilizer is commonly applied. As a rule crops are not rotated systematically.

*Management requirements.*—This soil is suited to most of the crops common to the area such as cotton, soybeans, sorghum, and cowpeas. It is highly erodible and somewhat droughty, however, and row crops will need to be grown in a 3-year rotation with grasses and legumes. If a cover crop follows the row crop, it will help prevent erosion and increase the content of organic matter in the soil. The need for lime and fertilizer can best be determined by soil tests. Cultivating should be done on the contour and waterways left in sod. It is generally necessary to use terraces, to stripcrop, or both.

This soil is well suited to such hay and pasture crops as small grains, vetch, fescue, crimson clover, white clover, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. Grazing should be limited during dry seasons. The pasture will need frequent applications of fertilizer. This soil is in capability unit IIIe-1.

**Freeland silt loam, severely eroded sloping phase (Fh).**—This is a yellowish-brown, moderately well drained soil of the terraces or second bottoms. It has developed in old mixed alluvium washed from loess and sandy Coastal Plain materials. In many areas it appears to have developed in a thin layer of stabilized loess that overlies old sandy alluvium. The soil occurs on slopes of 5 to 8 percent. It is scattered throughout the county in the same general areas as Dexter, Hatchie, Almo, Hymon, Ina, Beechy, and other Freeland soils. The native vegetation was deciduous forest.

This soil differs from Freeland silt loam, eroded sloping phase, mainly in having lost at least 75 percent of the original surface soil through erosion. In many places part of the subsoil has been eroded. The amount of sand throughout the profile varies from place to place.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-supplying capacity. It is droughty. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Runoff is medium to rapid, and internal drainage is slow.

Included in this mapping unit are areas of soil derived from old mixed colluvium that was washed from loessal and Coastal Plain materials.

*Present use and management.*—All of this soil has been used intensively for row crops. About 20 percent is in cotton and corn, about 40 percent is in lespedeza, and about 40 percent is idle or in unimproved pasture. Generally crops are not rotated systematically, and little fertilizer is used. Yields are low. Even in normal seasons, the corn is usually damaged by drought.

*Management requirements.*—These soils are so severely eroded and droughty that they are best used for hay and pasture. If necessary, they can be row cropped occasionally but not more than once in about every 6 years. Cultivating should be done on the contour and waterways left in sod. If the soil is cultivated, terracing, stripcropping, or both may be needed to help prevent erosion. Need for lime and fertilizer can be determined by soil tests.

This soil is suited to cotton, soybeans, cowpeas, and sorghum. Other crops to which it is suited include fescue, small grains, whiteclover, bermudagrass, sericea lespedeza, and other lespedezas. If the soil is pastured, overgrazing must be avoided. This soil is in capability unit IVE-1.

**Freeland silt loam, severely eroded strongly sloping phase (Fk).**—This yellowish-brown, moderately well drained pan soil occurs throughout the county on old terraces that have slopes of 8 to 12 percent. It differs from Freeland silt loam, severely eroded sloping phase, in generally having a thinner and less well developed pan. The soil was formed in old mixed alluvium washed from loess and sandy Coastal Plain materials. Some of it appears to have formed in a thin layer of loess that overlies old stream alluvium. It is associated with Dexter, Hatchie, Almo, and other Freeland soils, and with Hymon, Ina, and Beechy soils of the bottoms.

Profile description:

- 0 to 6 inches, brown to yellowish-brown, friable silt loam.
- 6 to 22 inches, yellowish-brown friable heavy silt loam; weak medium subangular blocky structure.
- 22 to 38 inches, (siltpan) mottled brown, yellowish-brown, and light-gray firm silty clay loam; coarse angular blocky structure.
- 38 inches+, brown friable loam with a few light-gray splotches.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Runoff is medium to rapid, and internal drainage is slow.

A few small areas of this soil are only slightly or moderately eroded. Included in this mapping unit are a few areas of soil derived from old mixed colluvium.

*Present use and management.*—All of this soil has been used for crops, but now about one-half is idle or in unimproved pasture. A few areas are used for cotton and corn, and the rest is used mainly for lespedeza grown for hay. Except under cotton, fertilizers are not generally used, and yields are low. Because of low yields and difficulty in maintaining a stand, alfalfa and kudzu are not ordinarily grown. The present vegetation is not generally sufficient to check active erosion.

*Management requirements.*—This soil is so severely eroded and droughty that permanent pasture or other permanent vegetation is best for most of the areas. A few of the less eroded spots can be used for row crops about 1 year out of every 6 years.

In preparing a seedbed, tilling should be on the contour. Lime and fertilizer needs can be determined by soil tests. Grazing must be limited during the dry summer months to allow plants to grow enough to withstand drought.

This soil is suited to such hay and pasture plants as fescue, whiteclover, bermudagrass, sericea lespedeza, and other lespedezas. If the soil is not needed for pasture, pines or other trees should be planted. This soil is in capability unit VIe-1.

### Gullied land

**Moderately gullied land, Cuthbert-Silerton materials (Ga).**—From 10 to 70 percent of this land type is gullied. The areas between the gullies are occupied mostly by severely eroded Silerton, Cuthbert, Shubuta, Tippah, and Dulac soils. The soil exposed in the gullies is mainly

sandy clay, although in most areas remnants of the original soil profiles remain. Relief ranges from 5 to about 35 percent.

Most of the gullies are shallower and do not cut back so fast as those in Moderately gullied land, Lexington-Ruston materials. The severely eroded soils between the gullies, however, are generally not so well drained and are lower in natural fertility than the similarly located areas of Moderately gullied land, Lexington-Ruston materials.

*Present use and management.*—Most of this land type is abandoned or in wild pasture, but in a few places the pastures have been improved or the areas have been planted to pines. Generally, the gully floors and sides are devoid of plant growth; the areas between the gullies support sedgegrass, briers, and scrub growth. Erosion is generally active, particularly in the gullies, which cut back into the upper slopes and deposit gully wash on adjacent local alluvial and bottom lands.

*Management requirements.*—This land type is best used as woodland. Pines grow well. On areas between the gullies, plants such as bermudagrass or sericea lespedeza can be grown. Heavy applications of lime and fertilizer are needed. Kinds and amounts of amendments are best determined by soil tests. Grazing must be limited during the dry summer months. Areas planted to pines should not be grazed. This land type is in capability unit VIIe-1.

**Moderately gullied land, Lexington-Ruston materials (Gc).**—From 10 to 70 percent of this land type is gullied. The areas between the gullies are occupied mostly by severely eroded Lexington, Ruston, Providence, Dexter, and Freeland soils. The soils exposed in the gullies are chiefly sands or sandy clay loams, although, in most areas, remnants of the original soil profiles remain. Relief ranges from 5 to about 30 percent.

*Present use and management.*—Much of this land type is abandoned or in wild pasture. A few areas have been filled in and seeded to such crops as sericea lespedeza or fescue and whiteclover for pasture. Other areas have been planted to pines. Generally, the gully floors and sides are devoid of vegetation, but the areas between the gullies support sedgegrass, briers, and scrub trees. Erosion is active in the gullies, and areas at the top of the slopes are injured by the backward cutting of gullies. Local alluvial lands and bottom lands are damaged by overwash of sandy materials from these higher areas.

*Management requirements.*—The gully floors and sides should be planted to pine trees and measures taken to prevent fire and damage from grazing. The areas between the gullies can be used for pasture or hay crops, such as orchardgrass, bermudagrass, fescue, whiteclover, sericea lespedeza, and kudzu. Heavy applications of lime and fertilizer are generally needed. Kinds and amounts of lime and fertilizer can be determined by soil tests. Grazing should be limited. If hay or pasture is not needed, pine trees should be planted. This land type is in capability unit VIIe-1.

**Severely gullied land, Cuthbert-Silerton materials (Gb).**—At least 70 percent of this land type is gullied. A close network of gullies has largely destroyed the Silerton, Cuthbert, Dulac, Tippah, and Shubuta soils that originally occupied the area. Although remnants of the original soil profiles remain between the gullies in most places, the exposed soil materials consist chiefly of sandy clay or of thin beds of sand and clay. The gullies are shallower in this land type and cut back more slowly than

in Severely gullied land, Lexington-Ruston soil materials. Also, the soil material is generally less fertile and more droughty. Relief ranges from 5 to about 35 percent, but most areas have slopes of 12 to 30 percent.

*Present use and management.*—A few areas of this land type have been planted to pines, but most are abandoned. The present scrub vegetation between the gullies is generally not sufficient to check erosion, and gully erosion is active. Cutting back at the heads of gullies damages adjacent uplands, and the adjacent bottom lands and local alluvial lands are damaged by the gully wash.

*Use and management requirements.*—This land type is best suited to pine trees. Where pines are planted, measures should be taken to prevent fires and overgrazing.

On some sites plants such as bermudagrass can be grown. The areas can be pastured provided grazing is limited so that the ground is covered at all times. The pastured areas generally need heavy applications of lime and fertilizer. Kinds and amounts of amendments needed should be determined by soil tests. This land type is in capability unit VIIe-1.

**Severely gullied land, Lexington-Ruston materials (Gd).**—More than 70 percent of this land type is gullied. A close network of gullies has largely destroyed the original Lexington, Ruston, Providence, Dexter, or Freeland soils that occupied the areas. Although in most places between the gullies remnants of the original soil profiles remain, the exposed soil materials are chiefly sand or sandy clay loam. Relief ranges from 5 to 35 percent, but most of this land type has slopes of 12 to 25 percent.

*Present use and management.*—Practically all of this land is abandoned or in wild pasture. The rest is planted to pines. Most of the gullied areas in Natchez Trace State Park have been planted to pines, which grow rapidly. On some of the older abandoned areas, the scrub growth has almost stabilized areas between the gullies, but erosion in the gullies is active. Cutting back at the heads of gullies is injuring adjacent upland soils, and the lower bottom and local alluvial soils are being damaged by the sandy gully wash.

*Management requirements.*—This land type is best suited to pine trees. On some areas bermudagrass and kudzu can be grown and pastured provided grazing is limited. In such places heavy applications of lime and fertilizer are needed. Kinds and amounts of amendments should be applied as indicated by soil tests. If pine trees are grown, measures should be taken to prevent fires and overgrazing. This land type is in capability unit VIIe-1.

**Hatchie silt loam, gently sloping phase (Ha).**—This somewhat poorly drained pan soil occupies terraces or second bottoms. It is scattered throughout the county in areas that lie next to stream bottoms. Some areas are on foot slopes. The soil was formed from mixed alluvium or in thin loess that overlies old alluvium. The mixed alluvium was washed from Coastal Plain materials. This soil is associated with Dexter, Freeland, and Almo soils. Profile description:

- 0 to 6 inches, brown friable silt loam; very weak fine crumb structure.
- 6 to 16 inches, yellowish-brown friable silt loam with a few light brownish-gray mottles; weak medium subangular blocky structure.

- 16 to 34 inches, (siltpan) mottled light yellowish-brown, light olive-gray, and white firm silty clay loam; seams contain white silt; weak coarse angular blocky structure.
- 34 inches+, brownish-yellow and light-gray friable loam.

The texture of the surface soil ranges from silt loam to fine sandy loam. In places the subsoil and substratum contain considerable sand. Dark-brown concretions may occur in part or in all of the profile.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the pan is only slightly permeable. Runoff and internal drainage are slow.

*Present use and management.*—Practically all of this soil has been cleared, and about one-half is in row crops. The rest is in hay and pasture. Lespedeza, sorghum, soybeans, cotton, and corn are the principal crops. Yields are low, particularly the yields of corn and cotton. Fertilizers are not generally used.

*Use and management requirements.*—If excess surface water is drained off, this soil is suited to selected row crops. As a rule open ditches, bedding, row arrangement, and diversions will provide adequate surface drainage. Row crops should not be grown oftener than 1 year out of 3 and should be rotated with grasses and legumes. Fertilizer is best applied according to the needs indicated by soil tests.

Crops to which this soil is suited are small grains, soybeans, and sorghum, and such hay and pasture plants as fescue, whiteclover, lespedeza, and bermudagrass. This soil is not well suited to cotton and corn. It is in capability unit IIIw-1.

**Hymon fine sandy loam (Hb).**—This is a nearly level, moderately well drained, bottom soil. It consists of mixed young alluvium washed from soils formed in loess and sandy Coastal Plain materials. This soil is associated with the Beechy, Ina, and other Hymon soils.

Profile description:

- 0 to 6 inches, light grayish-brown very friable fine sandy loam.
- 6 to 20 inches, light-brown very friable loam.
- 20 inches+, mottled brownish-yellow and gray friable silt loam; has thin layers of loose sand.

The amount of sand in the profile is highly variable. The soil is acid throughout and contains a moderate amount of organic matter and plant nutrients. The water-holding capacity is high. The soil is permeable, but during the wet months the water table is high and the subsoil is saturated. Runoff and internal drainage are slow.

*Present use and management.*—Nearly all of this soil is used intensively for row crops, mainly cotton and corn. Some lespedeza is grown for hay. Except under cotton, fertilizer is not commonly used. Because the soil is only moderately well drained and is subject to flooding, alfalfa is not generally grown.

*Management requirements.*—The sandier texture causes this soil to dry out earlier than Hymon silt loam, and it is more droughty during the dry summer months. Susceptibility to flooding somewhat limits its use. If suitable outlets are available, the soil can be drained by using open ditches and diversions and by proper row arrangement. Where the soil is not subject to flooding, row crops can be grown continuously but are best followed by a winter green-manure crop. If flooding kills the winter cover

crop, a summer legume should be turned under. This will help to increase the organic matter in the soil. It is well to apply lime and fertilizer according to needs indicated by soil tests.

This soil is suited to cotton, corn, soybeans, and truck crops. Small grains can be grown in areas not subject to overflow. The soil is also suited to such hay and pasture crops as fescue, Ladino clover, white clover, lespedeza, orchardgrass, and bermudagrass. It is in capability unit IIw-1.

**Hymon fine sandy loam, local alluvium phase (Hc).**—This is a moderately well drained local alluvial or colluvial soil that occurs on gentle foot slopes, small draws, and local alluvial fans at the mouths of small draws. Small areas are scattered throughout the county. The soil consists of mixed materials washed from soils that were formed in loess and sandy Coastal Plain materials. It differs from Hymon fine sandy loam mainly in occurring on smaller, more sloping areas that are not so subject to overflow. It is associated with other local alluvial soils of the Hymon, Ina, and Beechy series and with adjacent upland soils from which its parent materials were washed.

Profile description:

- 0 to 6 inches, light grayish-brown very friable fine sandy loam.
- 6 to 20 inches, light-brown very friable loam.
- 20 inches+, mottled brownish-yellow and gray friable silt loam that has thin layers of loose sand.

The amount of sand throughout the soil varies considerably. In some areas fresh sand, recently washed from adjacent gullies, covers the surface.

This soil is acid throughout. It has a moderate amount of organic matter and plant nutrients and a moderate water-holding capacity. During winter and spring, the water table is intermittently high. In summer the soil tends to be droughty, particularly where the content of sand is high. Runoff and internal drainage are slow.

*Present use and management.*—Nearly all of this soil is row cropped intensively. Cotton and corn are the principal crops, but about 15 percent of the soil is used for lespedeza hay. Yields are moderate but are generally slightly lower than for Hymon silt loam, local alluvium phase. Except under cotton, fertilizer is not commonly used.

*Management requirements.*—If properly drained and managed, this soil is suited to intensive row cropping. Where outlets are available, it can be drained by open and diversion ditches, bedding, and row arrangement. Some areas may need to have ditches placed on nearby slopes to prevent runoff from damaging the soil. Row crops should be followed by a winter cover crop. Need for lime and fertilizer is best determined by soil tests.

This soil is suited to cotton, corn, small grains, soybeans, and truck crops. It is also suited to such hay and pasture plants as fescue, whiteclover, lespedeza, orchardgrass, and bermudagrass. This soil is in capability unit IIw-1.

**Hymon silt loam (Hd).**—This nearly level, moderately well drained soil occurs along stream bottoms. It consists of young mixed alluvium washed from soils that have formed in loess and sandy Coastal Plain materials. It is not so sandy as Hymon fine sandy loam. Associated with it are Ina, Beechy, and other Hymon soils. It is an important agricultural soil.

Profile description:

- 0 to 20 inches, brown very friable silt loam; weak granular structure.
- 20 inches+, mottled gray, olive, and brown friable silt loam; has some thin layers of loose sand.

The number and thickness of the thin layers of fine sand in the subsurface soil vary considerably from place to place. In places the soil appears to consist of about 14 to 24 inches of very recent material that overlies an old poorly drained buried soil.

This soil is acid. It has a moderately high amount of organic matter and plant nutrients and a high water-supplying capacity. Runoff and internal drainage are slow. During the winter months, the water table is near the surface and many areas are subject to frequent overflow.

*Present use and management.*—Practically all of this soil is used for crops, principally cotton, corn, and lespedeza. Intensive row cropping without properly fertilizing is the general practice, and yields are only moderately high. Because of the risk of damage from flooding, small grains and alfalfa are not generally grown.

*Management requirements.*—If properly drained and managed, this soil is suited to intensive row cropping. Where suitable outlets are available, it can be adequately drained by using open or diversion ditches, bedding, row arrangement, and tile. Where the soil is not subject to damaging overflow, row crops should be followed by a green-manure crop. If flooding kills the winter cover crop, a summer legume can be grown and turned under. Needs for lime and fertilizer are best determined by soil tests.

This soil is suited to most of the crops commonly grown in the county, such as cotton, corn, soybeans, and truck crops. Hay and pasture plants to which the soil is suited include fescue, whiteclover, lespedeza, orchardgrass, and bermudagrass. This soil is in capability unit IIw-1.

**Hymon silt loam, local alluvium phase (He).**—This gently sloping, moderately well drained soil occupies small areas throughout the county. It occurs on foot slopes and in small draws. The soil consists of mixed materials washed from loess and sandy Coastal Plain materials. It occurs in smaller, more sloping areas than Hymon silt loam and is not so subject to overflow. This soil is associated with other local alluvial soils of the Hymon, Ina, and Beechy series and with adjacent upland soils from which its parent materials were washed. It is an important agricultural soil.

Profile description:

- 0 to 6 inches, grayish-brown friable silt loam; very weak granular structure.
- 6 to 16 inches, light-brown friable silt loam; weak granular structure.
- 16 inches+, brown friable silt loam, mottled with light gray.

Some thin layers of sand are in the subsurface layers and substratum. These vary widely from place to place in number and thickness. This soil is young, and its profile development is slight.

This soil is acid. The amount of organic matter and plant nutrients is moderate, and the water-supplying capacity is high. Runoff is medium to slow, and internal drainage is slow. The water table is high during winter and spring.

*Present use and management.*—Practically all of this soil is row cropped intensively. Cotton and corn are the principal crops. The yields are moderately high. Except where cotton is grown, fertilizer is not commonly used. Because the soil has slow internal drainage and a high water table during winter, alfalfa is not generally grown.

*Management requirements.*—This soil is suited to intensive row cropping, but sustained high yields can best be obtained by using a short rotation that includes grasses and legumes. Row crops should not be grown more than one-half of the time. Crops on this soil respond well to fertilizer. Fertilizer and lime are best applied according to the needs indicated by soil tests. In some places ditches may be needed to divert the runoff from adjacent slopes.

This soil is suited to cotton, corn, soybeans, small grains, vetch, whiteclover, fescue, orchardgrass, bermudagrass, and lespedeza. It is in capability unit IIw-1.

**Ina fine sandy loam (1a).**—This is a nearly level, somewhat poorly drained bottom soil. It was derived from mixed alluvium washed from soils formed in loess and sandy Coastal Plain materials. It occurs along stream bottoms throughout the county and is associated with other bottom soils of the Hymon, Ina, and Beechy series. The soil is important to the agriculture of the county.

*Profile description:*

0 to 6 inches, light grayish-brown loose, fine sandy loam.

6 to 12 inches, light-brown very friable loam.

12 inches+, mottled light-gray and brownish-yellow friable very fine sandy loam; alternating layers of silt and sand are common.

The amounts of sand and silt in the profile are highly variable. This soil is acid. It is moderate in organic matter, in plant nutrients, and in water-supplying capacity. The water table is high during winter and spring, and frequent flooding is common. Generally, this sandier soil dries out earlier in spring than Ina silt loam and tends to be more droughty during the dry summer months. Runoff and internal drainage are slow.

Included in this mapping unit are a few areas of Ina fine sandy loam and Ina silt loam that are covered with recently deposited raw sand that is up to 12 inches deep. This sand overwash is generally less productive than the material beneath it. Also included are a few areas that are rarely flooded. These occur along the larger stream bottoms and occupy higher positions than the surrounding bottom soils.

*Present use and management.*—About 75 percent of this soil is cropped. The rest is in forests of cutover hardwoods. The principal crops are cotton, corn, lespedeza, soybeans, and sorghum. Yields are only moderate, and occasionally floods drown out a crop. Fresh deposits of sand on many areas make the soil less productive.

*Management requirements.*—Where floods are controlled and internal drainage is adequate, row crops can be grown intensively. In some places levees and diversion ditches would prevent flooding and would keep sand from being washed onto the soil. Open ditches, bedding, proper row arrangement, and diversion ditches will improve internal drainage if outlets are available. If flooding is not a hazard, a winter cover crop should follow row crops. It is best to use soil tests to determine the need for lime and fertilizer.

Under proper management, this soil is well suited to corn, cotton, soybeans, and sorghum. It is also suited to

such hay and pasture plants as fescue, white clover, alsike clover, lespedeza, and bermudagrass. It is in capability unit IIIw-2.

**Ina fine sandy loam, local alluvium phase (1b).**—This gently sloping, somewhat poorly drained, local alluvial soil is scattered throughout the county. It consists of mixed material washed from soils formed in loess and sandy Coastal Plain materials. This soil differs from Ina fine sandy loam mainly in having stronger slopes and in being less subject to overflow. It is associated with other local alluvial soils of the Hymon, Ina, and Beechy series and with soils on adjacent slopes from which its parent materials were washed. The profile is essentially the same as that of Ina fine sandy loam. The amount of sand in the profile varies greatly from place to place, however, and in many places, the soil is stratified.

This soil is acid. It is moderate in content of organic matter and plant nutrients and has a moderately high water-holding capacity. The sandier areas dry out early in spring and tend to be droughty during the dry summer months. The water table is high during winter and early spring, and the soil is sometimes wet at planting time. Runoff and internal drainage are slow.

*Present use and management.*—About two-thirds of this soil is in crops or pasture. The rest is in forests of cutover hardwoods. Intensive row cropping of corn and cotton is the general practice, although some lespedeza, soybeans, and sorghum are grown. Fertilizer is not commonly used, and yields are only moderate. Planting is usually delayed by excess water where the soil is not artificially drained.

*Management requirements.*—If properly drained and managed, this soil can be intensively row cropped. Where suitable outlets are available, it can be drained by open ditches, tile, bedding, and diversions. Runoff from nearby slopes can be intercepted by diversion ditches. If moisture conditions are favorable, it is best to plant a winter cover crop following a row crop. Soil tests will indicate the kinds and amounts of lime and fertilizer needed.

This soil is suited to cotton, corn, soybeans, and sorghum. It is also suited to hay and pasture plants such as fescue, white clover, alsike clover, lespedeza, and bermudagrass. It is in capability unit IIIw-2.

**Ina loamy fine sand, local alluvium phase (1c).**—This soil consists of Ina fine sandy loam or Ina silt loam, local alluvium phase, on which loamy fine sand up to 12 inches deep was recently deposited. It is scattered throughout the county in draws, on foot slopes, or on local alluvial fans.

*Profile description:*

0 to 10 inches, yellowish-brown loose loamy fine sand.

10 to 22 inches, light-brown very friable loam.

22 inches+, mottled light-gray and brownish-yellow friable very fine sandy loam.

This soil is acid throughout. The topmost layer is low in organic matter and plant nutrients, but the material beneath contains a moderately large amount. During wet seasons the water table is intermittently high. The sandy surface layer dries out quickly and is droughty during the dry summer months. Runoff and internal drainage are slow.

Included in this mapping unit are some areas on which sand has recently been deposited over a moderately well

drained rather than over a somewhat poorly drained bottom soil.

*Present use and management.*—Most of this soil is used for row crops, hay, and pasture. Cotton, corn, lespedeza, and soybeans are the principal crops. Fertilizer is not commonly used, and yields are low. Measures to prevent additional sand from being deposited are generally not adequate, and in many places the soil is becoming less productive.

*Management requirements.*—This soil would be suited to intensive row cropping if the damaging runoff from adjacent slopes were controlled. The runoff can best be controlled by stabilizing erosion on the higher lying slopes and by using diversion ditches until this is done. Heavy applications of lime and fertilizer are generally needed, but the kinds and amounts are best determined by soil tests.

If erosion is controlled on the adjacent slopes, this soil is suited to corn, cotton, soybeans, sorghum, and other crops. A green-manure crop should follow a row crop. This soil is in capability unit IIIw-2.

**Ina silt loam (1d).**—This nearly level, somewhat poorly drained soil occupies large areas along stream bottoms throughout the county. It consists of mixed alluvium washed from soils formed in loess and sandy Coastal Plain materials. This soil is associated with Hymon, Beechy, and other Ina soils. It is an important agricultural soil.

Profile description:

- 0 to 12 inches, brown to dark-brown very friable silt loam; very weak fine granular structure.
- 12 inches+, mottled light-gray and yellowish-brown very friable loam; very weak fine granular structure.

The amount of sand in the profile below the surface layer varies greatly from place to place, and layers of silt and sand are common. Except in a few areas, where recent alluvium 9 to 14 inches deep overlies a poorly drained old soil, the profile has not had time to develop layers that are distinctly different in texture. A few areas along the larger streams lie a little higher than the surrounding bottom soils and are seldom flooded.

This soil is acid throughout. It has a moderate amount of organic matter and plant nutrients and a high water-supplying capacity. The water table is high during winter and spring. If the soil is not drained artificially, it often stays wet too late for planting row crops. Runoff is slow to very slow, and internal drainage is slow.

*Percent use and management.*—About 75 percent of this soil is cropped. Cotton and corn are grown intensively on about 70 percent of the cleared areas, and lespedeza is grown for hay on about 20 percent. Sorghum, soybeans, and pasture take up the remaining 10 percent. Floods often drown out row crops, but soybeans are commonly used to replace the row crop in areas where the crop has drowned out. Yields are moderate. Except under cotton, fertilizers are not generally used.

*Management requirements.*—If this soil is properly drained and protected from floods, it can be cropped continuously. The use of open ditches, tile, bedding, and diversion terraces will improve drainage, and levees will protect some areas from flooding. Soil tests will indicate the kinds and amounts of fertilizer needed.

If the soil is drained and protected from floods, it is suited to cotton, corn, soybeans, and sorghum, and to

Ladino clover, alsike clover, lespedeza, and bermudagrass. It is in capability unit IIIw-2.

**Ina silt loam, local alluvium phase (1e).**—This gently sloping, somewhat poorly drained soil occurs on foot slopes, in small draws, and on local alluvial fans at the mouths of draws. It is scattered throughout the county. The soil has developed in mixed material washed from soils formed in loess and sandy Coastal Plain materials. This soil is more sloping than Ina silt loam and is not so subject to flooding. It is associated with other local alluvial soils of the Hymon, Ina, and Beechy series and the upland soils from which its parent materials were washed.

Profile description:

- 0 to 14 inches, pale-brown very friable silt loam; very weak fine granular structure.
- 14 inches+, mottled light-gray and yellowish-brown very friable silt loam; very weak fine granular structure.

The texture in the profile below the surface soil ranges from silt loam to loamy fine sand. Layers of sand and silt are common. In many places the profile has not had time to develop layers that have distinctly different texture. Some areas, however, have about 12 inches of recent overwash over what appears to be a poorly drained old buried soil.

This soil is acid throughout. It is moderate in organic matter and plant nutrients and has a high water-supplying capacity. The water table is high during winter and early spring, and the soil is often saturated at planting time. Runoff and internal drainage are slow.

*Present use and management.*—About three-fourths of this soil is used for row crops, hay, and pasture, but yields are only moderate. Cotton, corn, soybeans, and sorghum are the principal row crops. Lespedeza is grown extensively for hay and pasture, and stands of fescue and Ladino clover have been established in a few improved pastures. Floods drown out row crops fairly often. Fertilizer is not commonly used.

*Management requirements.*—If drained and properly managed, this soil is suited to intensive cropping. It is best to have a green-manure crop follow the row crop where water conditions permit. The use of open ditches, diversions, bedding, tile, or row arrangement will drain the soil adequately. Soil tests will indicate the kinds and amounts of lime and fertilizer needed.

This soil is suited to corn, cotton, soybeans, and sorghum. It is also suited to such pasture plants as fescue, white clover, alsike clover, lespedeza, and bermudagrass. It is in capability unit IIIw-2.

**Lexington silt loam, eroded gently sloping phase (La).**—This brown, well-drained soil of the uplands has developed in a thin layer (24 to 45 inches) of loess that overlies acid sandy Coastal Plain materials. It occurs on broad ridgetops and on ridge slopes of 2 to 5 percent. It is associated with Providence, Ruston, and other Lexington soils.

Profile description:

- 0 to 6 inches, brown to dark-brown friable silt loam; weak fine crumb structure.
- 6 to 34 inches, reddish-brown to brown friable silty clay loam; moderate medium blocky structure.
- 34 inches+, reddish-yellow loose sand.

In a few areas the surface texture is loam, particularly in areas where the silty material is less than 24 inches thick. Here, an appreciable amount of sand occurs

throughout the profile. Erosion has been moderate, and some areas are virtually uneroded.

This soil is medium acid. It is moderate in organic matter, in plant nutrients, and in water-holding capacity. It is permeable. Runoff and internal drainage are medium.

*Present use and management.*—All of this soil is used for row crops or pasture. Cotton, corn, lespedeza, and small grains are the principal crops, and yields are moderate. Fertilizer is applied lightly under most row crops, particularly cotton. Generally, crops are not rotated systematically; the farmer usually selects his crops according to his needs. Intensive row cropping without using adequate amendments and erosion control practices has caused erosion and low fertility.

*Management requirements.*—This soil is suited to all the crops commonly grown in the county. A moderately high level of fertility can be reached and maintained by using good management. Lime and fertilizer are needed, but the kinds and amounts are best determined by soil tests. Row crops should be grown not more than 2 consecutive years in rotation with grasses and legumes. During the winter the soil will need to be protected by a cover crop or green-manure crop. Practices needed in some areas to control erosion include tilling on the contour, stripcropping, terracing, and sodding waterways. This soil is in capability unit IIe-1.

**Lexington silt loam, sloping phase (Lb).**—This is a well-drained soil of the uplands. It occurs on narrow ridgetops that have slopes of 5 to 8 percent. The soil has developed in a thin layer (24 to 42 inches) of silt that overlies acid sandy Coastal Plain materials. This soil is associated with Providence, Ruston, and other Lexington soils. The native vegetation was deciduous forest, chiefly of oak.

Profile description:

- 0 to 8 inches, yellowish-brown friable silt loam; weak fine crumb structure.
- 8 to 37 inches, strong-brown to brown friable silty clay loam; weak medium blocky structure.
- 37 inches+, reddish-yellow loose sand.

The layer of silty material is generally thinner than on the milder slopes. Although the texture of the surface soil is typically silt loam, a few areas have a loam surface soil.

The upper part of the profile is medium to strongly acid. The soil is moderately low in organic matter. It is moderate in supply of plant nutrients and in water-holding capacity and is permeable throughout. Runoff and internal drainage are medium.

*Present use and management.*—Practically all of this soil is in cutover forest. Fires have made most of the trees worthless. The soil lies on narrow ridgetops and is isolated by soils not suited to row crops.

*Management requirements.*—Although this soil is suitable for all of the crops commonly grown in the county, the areas are so small and inaccessible that they are not desirable for cropping. If the soil is cleared, a rotation of 1 year of row crops to at least 2 years of close-growing crops can be used. Ordinarily, tilling on the contour, stripcropping, terracing, and using sodded waterways are practices needed. The soil needs lime and fertilizer. The kinds and amounts can be determined by soil tests. The forests on this soil need selective cutting and protection from fire. This soil is in capability unit IIIe-2.

**Lexington silt loam, eroded sloping phase (Lc).**—This well-drained soil of the uplands generally occupies broad sloping ridgetops. It occurs on slopes of 5 to 8 percent. The soil has developed in a thin layer (24 to 42 inches) of loess that overlies acid sandy Coastal Plain materials. It is associated with Providence, Ruston, and other Lexington soils. It has formed under forest.

Profile description:

- 0 to 6 inches, yellowish-brown friable silt loam; weak fine crumb structure.
- 6 to 35 inches, strong-brown to reddish-brown friable silty clay loam; weak to moderate medium blocky structure.
- 35 inches+, reddish-yellow loose sand.

From 25 to 75 percent of the surface soil has been lost through erosion and, in spots, reddish-brown subsoil is exposed. Although the texture of the surface layer is typically silt loam, in a few small areas the texture is loam. Generally, these areas have a thin profile and are sandy throughout.

This soil is medium acid. It is moderate to low in organic matter and moderate in plant nutrients and in water-holding capacity. Runoff and internal drainage are medium.

*Present use and management.*—Practically all of this soil is in crops or pasture. The principal crops are cotton (fig. 7), corn, lespedeza, small grains, and soybeans, but



Figure 7.—Handpicking cotton on Lexington silt loam, eroded sloping phase. This is one of the best soils of the uplands for this crop.

yields are low. Pasture plants are mainly orchardgrass, fescue, and clover. Light applications of fertilizer are used under most crops, particularly under cotton.

*Management requirements.*—This soil is well suited to all the crops commonly grown in the county. Erosion is the major hazard (fig. 8) and can be controlled with proper management. A rotation that consists of not more than 1 year of row crops to 2 years of close-growing crops is suitable. In most places tilling on the contour, stripcropping, terracing, and using sodded waterways are practices needed to control erosion. A moderately high level of productivity can be reached and maintained by using these practices combined with the proper use of lime and fertilizer. Soil tests will indicate the kinds and



Figure 8.—Unstabilized roadcut through Lexington silt loam, eroded sloping phase.

amounts of fertilizer needed. This soil is in capability unit IIIe-2.

**Lexington silty clay loam, severely eroded gently sloping phase (Lf).**—This is a brown, well-drained soil of the uplands. It is on broad ridgetops that have slopes of 2 to 5 percent. The soil has developed in a thin layer of loess that overlies acid sandy Coastal Plain materials. It is associated with Providence, Ruston, and other Lexington soils. The native vegetation was deciduous forest, mainly oaks.

**Profile description:**

- 0 to 4 inches, brown friable silt loam to silty clay loam.
- 4 to 32 inches, reddish-brown to brown friable silty clay loam; moderate medium blocky structure.
- 32 inches+, reddish-yellow loose sand.

Severe erosion has caused the loss of most of the original surface soil and, in places, a part of the subsoil. The mixed material in the present plow layer is heavier in texture than that in the original surface layer.

This soil is medium acid. It is low in organic matter and moderate in plant nutrients and in water-holding capacity. Except on the more severely eroded spots, the soil is permeable. Runoff and internal drainage are medium.

**Present use and management.**—Practically all of this soil is in row crops or pasture. The principal row crops are cotton and corn. Other crops are lespedeza, small grains, soybeans, fescue, and clover. The yields are moderate to low. Erosion has decreased the permeability of the soil through loss of the original surface layer. Plant nutrients also have been lost.

**Management requirements.**—Further erosion can be prevented and a moderately high level of fertility can be established and maintained by using good management practices. These include growing not more than 1 year of row crops to 2 years of close-growing crops, liming and fertilizing properly, tilling on the contour, stripcropping, and using terraces and sodded waterways. Soil tests will indicate the kind of fertilizer and the amounts of lime and fertilizer needed. This soil is in capability unit IIIe-2.

**Lexington silty clay loam, severely eroded sloping phase (Lg).**—This brown, well-drained soil of the uplands occurs on broad ridgetops that have slopes of 5 to 8 percent. It has developed in a thin layer of loess that

overlies acid sandy Coastal Plain materials. The soil is associated with Providence, Ruston, and other Lexington soils. It is an important agricultural soil.

**Profile description:**

- 0 to 6 inches, yellowish-brown to brown, friable silty clay loam
- 6 to 33 inches, strong-brown to brown, friable to firm, silty clay loam; moderate medium blocky structure.
- 33 inches+, reddish-yellow loose sand.

Erosion has removed most of the original surface layer. The present plow layer consists of remnants of the original surface layer mixed with the upper part of the subsoil. The texture of the present plow layer, therefore, ranges from silt loam to light silty clay loam. The layer of loess in which the soil developed was generally not so thick as that in which the Lexington soils on milder slopes developed.

This soil is medium acid. It is low in organic matter and moderate in plant nutrients and in water-holding capacity. It is permeable. Runoff is medium to rapid, and internal drainage is medium.

**Present use and management.**—Most of this soil is in row crops, hay, or pasture. A small part is idle or in wild pasture. The principal crops are cotton and corn; annual lespedeza grown for hay; and lespedeza, orchardgrass, fescue, and whiteclover grown for pasture. Continuous row cropping has caused erosion. The surface soil has been lost, and the natural fertility of the soil has become depleted. Consequently, yields are low, and susceptibility to further erosion is high.

**Management requirements.**—If erosion can be controlled this soil is well suited to all of the commonly grown crops. It is best suited to close-growing hay and pasture crops. Row crops can be grown 1 year to 5 or 6 years of grasses and legumes. Terraces may be needed. Tilling should be done on the contour and waterways left in sod. The soil needs lime and fertilizer. The amounts and the kinds of fertilizer are best determined by soil tests.

Some hay and pasture plants to which the soil is suited are fescue; orchardgrass; kudzu; sericea lespedeza; and red, white, and Ladino clovers. Alfalfa will grow well in some areas if limed and fertilized properly. This soil is in capability unit IVe-2.

**Lexington silty clay loam, severely eroded strongly sloping phase (Ld, Le, and Lh).**—This brown, well-drained soil of the uplands occurs on ridgetops and on ridge slopes of 8 to 12 percent. It has developed in a thin layer (20 to 40 inches) of loess that overlies acid sandy Coastal Plain materials. This soil is associated with Ruston and other Lexington soils. It is an important agricultural soil.

**Profile description:**

- 0 to 6 inches, yellowish-brown to brown, friable silt loam to silty clay loam.
- 6 to 31 inches, strong-brown to brown, friable silty clay loam; weak medium blocky structure.
- 31 inches+, reddish-yellow sandy clay loam.

Generally, most of the original surface soil has been lost through erosion. In a few areas, erosion has been much less severe, and the present plow layer consists of remnants of the original surface layer mixed with the upper part of the subsoil. The layer of silt in which this soil has developed is generally thinner than that in which soils on milder slopes originated.

As a rule, this soil is medium acid. In some areas, the upper part of the profile is medium to strongly acid. It is low in organic matter, moderate to low in plant nutrients,

and moderate in water-holding capacity. It is a permeable soil. Runoff ranges from medium on the less eroded spots to rapid on the most eroded areas; internal drainage is medium.

*Present use and management.*—Some of this soil is in row crops and improved pasture, some is in unimproved pasture, or is idle, and some is in forest of cutover and burned-over hardwoods. The principal row crops are cotton and corn. Intensive row cropping has caused severe erosion, which has resulted in lowered productivity. After the soil became less productive, many farmers abandoned it or let it revert to wild pasture. The natural vegetation was not adequate to check erosion, and more of the soil was lost.

*Management requirements.*—This soil is so erodible that it is best kept in permanent pasture or other permanent vegetation. It is well suited to orchardgrass, bermudagrass, fescue, whiteclover, sericea lespedeza, and kudzu. In preparing a seedbed, all tillage should be on the contour. Pastures need such management practices as rotated grazing and weed clipping. They need regular applications of lime and fertilizer in kinds and amounts indicated by soil tests. Where this soil is not needed for pasture, it is best planted to trees. It is in capability unit VIe-2.

**Lexington-Ruston soils, sloping phases (Lk).**—This complex consists of Lexington silt loam so intermingled with Ruston fine sandy loam that it was not feasible to separate the two soils on a map of the scale used. The complex occurs on narrow ridgetops that have slopes of 5 to 8 percent. The Lexington soil has developed in shallow loess, and the Ruston soil in sandy Coastal Plain materials. The soils are near other Lexington and Ruston soils. They were formed under deciduous forest.

Profile description (Lexington silt loam):

- 0 to 6 inches, brown friable silt loam; weak fine crumb structure.
- 6 to 36 inches, strong-brown friable silty clay loam; weak medium blocky structure.
- 36 inches+, dark-brown to yellowish-red, very friable clay loam.

Profile description (Ruston fine sandy loam):

- 0 to 20 inches, light yellowish-brown loose fine sandy loam.
- 20 to 36 inches, brownish-yellow friable sandy clay loam.
- 36 inches+, yellowish-red loamy sand.

In some areas the Ruston soil has a silty surface layer as a result of the loessal influence. The thickness of the loess in which the Lexington soil has formed ranges from 12 to 42 inches, but in most places the loess is about 24 inches thick. The soils of this complex are moderately low in organic matter and plant nutrients and have a moderate to low water-holding capacity. Runoff is medium, and internal drainage is medium to rapid. The soils are permeable.

*Present use and management.*—Practically all of this complex is in forests of cutover hardwoods. Trees grow rapidly, but frequent burning and removal of salable timber have reduced the quality of the stand. Oak, hickory, and dogwood are the dominant species.

*Management requirements.*—Most of this complex is on narrow ridgetops isolated by soils not suited to cultivation. Therefore, the soils are best left in forest. The trees need protection from fire, and cull trees should be removed.

If cleared, these soils are erodible and tend to be

droughty. Row crops will grow on them, but it is best to plant at least 2 years of close-growing crops to each year of row crops. In most places cultivating on the contour, terracing, and using sodded waterways are practices needed. Soil tests will indicate the kinds and amounts of fertilizer to be used.

This complex is suited to cotton, corn, small grains, sorghum, kudzu, fescue, whiteclover, orchardgrass, sericea lespedeza, and other lespedezas. If it is used for pasture, avoid overgrazing. It is in capability unit IIIe-2.

**Lexington-Ruston soils, eroded sloping phases (Lm).**—This complex occurs on ridgetops that have slopes of 5 to 8 percent. The soils in the complex are well drained to somewhat excessively drained. They have formed in shallow loess and sandy Coastal Plain materials. This complex generally occurs in larger areas than Lexington-Ruston soils, sloping phases. The soils are associated with other Lexington and Ruston soils.

The thickness of the loess ranges from 12 to 42 inches, but in most places, the loess is less than 24 inches thick. The texture of the surface layer of the Lexington soil ranges from silt loam to loam. In some areas, the Ruston soil has a silty surface soil. From 25 to 75 percent of the surface layer has been lost through erosion, but in most places the surface texture is not substantially altered.

These soils are acid. They are moderately low in organic matter, in plant nutrients, and in water-supplying capacity. Permeability is rapid, and the Ruston soil is somewhat droughty. Runoff is medium, and internal drainage is medium to rapid.

*Present use and management.*—All of this complex has been cleared, and most is in crops or in lespedeza grown for hay and pasture. The principal row crops are cotton, corn, and cowpeas. Yields of corn are low in dry seasons. Ordinarily, complete fertilizer is used for cotton, but otherwise it is not commonly applied.

*Management requirements.*—This complex is somewhat droughty and erodible. If it is row cropped, a rotation consisting of 1 year of row crops to 2 years of close-growing crops is best. Cultivating on the contour, sodding waterways, and terracing are practices usually needed. Need for fertilizer and lime should be determined by soil tests.

The complex is suited to cotton, soybeans, cowpeas, and corn, but it is better suited to pasture plants, as fescue, whiteclover, kudzu, bermudagrass, orchardgrass, sericea lespedeza, and other lespedezas. If the soils are used for pasture, it is well to clip the weeds, fertilize adequately, and avoid overgrazing. This soil complex is in capability unit IIIe-2.

**Lexington-Ruston soils, severely eroded sloping phases (Ln).**—Well drained to excessively drained Lexington and Ruston soils that occur in an intricate pattern make up this complex. The soils are on ridgetops that have slopes of 5 to 8 percent. They have developed in shallow loess and in sandy Coastal Plain materials. They are associated with other Lexington and Ruston soils. The native vegetation is a deciduous forest.

This complex has lost more than 75 percent of the original surface layer through erosion, and in places part of the subsoil has been lost. The texture of the present plow layer ranges from silt loam to sandy clay loam.

The soils are low to very low in organic matter, in plant nutrients, and in water-holding capacity. They are

permeable and somewhat droughty. Runoff and internal drainage are medium to rapid.

*Present use and management.*—All of this complex has been cropped. At present about one-fourth is in row crops, mainly cotton and cowpeas, and one-fourth in lespedeza hay and pasture. About one-half is idle or in unimproved pasture. Fertilizer is not commonly used, and yields are low.

*Management requirements.*—This complex is droughty and highly erodible, so it is best used for close-growing hay and pasture crops. If row crops are grown, they should not be planted more than once every 5 or 6 years in a rotation. Terraces may be needed. It is best to till on the contour and to leave waterways in sod. Soil tests will indicate the kinds and amounts of lime and fertilizer to be used.

This complex is suited to cotton, cowpeas, and soybeans. Droughtiness limits yields of corn, even in a normal season. Hay and pasture plants to which the soils are suited include fescue, whiteclover, kudzu, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. Alfalfa will grow on selected areas, but it requires strict management. If the complex is used for pastures, fertilize them adequately and avoid overgrazing. This soil complex is in capability unit IVe-2.

**Lexington-Ruston soils, strongly sloping phases (Lo and Lp).**—This complex occurs on slopes of 8 to 12 percent. The Lexington soil has formed in a thin layer of loess that overlies sandy materials. The Ruston has formed in sandy Coastal Plain materials. The soils are well drained to excessively drained. They are associated with other Lexington and Ruston soils.

Profile description (Lexington silt loam):

- 0 to 6 inches, light-brown very friable silt loam; weak fine crumb structure.
- 6 to 26 inches, brown friable silty clay loam; weak medium blocky structure.
- 26 inches+, yellowish-red very friable sandy loam.

The thickness of the silty material in which the Lexington soil has formed ranges from 12 to 42 inches, but in most places it is about 24 inches. The surface texture of the Lexington soil ranges from silt loam to very fine sandy loam.

Profile description (Ruston fine sandy loam):

- 0 to 18 inches, light yellowish-brown loose fine sandy loam.
- 18 to 32 inches, brownish-yellow friable sandy clay loam; weak medium blocky structure.
- 32 inches+, yellowish-red loamy sand.

The soils are low in organic matter, in plant nutrients, and in water-holding capacity. They are permeable, and the Ruston soil is droughty. Runoff and internal drainage are medium to rapid.

*Present use and management.*—Most of this complex is in hardwood forests, consisting chiefly of oak and hickory. Frequent burning and removal of salable timber have reduced the quality of the stand, and most of the larger trees are culls. The trees grow at a rapid rate, and young trees are abundant in most areas. A small part of the complex is idle or in wild pasture. The vegetation is not sufficient to check erosion. Some of this complex is used for cotton, corn, cowpeas, and lespedeza. Yields are low.

*Management requirements.*—Because of droughtiness and high susceptibility to erosion when cleared, this

complex is best left in trees. Measures to prevent fires and to replace cull trees are needed in the management.

If the soils are cleared, they are best seeded to close-growing hay and pasture crops. Row crops can be grown, but not more than once every 5 or 6 years in a rotation with grasses and legumes. Tilling should be done on the contour and waterways left in sod. Soil tests will indicate the kinds and amounts of lime and fertilizer to be used.

The crops to which this complex is best suited are cotton, cowpeas, and soybeans. Pasture and hay plants that grow well on this complex include fescue, whiteclover, bermudagrass, kudzu, sericea lespedeza, and other lespedezas. Avoid overgrazing the pastures. This soil complex is in capability unit IVe-2.

**Lexington-Ruston soils, severely eroded strongly sloping phases (Lr).**—The soils of this complex occur in such an intricate pattern that it was not feasible to separate them on a map of the scale used. The Lexington soil has formed in shallow silty material that is 12 to 42 inches thick but that in most places is about 24 inches thick. The Ruston soil has formed in sandy Coastal Plain materials. These soils are associated with other Lexington and Ruston soils.

More than 75 percent of the original surface layer has been lost through erosion. In many places all of the original surface soil is gone and most of the subsoil. In the Lexington soil, the texture of the present plow layer is silty clay loam. In the Ruston, it is sandy loam. Shallow gullies are common.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The rate of permeability is rapid, and the soils are droughty. Runoff is rapid, and internal drainage is medium to rapid.

*Present use and management.*—All of this complex has been cropped. When the yields became low, most areas were abandoned or used as wild pasture. Vegetation is not generally sufficient to check active erosion.

*Management requirements.*—This complex is droughty, severely eroded, and highly erodible, so it needs to be kept in permanent pasture or other permanent vegetation. The seedbed is best prepared by tilling on the contour. After the sod is established, lime and fertilizer should be applied frequently in kinds and amounts indicated by soil tests. Overgrazing must be avoided.

This complex is suited to such hay and pasture plants as fescue, whiteclover, ryegrass, bermudagrass, sericea lespedeza, and other lespedezas. If not needed for pasture, these soils should be planted to pine trees. This soil complex is in capability unit VIe-2.

**Lexington-Ruston soils, moderately steep phases (Ls).**—This complex occurs mainly on ridge slopes of 12 to 25 percent, but a few areas are on steeper slopes. The Lexington soil has formed in a shallow layer (12 to 42 inches) of loess that in most places is about 24 inches thick. The Ruston soil has formed in acid sandy Coastal Plain materials. The soils are associated with other Lexington and Ruston soils. They have developed under a forest of deciduous hardwoods, chiefly oak, hickory, and poplar.

Profile description (Lexington silt loam):

- 0 to 6 inches, light-brown very friable silt loam.
- 6 to 22 inches, strong-brown friable heavy silt loam; weak medium blocky structure.
- 22 inches+, yellowish-red loose loamy sand.

**Profile description (Ruston fine sandy loam):**

- 0 to 14 inches, light yellowish-brown very friable fine sandy loam.
- 14 to 28 inches, brownish-yellow friable sandy clay loam; weak medium blocky structure.
- 28 inches+, yellowish-red loamy sand.

The Ruston soil on the steeper slopes has a thinner profile than that on milder slopes, and the profile is not so well developed. In some areas of Ruston soil, the texture of the surface layer is silt loam. Generally, on steeper slopes, this silty layer is thinner than on the milder slopes.

The soils of this complex are acid. They are low in organic matter, in plant nutrients, and in water-holding capacity. They are highly permeable and somewhat droughty. Runoff is rapid, and internal drainage is medium to rapid.

*Present use and management.*—Practically all of this complex is under a forest of cutover hardwoods, principally oak, hickory, dogwood, and poplar. Frequent burning and removal of salable timber have reduced the quality of the stand, and many of the mature trees are culls.

*Management requirements.*—The soils of this complex are best left in trees. The trees need protection from fire, and cull trees should be replaced. Where the stand is thin, it is well to plant to pines.

If the soils are needed for pasture, care must be taken in preparing the seedbed so that erosion will not become active. Tillage is best done on the contour and the pasture established on alternating strips. Soil tests will indicate the need for lime and fertilizer.

These soils are suited to such hay and pasture plants as fescue, whiteclover, kudzu, bermudagrass, sericea lespedeza, and other lespedezas. This complex is in capability unit VIe-2.

**Lexington-Ruston soils, severely eroded moderately steep phases (Lt).**—This complex of well drained to excessively drained soils occurs on ridge slopes of 12 to 25 percent. The Lexington soil has formed in silty material that ranges in thickness from 12 to 42 inches but in most places is about 24 inches thick. The Ruston soil has formed in acid Coastal Plain sand. The soils are associated with other Lexington and Ruston soils.

More than 75 percent of the original surface layer has been lost through erosion, and, in places, most of the subsoil has been lost, particularly on the sandier Ruston soil. The texture of the present surface soil is heavier than that of the original surface layer. It is heavy silt loam in the Lexington soil and sandy clay loam in the Ruston. Shallow gullies are common, and a few gullies are deep.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-holding capacity. Runoff is rapid, and internal drainage is medium to rapid.

*Present use and management.*—All of this complex has been cropped, but practically all of the areas are now idle or in unimproved pasture. The plant cover is generally not sufficient to stop erosion.

*Management requirements.*—This complex is so severely eroded and so subject to further erosion that it is best suited to pine trees or other permanent vegetation. Selected sites can be used for pasture, provided the ground is covered at all times. The soils need liberal applications of fertilizer, and overgrazing must be avoided. This complex is in capability unit VIe-2.

**Providence silt loam, eroded gently sloping phase**

(Pa).—This moderately well drained soil of the uplands occurs on broad ridgetops that have slopes of 2 to 5 percent. It has developed in a thin layer of loess that overlies acid sandy Coastal Plain materials. This soil is associated with the Lexington soils and with other Providence soils. It is mainly in the northern part of the county. The native vegetation was deciduous forest, chiefly oak.

**Profile description:**

- 0 to 8 inches, light yellowish-brown friable silt loam; weak fine crumb structure.
- 8 to 26 inches, yellowish-brown friable silty clay loam; moderate medium blocky structure.
- 26 to 40 inches, (siltpan) light yellowish-brown to yellowish-brown silt loam to silty clay loam; slightly to moderately compacted and brittle.
- 40 inches+, yellowish-brown brittle fine sandy loam.

The pan layer is generally more permeable than comparable layers in the Dulac and Tippah soils. The thickness of the siltpan and of the loess in which the soil developed varies.

This soil is strongly acid. It is low in organic matter and in plant nutrients. The surface soil and subsoil are permeable, but the siltpan is only slightly permeable. Runoff is medium, and internal drainage is medium to slow.

*Present use and management.*—About two-thirds of this soil has been cleared and is in crops, principally cotton, corn, and lespedeza. The crops selected depend largely on what the farmers want to grow rather than on the suitability of the soil. Although light applications of complete fertilizer are commonly used under cotton, as a rule little fertilizer is applied.

In areas that have not been cleared, the trees are mainly oak and hickory. Many of the trees are undesirable for timber. They grow slowly on this soil because of frequent burning and uncontrolled grazing.

*Management requirements.*—This soil is suited to most of the crops commonly grown in the area. Water and roots penetrate the pan layer slowly, so the soil is not suited to deep-rooted crops, such as alfalfa, or to crops that need large amounts of moisture. Hence, corn yields are generally low. A higher water-holding capacity and better productivity can be maintained by rotating crops, fertilizing in accordance with soil tests, controlling erosion where needed, and by such measures as terracing. Row crops can be grown as much as one-half the time in a rotation but not more than 2 years in succession. They should always be followed by a cover crop.

Pasture plants and close-growing crops to which this soil is suited are small grains, lespedeza, Ladino clover, white clover, bermudagrass, orchardgrass, and fescue. Good pasture management consists of clipping the weeds, controlling grazing, and fertilizing frequently. This soil is in capability unit IIe-2.

**Providence silt loam, severely eroded gently sloping phase (Pb).**—This moderately well drained siltpan soil occurs on broad ridgetops that have slopes of 2 to 5 percent. It has developed in a thin layer of loess that overlies acid sandy Coastal Plain materials. It is associated with Lexington, Ruston, and other Providence soils.

**Profile description:**

- 0 to 6 inches, light yellowish-brown friable silt loam to silty clay loam; weak fine crumb structure.
- 6 to 24 inches, yellowish-brown friable silty clay loam; moderate medium blocky structure.
- 24 to 38 inches, (siltpan) light yellowish-brown to yellowish-brown, compact brittle silt loam to silty clay loam.
- 38 inches+, yellowish-brown brittle fine sandy loam.

Erosion has removed most of the original surface layer. The present plow layer consists of remnants of the original surface soil mixed with the subsoil. The thickness and compaction of the pan varies from place to place.

This soil is strongly acid. It is low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are readily permeable, but the pan is only slowly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—Practically all of this soil is in row crops or pasture. Cotton and corn are the principal row crops, but the yields are low. Even in a normal season, corn is damaged by drought. Lespedeza is the principal hay and pasture crop. Except for cotton, which ordinarily receives applications of complete fertilizer, fertilizer is seldom used.

*Management requirements.*—This soil is suited to most of the crops commonly grown in the area. Because of severe erosion and droughtiness, however, it generally is not suited to deep-rooted crops and crops requiring much moisture. Unless the soil is carefully managed, severely eroded spots are subject to further erosion.

A better supply of organic matter and plant nutrients and a higher water-supplying capacity can be built up and maintained in this soil by using a rotation of 2 years of grasses and legumes to 1 year of row crops and by following row crops with a winter cover crop. Cultivating on the contour, using sodded waterways, terracing, and stripcropping are all practices that will help prevent erosion. Soil tests will indicate the kind of fertilizer and the amounts of fertilizer and lime to use.

This soil is suited to small grains, vetch, crimson clover, cotton, soybeans, and sorghum. It is also suited to such pasture plants as orchardgrass, bermudagrass, fescue, whiteclover, sericea lespedeza, and annual lespedeza. It is in capability unit IIIe-1.

**Providence silt loam, sloping phase (Pc).**—This is a moderately well drained siltpan soil of the uplands. It occurs on narrow ridgetops on slopes of 5 to 8 percent, mostly in the north-central part of the county. The soil has developed in a thin (typically 30 to 42 inches) layer of loess that overlies acid sandy Coastal Plain materials. It is associated with Lexington, Ruston, and other Providence soils.

Profile description:

- 0 to 8 inches, light yellowish-brown friable silt loam; weak fine crumb structure.
- 8 to 26 inches, yellowish-brown friable silty clay loam; moderate medium blocky structure.
- 26 to 40 inches, (siltpan) yellowish-brown and light yellowish-brown brittle silt loam; moderate medium angular blocky structure; slightly to moderately compacted.
- 40 inches+, yellowish-brown brittle fine sandy loam.

The thickness of the pan ranges from 6 to 14 inches. Both the degree of compaction and the thickness of the pan depend on the depth of the silt mantle and on the permeability of the underlying material.

This soil is low in organic matter and plant nutrients, and the water-supplying capacity is limited by the siltpan. The surface soil and subsoil are permeable, but the siltpan is only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—Practically all of this soil is in forest that has been cut over one or more times. The present stand consists largely of oaks and hickories

that are mainly cull trees. The growth of the trees has been stunted by frequent fires and overgrazing.

*Management requirements.*—The small areas on the narrow ridgetops, where this soil largely occurs, are undesirable for cropping and should remain in trees. In larger and more suitable areas, the soil can be cleared and used for crops. A 3-year rotation, consisting of 1 year of row crops to 2 years of close-growing crops, will help to control erosion and to build up and maintain fertility. Soil tests will indicate the need for fertilizer. Cultivating on the contour, terracing, stripcropping, and using sodded waterways are practices generally needed to control erosion.

This soil is suited to crops that do not need large amounts of moisture, as cotton, lespedeza, cowpeas, small grains, and common pasture mixtures. It is in capability unit IIIe-1.

**Providence silt loam, eroded sloping phase (Pd).**—This moderately well drained siltpan soil of the uplands occurs on slopes of 5 to 8 percent. Associated with it are Lexington and Ruston soils and other Providence soils. Most of this soil is in the north-central part of the county. It is important to the agriculture of the area. The soil has developed under a deciduous forest, chiefly of oak.

Profile description:

- 0 to 6 inches, light yellowish-brown friable silt loam; weak fine crumb structure.
- 6 to 24 inches, yellowish-brown friable light silty clay loam; moderate medium blocky structure.
- 24 to 38 inches, (siltpan) yellowish-brown and light yellowish-brown brittle silt loam; moderate medium angular blocky structure.
- 38 inches+, yellowish-brown brittle fine sandy loam.

From 25 to 75 percent of the original surface soil has been lost through erosion. In the more eroded places, the soil is lower in organic matter and plant nutrients and is more droughty than Providence silt loam, sloping phase.

The surface soil and subsoil are permeable, but the pan is only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—All of this soil has been used for crops, principally cotton, corn, cowpeas, and lespedeza, but the yields are low. A small part is now idle or in wild pasture. Ordinarily, crops are not rotated systematically. Light, and generally inadequate, applications of commercial fertilizer are commonly used, particularly under cotton.

*Management requirements.*—This soil is suited to most of the crops commonly grown in the area, but low fertility and lack of moisture limit the yields of crops that need a large amount of moisture. If the fertility level and water-holding capacity are to be raised and maintained, row crops should be grown not more than 1 year to 2 years of close-growing crops. A winter cover crop should follow the row crop. The soil needs fertilizer, but the kinds and amounts are best determined by soil tests. If row crops are to be grown, measures to control erosion, such as tilling on the contour, stripcropping, and using terraces and sodded waterways, are needed.

This soil is suited to cotton, cowpeas, lespedeza, fescue, orchardgrass, bermudagrass, white clover, and crimson clover. Alfalfa, corn, and other crops that require a great deal of moisture can be grown, but yields are generally lower than on the better drained soils. This soil is in capability unit IIIe-1.

**Providence silt loam, severely eroded sloping phase (Pe).**—This is a moderately well drained siltpan soil. It occurs on ridgetops that have slopes of 5 to 8 percent. The soil has formed in a thin layer (typically less than 42 inches) of loess that overlies acid sandy Coastal Plain materials. It is associated with Lexington, Ruston, and other Providence soils. This soil is important to the agriculture of the county.

Profile description:

- 0 to 6 inches, light yellowish-brown friable silt loam to silty clay loam; weak medium blocky structure.
- 6 to 22 inches, yellowish-brown friable light silty clay loam; moderate medium blocky structure.
- 22 to 36 inches, (siltpan) yellowish-brown and light yellowish-brown brittle silt loam; moderate medium angular blocky structure.
- 36 inches+, yellowish-brown brittle fine sandy loam.

Most of the original surface layer has been removed through erosion and, in places, a part of the subsoil has been lost. A few shallow gullies have formed. The present plow layer consists of a mixture of the remnants of the original surface soil and the upper part of the subsoil. This has caused the texture of the plow layer to be heavier than that of the uneroded soil and has resulted in faster runoff, a lower rate of permeability, lower organic-matter content, and increased droughtiness.

This soil is strongly acid. It is low in fertility and in water-holding capacity. The pan layer is only slightly permeable.

*Present use and management.*—All of this soil has been cropped, but much of it is now idle or in wild pasture. The present vegetation is not sufficient to check erosion, and the soil is becoming less productive. Where the soil is cropped, yields are low. Fertilizer generally is not applied. Even in normal seasons, corn usually is damaged by drought. Alfalfa and kudzu are not generally grown because of the moderately low yields and the difficulty in maintaining a stand.

*Management requirements.*—This soil is best suited to hay and pasture. If row crops are needed, a rotation in which they are grown only once every 6 years is best. Cultivating should be done on the contour and waterways left in sod. If the soil is cultivated, terraces or stripcropping or both generally are needed to control erosion. Soil tests will indicate the need for fertilizer.

Pasture and hay crops to which the soil is well suited include fescue, whiteclover, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. Small grains, vetch, crimson clover, and such drought-resistant crops as cotton and cowpeas can also be grown. This soil is in capability unit IVE-1.

**Providence silt loam, severely eroded strongly sloping phase (Pf).**—This is a moderately well drained siltpan soil of the uplands. It occurs on slopes of 8 to 12 percent. The soil has developed in a thin layer (typically 40 inches or less) of loess that overlies acid sandy Coastal Plain materials. It is associated with Lexington, Ruston, and other Providence soils.

Profile description:

- 0 to 6 inches, light yellowish-brown friable silt loam to silty clay loam; weak fine crumb to weak medium blocky structure.
- 6 to 22 inches, yellowish-brown friable light silty clay loam; moderate medium blocky structure.

22 to 36 inches, (siltpan) yellowish-brown and light yellowish-brown brittle silt loam; moderate medium angular blocky structure.

36 inches+, yellowish-brown brittle fine sandy loam.

On most of this soil, erosion has been severe. Most of the original surface soil has been removed and part of the subsoil. Some small areas are uneroded or only moderately eroded.

This soil is low in organic matter, in plant nutrients, and in water-holding capacity. The surface soil and subsoil are permeable, but the pan layer is only slightly permeable. Runoff is rapid, except on the uneroded areas, and internal drainage is slow.

*Present use and management.*—All of the severely eroded to moderately eroded areas have been cleared and once were cropped. The uneroded areas are in cutover forests. Many of the cleared areas are now idle or in unimproved pasture. Present vegetation is not sufficient to prevent further severe erosion. Because of intensive cropping and inadequate use of fertilizer, yields are low. Even in normal seasons, corn is damaged by drought.

*Management requirements.*—This soil should be used for hay or pasture. Forested areas are best left in trees and protected from fire and overgrazing.

If it is necessary to grow row crops on this soil, they are best grown in a rotation only once every 6 years. Cultivating should be done on the contour, and waterways left in sod. Stripcropping and terracing may be needed.

For good pasture management use sod-forming grasses and legumes, regulate grazing, and apply fertilizer frequently. Soil tests will indicate the kinds and amounts of lime and fertilizer needed.

Pasture and hay crops to which this soil is suited are vetch, fescue, small grains, white and crimson clover, bermudagrass, sericea lespedeza, and other lespedezas. Drought-resistant crops, such as cotton and cowpeas, can be grown. This soil is in capability unit IVE-1.

**Ruston fine sandy loam, sloping phase (Ra).**—This is a well-drained sandy soil of the uplands. It has developed under deciduous forest in sandy Coastal Plain materials. This soil occurs on ridges that have slopes of 5 to 8 percent. It is associated with Lexington, Providence, and other Ruston soils.

Profile description:

0 to 16 inches, light yellowish-brown very friable fine sandy loam.

16 to 26 inches, yellowish-brown to yellowish-red fine sandy clay loam; abrupt transition to loamy sand at a depth of 26 inches.

26 inches+, yellowish-red loose loamy sand.

A few sandstone fragments are on the surface and throughout the profile. In some areas there are boulders.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-supplying capacity. It is permeable. Runoff is medium, and internal drainage is rapid.

*Present use and management.*—Practically all of this soil is in forests of cutover hardwoods consisting mainly of hickory and oak. Frequent burning has reduced the quality of the stand, and many of the larger trees are culls.

*Management requirements.*—Although this soil is suited to field crops, it occurs in small areas that are isolated by soils undesirable for cropping. If cleared, it is highly erodible. Wooded areas are best left in trees but must be protected from fire.

If the soil is cleared, erosion must be controlled and moisture conditions improved. One year of a row crop to 2 years of close-growing crops is a good rotation to use. Cultivating on the contour, terracing, and using sodded waterways are practices generally needed. Crop residues and cover crops worked into the soil will help maintain or increase the amount of organic matter. It is well to determine the need for lime and fertilizer by soil tests.

This soil is suited to cotton, corn, and soybeans, but corn may be damaged by drought in dry seasons. Fescue, small grains, whiteclover, bermudagrass, sericea lespedeza, and other lespedezas can be grown. Alfalfa and red clover need good management including the use of heavy applications of fertilizer. This soil is in capability unit IIIe-2.

**Ruston fine sandy loam, moderately steep phase (Rb and Rc).**—This somewhat excessively drained upland soil occurs on ridge slopes of 12 to 25 percent. Some of it occupies slopes of 8 to 12 percent. It has developed under hardwood forests in acid sandy Coastal Plain materials. The soil is associated with Lexington and other Ruston soils.

*Profile description:*

- 0 to 20 inches, light yellowish-brown very friable fine sandy loam.
- 20 to 36 inches, brownish-yellow friable light sandy clay loam; weak medium blocky structure.
- 36 inches+, yellowish-red loose loamy fine sand.

The texture of the subsoil ranges from sandy clay loam to fine sandy loam. Generally, the profile of this soil is thinner on the steeper slopes. This soil is virtually uneroded, although recently a few areas were cleared and are now moderately eroded.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-holding capacity. It is rapidly permeable. Runoff is medium to rapid, and internal drainage is rapid.

*Present use and management.*—Practically all of this soil is in forests of cutover hardwoods. The heavy thinning of sawtimber and the frequent burning have reduced the quality of the stand until most of the mature trees are culls. Trees grow fairly rapidly on this soil, and future stands of oak, hickory, and poplar are promising. A few areas have been cleared recently and put in pasture, but yields are low under the present management. As a rule erosion is active before pastures can become well established.

*Management requirements.*—If not needed for pasture, this soil should remain in trees. It is important to protect the trees from fire and replace culls with either young hardwoods or pines. If this soil must be cleared and used for pasture, tilling should be done on the contour and overgrazing avoided. Weeds should be clipped. It may be desirable to establish the pasture in alternating strips so that not more than one-half the slope at any one time will be bare and exposed to erosion. Heavy applications of lime and fertilizer will generally be needed. The kinds and amounts are best determined by soil tests.

This soil is suited to fescue, whiteclover, kudzu, bermudagrass, sericea lespedeza, and annual lespedeza. Any excess growth can be cut for hay. This soil is in capability unit VIe-2.

**Ruston fine sandy loam, steep phase (Rd).**—This somewhat excessively drained soil of the uplands occurs on ridge slopes of more than 25 percent. It has developed

under deciduous forest in acid, sandy Coastal Plain materials. It is associated with Lexington and other Ruston soils.

*Profile description:*

- 0 to 20 inches, light yellowish-brown loose fine sandy loam.
- 20 to 36 inches, brownish-yellow friable sandy clay loam; weak medium blocky structure.
- 36 inches+, yellowish-red loamy fine sand.

Generally, on the steeper slopes, the profile of this soil is thinner and not so well developed as on the milder slopes. The texture of the subsoil ranges from sandy clay loam to loamy fine sand.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-holding capacity. Permeability is very rapid. Runoff is medium to rapid, and internal drainage is rapid.

*Present use and management.*—All of this soil is in hardwood forest, chiefly of oak, hickory, and dogwood. Trees grow fairly rapidly, but frequent fires and cutting have reduced greatly the quality of the stand.

*Management requirements.*—This soil is not suited to row crops. Because of its low fertility, droughtiness, and strong slopes, it should remain in forest. Good management practices consist of protecting the forests from fire and replacing cull trees with pines or hardwoods.

If this soil must be used for pasture, plants that can be grown are sericea lespedeza, bermudagrass, fescue, and kudzu. Grazing must be regulated. Fertilizer should be used according to the needs indicated by soil tests. This soil is in capability unit VIIe-2.

**Ruston sandy clay loam, severely eroded sloping phase (Re).**—This well-drained, yellowish-brown soil occurs on narrow ridgetops that have slopes of 5 to 8 percent. It has developed under deciduous forest in sandy Coastal Plain materials. Associated with it are the Lexington, Providence, and other Ruston soils.

*Profile description:*

- 0 to 6 inches, yellowish-brown very friable sandy clay loam; very weak medium blocky structure.
- 6 to 12 inches, strong-brown to yellowish-brown, friable sandy clay loam; weak medium blocky structure.
- 12 inches+, yellowish-red loose loamy fine sand.

The texture of the subsoil ranges from sandy clay loam to loamy fine sand. The color of the substratum is highly variable. More than 75 percent of the original surface soil has been lost through erosion and, in places, a considerable part of the subsoil. A few areas that have been cleared recently, however, are only moderately eroded.

This soil is acid. It is low in organic matter, in plant nutrients, and in water-supplying capacity. The soil is permeable, and even during normal seasons it is droughty. Runoff is medium, and internal drainage is rapid.

*Present use and management.*—All of this soil has been row cropped. Now practically all of it is in wild pasture or idle. A few areas are in cotton, but even though fertilized, yields are low. Ordinarily alfalfa and corn are damaged by drought. Lespedeza has been planted in most of the pastures. Fertilizer is not commonly applied, and the stand is generally thin.

*Management requirements.*—This soil is droughty and is highly erodible. It is best used for hay and pasture. If row crops are needed, cotton and soybeans can be grown, but not more than once in 5 or 6 years. Tillage should be on the contour and waterways left in sod.

Terraces may be needed. Heavy applications of lime and fertilizer are generally required, but the needs should be determined by soil tests.

For good pasture management, it is well to regulate grazing, clip weeds, and apply fertilizer frequently. The soil is suited to such hay and pasture plants as fescue, whiteclover, kudzu, bermudagrass, sericea lespedeza, and annual lespedeza. It is in capability unit IVE-2.

**Ruston sandy clay loam, severely eroded moderately steep phase** (Rf and Rg).—This somewhat excessively drained soil of the uplands occurs chiefly on ridge slopes of 12 to 25 percent. Some of this soil is on slopes of 8 to 12 percent. The soil has developed under hardwood forest in acid sandy Coastal Plain materials. This soil differs from Ruston fine sandy loam, moderately steep phase, as a result of being more eroded. Associated with it are Lexington soils and other Ruston soils.

Profile description:

0 to 16 inches, brownish-yellow friable light sandy clay loam.  
16 inches+, yellowish-red loose loamy fine sand.

The texture of the subsoil ranges from clay loam to loamy fine sand. Severe erosion has removed more than 75 percent of the original surface soil, and in many places most of the subsoil has washed away. The texture of the present plow layer is heavier than that of the original plow layer. Shallow gullies are common.

This soil is low to very low in organic matter, in plant nutrients, and in water-holding capacity. It is rapidly permeable and droughty. Runoff and internal drainage are rapid.

*Present use and management.*—All of this soil has been cropped, but practically all of it is now idle. Vegetation is not sufficient to check erosion, and sheet and gully erosion are active. Lespedeza is grown in some places, and stands are thin. When cotton and corn are grown, yields are very low.

*Management requirements.*—This soil should be covered by permanent vegetation, such as pine trees. Selected sites can be used for pasture, provided the ground is well covered at all times after the pasture is established. This can best be done by taking care not to overgraze and by using heavy applications of lime and fertilizer frequently. Soil tests will indicate the kinds and amounts of amendments needed.

This soil is suited to bermudagrass, sericea lespedeza, fescue, and kudzu. It is in capability unit VIe-2.

**Ruston sandy clay loam, severely eroded steep phase** (Rh).—This somewhat excessively drained soil of the uplands occurs on ridge slopes of more than 25 percent. It has developed under deciduous forest in acid sandy Coastal Plain materials. The soil differs from Ruston fine sandy loam, steep phase, in being more eroded. It is associated with Lexington and other Ruston soils.

Profile description:

0 to 16 inches, brownish-yellow fine sandy loam to sandy clay loam; weak medium blocky structure.  
16 inches+, yellowish-red loamy fine sand.

The texture of the subsoil ranges from loamy fine sand to clay loam. Severe erosion has removed more than 75 percent of the original surface soil, and in many places, all or part of the subsoil. The texture of the present surface soil is substantially heavier than that of the original.

This soil is acid. It is low in organic matter, in plant

nutrients, and in water-holding capacity. Permeability of all the layers is very rapid, and the soil is droughty. Runoff and internal drainage are rapid.

*Present use and management.*—All of this soil has been cropped, but most of it is now idle, or in wild pasture, or has been planted to pines. Except where pines have stabilized erosion, there is generally not enough vegetation to stop erosion.

*Management requirements.*—Because of the high risk of erosion, this soil should be kept in trees or other permanent vegetation. Pine trees grow well. Selected sites may be used for pasture, provided the ground is kept covered with vegetation after the pasture is established. This can best be done by fertilizing and by limiting grazing. Soil tests will indicate the kinds and amounts of amendments needed.

The soil is suited to bermudagrass, sericea lespedeza, fescue, and kudzu. It is in capability unit VIIe-2.

**Sandy alluvial land** (Rk).—This land type consists of 12 or more inches of unproductive sand recently deposited on bottom or local alluvial soils. It is scattered throughout the county. It lies next to gullied areas in small draws, on foot slopes, and on natural levees of the larger streams. This land type is associated with bottom and local alluvial soils of the Hymon, Ina, and Beechy series and with upland soils from which the material washed. The thickness of the fresh sand deposits ranges from 12 to 48 inches. Many areas are subject to overflow, or runoff deposits sand on them. Although permeability and internal drainage are generally good, the water table is usually high in winter, and the land is droughty in summer.

*Present use and management.*—Most of the areas have been cropped, but because of low productivity, they are now idle or in wild pasture. For convenience in tilling, a few areas that occur in fields with other soils are cropped in the same way as the adjoining soils. Yields are low.

*Management requirements.*—Because of unfavorable moisture conditions, this land type is best suited to trees or pasture. Whatever its use, erosion should be stopped on the areas from which sand is being washed. Diversions can be used to intercept runoff, which damages this and other bottom soils.

For good forest management, the farmer must select suitable trees, prevent fire, and control grazing.

Good pasture management will include proper liming and fertilizing, regulating grazing, and selecting suitable plants. The kinds and amounts of amendments needed can be determined by soil tests.

Fescue, bermudagrass, and Ladino clover can be grown on selected areas. This soil is in capability unit IVw-1.

**Shannon silt loam, local alluvium phase** (Sa).—This is a well-drained local alluvial soil. It occurs in small draws, in depressions, and on foot slopes that are widely scattered throughout the county. It consists of mixed material washed from soils that have formed in loess and sandy Coastal Plain materials. This soil is associated with other local alluvial soils and with the soils from which its parent materials washed, mainly the Lexington and Ruston.

Profile description:

0 to 6 inches, dark grayish-brown very friable silt loam; weak fine granular structure.  
6 to 42 inches, dark-brown friable silt loam; weak medium granular structure.

The amount of sand varies throughout the profile. The texture of the surface soil ranges from silt loam to fine sandy loam.

This soil is high in organic matter, in plant nutrients, and in water-holding capacity. It is readily permeable. Runoff and internal drainage are medium.

A few small areas of well-drained bottom soils are included in this mapping unit.

*Present use and management.*—All of this soil is in crops, mainly cotton and corn. It is row cropped intensively, and yields are moderately high. Generally, fertilizers and winter cover crops are not used.

*Management requirements.*—This soil is suited to all of the crops commonly grown in the area. Row crops should be grown not more than 2 years in succession, and a winter cover crop should follow each row crop. The soil should be protected by diversion ditches if water runs off adjacent slopes. Even though the soil produces well, yields can be improved by fertilizing properly.

This soil is well suited to cotton, corn, soybeans, small grains, and truck crops. It is also well suited to such hay and pasture crops as alfalfa, red clover, white clover, orchardgrass, fescue, and lespedeza. It is in capability unit IIw-1.

**Shubuta-Cuthbert loams, moderately steep phases (Sb).**—This complex consists of well drained to moderately well drained soils of the uplands. The soils occur on ridge slopes of 12 to 25 percent. They have formed in sandy clay Coastal Plain materials. The Shubuta soil differs from the Cuthbert mainly in having a more developed profile. The B horizon of the Shubuta soil may be thicker and redder than that of the Cuthbert. In many areas the Shubuta soil is more plastic. The soils of this complex are associated with Silerton, Dulac, Tippah, Ruston, and with other Shubuta and Cuthbert soils. They have developed under a hardwood forest.

Profile description (Shubuta fine sandy loam):

- 0 to 7 inches, olive-brown very fine sandy loam; very friable.
- 7 to 14 inches, yellowish-red very firm clay with some grit and mica flakes; strong medium subangular blocky structure; gradual boundary.
- 14 inches+, red and olive very firm sandy clay or clay.

Profile description (Cuthbert very fine sandy loam):

- 0 to 5 inches, yellowish-brown very friable very fine sandy loam.
- 5 to 12 inches, yellowish-brown brittle very fine sandy clay; moderate medium blocky structure.
- 12 inches+, mottled or streaked reddish-yellow and gray thin beds of clay and sandy material.

In the upper few inches of some areas of both soils an appreciable amount of silt is mixed with the sand. The content of mica flakes, green sand, and sandstone fragments in the substratum varies considerably from place to place. The B horizon of the Shubuta soil is only slightly developed on the stronger slopes, but it is well developed on the milder slopes. Some areas of Shubuta soil have less sand throughout the profile than is typical. Some of these areas have a layer of marl at a depth of about 34 inches, but they are so small that they are included in this mapping unit.

These soils are moderately to strongly acid. They are moderately low in organic matter and low in plant nutrients and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum appears to be less permeable. Runoff is rapid, and internal drainage is moderate to slow.

*Present use and management.*—Practically all of this complex is in forests of cutover hardwoods, chiefly oak, beech, hickory, and poplar. Some areas have been burned over, and most have had the salable timber removed. Trees grow rapidly on these soils.

*Management requirements.*—These soils are droughty, somewhat low in natural fertility, and subject to erosion when cleared. They should remain in trees. The most important part of forest management here is to prevent fire and replace cull trees.

If cleared, these soils are suited only to hay and pasture and other permanent vegetation. Except for seeding, they should not be plowed or disked. The need for lime and fertilizer will best be determined by soil tests. The soils are suited to bermudagrass, whiteclover, fescue, sericea lespedeza, and other lespedezas. They are in capability unit VIe-3.

**Shubuta-Cuthbert loams, steep phases (Sc).**—This complex consists of moderately well drained to well drained soils of the uplands. The soils occur on hillsides that have slopes greater than 25 percent. They have formed in sandy clay Coastal Plain materials. The Shubuta soil differs from the Cuthbert in having a redder and more plastic subsoil. The profile development of both the Shubuta and Cuthbert soils is generally less pronounced than on milder slopes. This complex is in the same general area as other Shubuta and Cuthbert soils. The soils have developed under deciduous forest.

These soils are acid. They are moderately low to low in organic matter and low in natural fertility and water-supplying capacity. Although an appreciable amount of moisture is held by the heavier textured layers, it does not appear to be available to plants during the dry summer months. The surface soil and subsoil are permeable, but the substratum is apparently less permeable. Runoff is very rapid, particularly on the severely eroded areas, and internal drainage is slow to medium.

Included in this mapping unit are areas of severely eroded Shubuta and Cuthbert soils on steep slopes. The dominant texture of the plow layer in these included soils is sandy clay. In many places the substratum is exposed.

*Present use and management.*—Most of this complex is in forests of cutover hardwoods consisting chiefly of oak, hickory, beech, and poplar. Although cut over one or more times, the trees grow rapidly. The severely eroded included areas have been cleared and cropped, but most are now idle or in wild pasture. A few areas are in bermudagrass, which supplies pasture during part of the year. Pastures are not commonly fertilized, and consequently yields are low.

*Management requirements.*—The soils of this complex are droughty, low in natural fertility, and severely eroded or subject to severe erosion if they are cleared. If forested, they should be left in trees and protected from fire. Undesirable trees should be replaced. Where already cleared, the soils should be replanted to pines or other trees. On selected sites, however, such plants as bermudagrass, kudzu, sericea lespedeza, fescue, and whiteclover can be grown, but overgrazing should be avoided. The soils on these sites need liberal applications of lime and fertilizer. Soil tests will indicate the kinds and amounts of amendments needed. These soils are in capability unit VIIe-2.

**Shubuta-Cuthbert sandy clays, severely eroded sloping phases (Sd).**—The soils of this complex are well drained to

moderately well drained. They occur on ridgetops that have slopes of 5 to 8 percent. The soils have developed in sandy clay Coastal Plain materials. The Shubuta soil differs from the Cuthbert mainly in having a more developed profile. The B horizon of the Shubuta soil is generally thicker and redder than that of the Cuthbert. In many areas it is more plastic. The soils are associated with Silerton, Dulac, Tippah, Ruston, and with other Shubuta and Cuthbert soils. The native vegetation was hardwood forest.

In some places the upper few inches of both soils have appreciable amounts of silt mixed with the sand. The content of mica flakes, green sand, and sandstone fragments in the substratum varies considerably from place to place. The development and the thickness of the B horizon varies in the Shubuta soil. This horizon is slightly developed on the stronger slopes but is well developed on the milder slopes. Some areas have less sand throughout the profile than is typical of the Shubuta soil, and some of these areas have a layer of marl at a depth of about 34 inches.

These soils are moderately to strongly acid. They are moderate to low in organic matter and plant nutrients and have a moderate to low water-supplying capacity. The surface soil and subsoil are permeable, but the substratum appears to be less permeable. The soils tend to be droughty. Runoff is medium to rapid, and internal drainage is medium to slow.

This mapping unit includes all of the slightly to moderately eroded Shubuta-Silerton soils on 5 to 8 percent slopes. Slightly to severely eroded Shubuta and Silerton soils on 8 to 12 percent slopes are also included.

*Present use and management.*—Most of this complex has been cropped, but a few areas are in forest of cutover hardwoods, consisting chiefly of oak, hickory, and beech. Lespedeza, cotton, and corn are the principal crops, but some areas have improved pastures of fescue and whiteclover or of orchardgrass and whiteclover. Row crops on these soils lack available moisture. Ordinarily they are not fertilized or rotated systematically, and yields are generally low.

*Use and management requirements.*—These soils are droughty, somewhat low in natural fertility, and severely eroded. Furthermore, they are subject to severe erosion if cleared (fig. 9). They are therefore best suited to hay and pasture. Trees grow at a rapid rate, so it is probably best to leave forested areas in trees. If row crops are needed, they should be grown only on selected areas and not more than once in every 5 or 6 years. If these soils are row cropped, terracing, cultivating on the contour, stripcropping, and using sodded waterways are practices that may be needed. Soil tests will indicate the kinds and amounts of amendments needed. Ordinarily, grazing should be limited during the dry summer months.

Pasture and hay plants such as fescue, bermudagrass, orchardgrass, whiteclover, kudzu, sericea lespedeza, and annual lespedeza grow well. Such row crops as cotton, cowpeas, and soybeans will grow, but yields are generally low. This complex is in capability unit IVE-3.

**Shubuta-Cuthbert sandy clays, severely eroded moderately steep phases (Se).**—The soils of this complex are moderately well drained to well drained and occur on hillsides that have slopes of 12 to 25 percent. They have formed in sandy clay Coastal Plain materials under a hardwood forest. The soils are in the same general area



Figure 9.—Road cut through severely eroded Shubuta-Cuthbert sandy clays well stabilized with bermudagrass.

as Shubuta-Cuthbert loams, moderately steep phases, but differ mainly in being more eroded.

A few small areas have a marl layer at a depth of about 34 inches. More than 75 percent of the original surface soil has been lost, and in places the subsoil is so eroded that the substratum is exposed. The dominant texture of the present plow layer is sandy clay.

These soils are moderately to strongly acid. They are moderately low in organic matter and low in natural fertility and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum is less permeable. Runoff is rapid, and internal drainage is medium to slow.

*Present use and management.*—All of this complex has been cropped, although most of it is now in hay or pasture or is idle (fig. 10). Lespedeza is the commonest pasture and hay crop, but yields are extremely low. There are a few improved pastures that consist chiefly of fescue and whiteclover or of bermudagrass and whiteclover. Except on improved pastures, fertilizer is not commonly used.

*Management requirements.*—The soils of this complex are suited only to hay, pasture, and other permanent vegetation. They should not be plowed or disked except for



Figure 10.—Severely eroded Shubuta soils. Field at left has been leveled and seeded to pasture.

seeding. The need for lime and fertilizer is best determined by soil tests. Grazing must be limited during the dry summer months.

These soils are suited to such hay and pasture plants as fescue, whiteclover, bermudagrass, sericea lespedeza, and annual lespedeza. This soil complex is in capability unit VIe-3.

**Shubuta-Cuthbert-Silerton soils, sloping phases (Sf).**—The soils of this complex are so intermingled that it was not feasible to separate them on a map of the scale used. They occur on sloping to strongly sloping ridges. All of the soils are moderately well drained to well drained. The Shubuta and Cuthbert soils have developed in sandy clay Coastal Plain materials. The Silerton soil has developed in a thin layer (12 to 42 inches) of loess that overlies sandy clay or clay Coastal Plain materials. The Shubuta soil differs from the Cuthbert in having a redder color and a plastic, rather than a brittle, subsoil. The soils are associated with Dulac, Tippah, Ruston, and other Shubuta, Cuthbert, and Silerton soils. The native vegetation was deciduous forest.

Profile description (Shubuta fine sandy loam):

- 0 to 7 inches, olive-brown very friable very fine sandy loam.
- 7 to 14 inches, yellowish-red very firm clay containing some grit and mica flakes; strong medium subangular blocky structure.
- 14 inches+, red and olive very firm sandy clay.

Profile description (Cuthbert silt loam):

- 0 to 4 inches, dark yellowish-brown very friable silt loam; weak fine crumb structure.
- 4 to 12 inches, yellowish-brown friable loam; weak medium subangular blocky structure.
- 12 inches+, yellowish-red sandy clay Coastal Plain materials; contains mica flakes and layers of sand.

Profile description (Silerton silt loam):

- 0 to 7 inches, light yellowish-brown friable silt loam; very weak medium subangular blocky structure.
- 7 to 24 inches, brown to dark-brown firm silty clay loam; moderate medium blocky structure.
- 24 inches+, yellowish-red sandy clay; light-gray splotches; massive structure.

The amount of mica flakes and green sand in the substratum of these three soils varies considerably from place to place. In most places the upper few inches of Shubuta and Cuthbert soils has appreciable amounts of silt mixed with the sand. The development and thickness of the B horizon vary in both the Shubuta and Cuthbert soils. This horizon is only slightly developed on the stronger slopes and well developed on the milder slopes. Erosion losses range from slight to moderate but are not great enough to alter appreciably the texture of the original surface soil.

These soils are acid. They are moderately low to low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum is less permeable. Runoff is medium to rapid, and internal drainage is medium to slow.

*Present use and management.*—About 75 percent of this complex is on the tops of narrow sloping ridges that are in forests of cutover hardwoods. The principal trees are oak, hickory, beech, and poplar. Frequent burning and removal of salable timber have reduced the quality of the stand. Trees grow rapidly, however, on these soils. About 25 percent of the complex is used for row crops and pasture. The principal crops are lespedeza, cowpeas,

cotton, and corn, but yields are generally low. Except for cotton, fertilizer is not commonly used. Cotton ordinarily receives complete fertilizer.

*Management requirements.*—Because these soils are low in natural fertility, somewhat droughty, and subject to severe erosion when cropped, they should be used only in moderately long rotations. Row crops should be followed by at least 2 or 3 years of close-growing grasses and legumes. Cultivating on the contour, terracing, and using sodded waterways are practices commonly needed. The need for lime and fertilizer can be determined by soil tests. Grazing should be regulated during the dry summer months.

These soils are suited to most of the row crops commonly grown in the county. Corn yields, however, are sometimes lowered by lack of moisture during the dry summer months. Fescue, kudzu, orchardgrass, bermudagrass, small grains, vetch, crimson clover, white clover, sericea lespedeza, and other lespedezas grow well. This soil complex is in capability unit IVe-3.

**Shubuta-Cuthbert-Silerton soils, severely eroded sloping phases (Sg).**—The soils of this complex are well drained to moderately well drained. They occur on upland slopes of 5 to 12 percent. The Shubuta and Cuthbert soils have developed in sandy clay Coastal Plain materials. The Silerton soil has developed in a thin layer of loess that overlies sandy clay Coastal Plain materials. These soils are adjacent to or in the same general area as Shubuta-Cuthbert-Silerton soils, sloping phases.

Erosion has caused the loss of more than 75 percent of the original surface soil. In many places part or all of the subsoil has been lost. The present plow layer consists of remnants of the original surface layer mixed with material from the subsoil or substratum. The texture ranges from sandy clay in the Shubuta and Cuthbert soils to silt loam in the Silerton soil.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum is less permeable. Runoff is medium to rapid, and internal drainage is medium to slow.

*Present use and management.*—All of this complex has been cropped. At present about 75 percent is in row crops, hay, and pasture, and the rest is idle or in wild pasture. The principal crops are lespedeza, cowpeas, cotton, and corn, and yields are low. As a rule crops are not rotated systematically nor fertilized, but cotton generally receives complete fertilizer.

*Management requirements.*—This complex is best suited to hay and pasture, because it is eroded, droughty, and low in fertility. If row crops are needed, they should be grown not more than once every 5 or 6 years. If the soils are row cropped, cultivating on the contour, strip-cropping, using sodded waterways, and terracing are practices that may be needed. It is well to determine the need for lime and fertilizer by soil tests.

The soils are best suited to pasture or hay plants such as bermudagrass, orchardgrass, fescue, whiteclover, sericea lespedeza, and annual lespedeza. Care must be taken not to overgraze the pastures during the long summer months. Cotton, cowpeas, and soybeans will grow, but yields are generally low. The soils of this complex are in capability unit IVe-3.

**Shubuta-Cuthbert-Silerton soils, moderately steep phases (Sh).**—This complex is made up of well drained to moderately well drained soils of the uplands. It occurs on ridge slopes of 12 to 25 percent. The Shubuta and Cuthbert soils have developed in sandy clay Coastal Plain materials. The Silerton soil has developed in a thin layer of loess. This complex is in the same general area as Shubuta-Cuthbert-Silerton soils, severely eroded sloping phases. It differs from that complex mainly as a result of having stronger slopes. Also in most places it is less eroded, although generally the soils on stronger slopes have thinner, less developed profiles. Some areas are moderately eroded. The soils have developed under deciduous forest.

These soils are acid. They are moderately low to low in organic matter and low in natural fertility and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum is less permeable. Runoff is rapid, and internal drainage is medium to slow.

*Present use and management.*—Most areas are in forests of cutover hardwoods that consist mainly of oak, hickory, beech, and poplar. Some areas have been burned over. Trees grow rapidly on these soils.

About 5 percent of this complex has been cleared recently and put in pasture. The pasture plants most commonly grown are bermudagrass, lespedeza, fescue, and whiteclover. About 50 percent of the pastures have been fertilized and afford moderate grazing. Row crops are not generally grown.

*Management requirements.*—It is best to leave the forested areas in trees. The forests need to be protected from fire and to have undesirable trees replaced. The cleared areas are best used for pasture and hay. They should be tilled only when preparing a seedbed. The soils need lime and fertilizer. Good management will include the use of soil tests to determine the kinds and amounts of amendments needed. Care is needed to keep the pasture from being overgrazed during the dry summer months.

These soils are suited to such pasture and hay plants as fescue, whiteclover, bermudagrass, sericea lespedeza, and common lespedeza. The soils of this complex are in capability unit VIe-3.

**Shubuta-Cuthbert-Silerton soils, severely eroded moderately steep phases (Sk).**—This complex consists of well drained to moderately well drained soils of the uplands. The soils occur on ridge slopes of 12 to 25 percent. They are so intermingled that it was not feasible to separate them on a map of the scale used. The Shubuta and Cuthbert soils have developed in sandy clay Coastal Plain materials. The Silerton has formed in a thin layer of loess that overlies sandy clay Coastal Plain materials.

This complex occurs in the same general area as Shubuta-Cuthbert-Silerton soils, severely eroded sloping phases. It differs mainly as a result of having stronger slopes. As is true of most soils on stronger slopes, the soils have a thinner, less developed profile than those on less sloping areas.

More than 75 percent of the original surface layer has been lost through erosion. The texture of the present plow layer ranges from sandy clay in the Cuthbert and Shubuta soils to silt loam in the Silerton.

These soils are acid. They are very low in organic matter, in natural fertility, and in water-supplying capacity. They are droughty. The surface soil and subsoil are permeable, but the substratum appears to be less

permeable. Runoff is very rapid, and internal drainage is moderate to slow.

*Present use and management.*—All of this complex has been cropped. When the surface layer became eroded, the soils were either abandoned or put in pasture. About 50 percent is idle or in wild pasture, and the rest is in lespedeza, bermudagrass, or fescue and whiteclover. The pastures are generally not fertilized adequately. On most areas yields are low and erosion is active.

*Management requirements.*—These soils need to be kept in hay and pasture or other permanent vegetation. They should only be cultivated to prepare for reseeding. Tillage should be on the contour. Frequent fertilizing is needed. Soil tests will indicate the kinds and amounts of amendments to use.

The soils of this complex are suited to hay and pasture plants, such as whiteclover, fescue, bermudagrass, sericea lespedeza, and common lespedeza. They are in capability unit VIe-3.

**Shubuta-Ruston-Silerton soils, sloping phases (Sl).**—The soils of this complex are so intermingled that it was not feasible to separate them on a map of the scale used. All are well-drained upland soils. They occur on ridgetops that have slopes of 5 to 12 percent. The predominant slopes are 5 to 8 percent, but in some areas the slopes are 8 to 12 percent. The Shubuta soil has developed in sandy clay Coastal Plain materials and the Ruston in sandy Coastal Plain materials. The Silerton soil has developed in a thin layer (10 to 24 inches) of loess that overlies sandy clay Coastal Plain materials. The soils occur in the extreme eastern and southeastern parts of the county in association with Dulac, Cuthbert, and other Shubuta, Ruston, and Silerton soils. They have formed under deciduous forest.

Profile description (Shubuta fine sandy loam):

- 0 to 7 inches, olive-brown very friable very fine sandy loam.
- 7 to 14 inches, yellowish-red very firm clay; contains some grit and mica flakes; strong medium subangular blocky structure.
- 14 inches+, red and olive very firm sandy clay.

Profile description (Ruston fine sandy loam):

- 0 to 24 inches, light yellowish-brown loose fine sandy loam.
- 24 to 36 inches, brownish-yellow to strong-brown friable sandy clay loam; very weak medium blocky structure.
- 36 inches+, reddish-yellow loamy sand; a few light yellowish-brown mottles.

Profile description (Silerton silt loam):

- 0 to 7 inches, light yellowish-brown silt loam; weak medium subangular blocky structure.
- 7 to 24 inches, brown firm silty clay loam; moderate medium blocky structure.
- 24 inches+, yellowish-red and olive very firm sandy clay Coastal Plain materials.

All three soils in this complex vary in thickness and in degree of profile development. Generally, on the stronger slopes, the profiles are thinner and not so well developed. The B horizon of the Shubuta soil varies in thickness. The profile is very slightly developed to well developed. The content of sandstone fragments, green sand, and mica flakes in the Shubuta substratum varies considerably from place to place. The texture of the Ruston subsoil ranges from clay loam to loamy fine sand and the color from brownish yellow to red. Included in the Silerton soil are some areas in which there are incipient pans that are only moderately permeable. Erosion losses on this mapping

unit range from virtually none to as much as 75 percent of the original surface soil.

These soils are acid. They are moderately low to low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum of the Shubuta and Silerton soils appears to be less permeable. The Ruston substratum is highly permeable. Runoff is medium in all of the soils, and internal drainage is medium to rapid. Included in this mapping unit are a few small areas of Cuthbert soils.

*Present use and management.*—About one-half of this complex is cropped. The rest is in forests of cutover hardwoods that consist mainly of oak, hickory, and beech. Most of the forested areas are on narrow ridgetops and are isolated by soils undesirable for row crops. Fires and removal of salable timber have reduced the quality of the stand.

Of the cleared areas, about one-third is in row crops, consisting mainly of cotton, corn, and soybeans, and about two-thirds is in hay or pasture, mainly lespedeza. The yields are generally low. Crops are not commonly rotated, and, except for cotton, they ordinarily are not fertilized.

*Use and management requirements.*—These soils are somewhat droughty and are subject to severe erosion when cleared. Therefore the rotation should consist of at least 2 years of close-growing grasses and legumes to each year of row crops. Cultivating on the contour, terracing, and using sodded waterways are practices generally needed. Crop residues and cover crops turned under will improve the soils by helping to maintain or increase the content of organic matter. The need for lime and fertilizer will best be determined by soil tests.

These soils are suited to small grains, cotton, soybeans, and cowpeas. Corn can be grown, but yields are usually reduced by drought. The soils are also suited to such hay and pasture plants as kudzu, fescue, vetch, orchardgrass, white clover, crimson clover, sericea lespedeza, and annual lespedeza. As a rule alfalfa and red clover are damaged by drought. Care is necessary to keep the pastures from being overgrazed. The soils of this complex are in capability unit IVE-3.

**Shubuta-Ruston-Silerton soils, severely eroded strongly sloping phases (Sm).**—This complex occurs on slopes of 5 to 12 percent. It consists of well-drained soils of the uplands. The Shubuta soil has developed in sandy clay Coastal Plain materials, the Ruston in sandy Coastal Plain materials, and the Silerton in a thin layer of loess that overlies sandy clay Coastal Plain materials. The soils are in the same general area as Shubuta-Ruston-Silerton soils, sloping phases. The natural vegetation was deciduous forest.

More than 75 percent of the original surface layer has been lost through erosion. In many places most of the subsoil has been washed away. The texture of the present plow layer is sandy clay in the Shubuta soil, clay loam in the Ruston, and heavy silt loam in the Silerton. The soils are mainly on slopes of 8 to 12 percent, but in some areas slopes of 5 to 8 percent predominate.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum of the Shubuta and Silerton soils is less permeable. The Ruston substratum is very permeable. Runoff on all of

the soils is rapid. Internal drainage is medium in the Shubuta and Silerton soils and rapid in the Ruston.

*Present use and management.*—All of this complex has been cropped, but most of it is now idle or in lespedeza pasture. A few areas are in bermudagrass or fescue and whiteclover. Row crops are not commonly rotated or fertilized, and yields are low. In most places there is not enough vegetation to check active erosion.

*Management requirements.*—Because of their droughtiness, low natural fertility, and severe erosion, the soils should be used only for permanent pasture or other permanent vegetation. In preparing the seedbed, tilling should be done on the contour. Lime and fertilizer are best applied according to needs indicated by soil tests. Care is necessary to protect the pastures from overgrazing.

These soils are suited to such hay and pasture plants as orchardgrass, bermudagrass, fescue, whiteclover, sericea lespedeza, and kudzu. If the soils are not needed for pasture, pine trees should be planted. The soils of this complex are in capability unit VIe-3.

**Shubuta-Ruston-Silerton soils, moderately steep phases (Sn).**—The soils of this complex occur on ridge slopes of more than 12 percent. They are well-drained soils of the uplands. The Shubuta soil has formed in sandy clay Coastal Plain materials, the Ruston in sandy Coastal Plain materials, and the Silerton in a thin layer (10 to 24 inches) of loess that overlies sandy clay Coastal Plain materials. The soils are in the same general area as Shubuta-Ruston-Silerton soils, sloping phases. Generally these soils on the steeper slopes have thinner, less developed profiles than soils on the milder slopes. The natural vegetation was deciduous forest.

Erosion losses range from very slight to moderate. The texture of the surface layer ranges from silt loam to fine sandy loam. Some soils on steep slopes are included.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum of the Shubuta and Silerton soils is less permeable. The substratum of the Ruston soil is highly permeable. Runoff on the three soils is rapid. Internal drainage is medium in the Shubuta and Silerton soils and rapid in the Ruston.

*Present use and management.*—About 90 percent of this complex is in forests of cutover hardwoods. The rest is cleared, and most of it is in pasture. Frequent burning and removal of salable timber from the forested areas have reduced the quality of the stand, but trees grow rapidly on these soils. Lespedeza is the principal pasture crop on the cleared areas. Some bermudagrass, fescue, and whiteclover are grown. If the soil is adequately fertilized, moderate yields are obtained. Generally, erosion is active where lespedeza is grown alone.

*Management requirements.*—These soils are so droughty, low in natural fertility, and erodible when cleared that they need to be kept in permanent vegetation. Forested areas should be protected from fire and cull trees replaced. In preparing the seedbed for pasture, tilling should be on the contour. The soils need frequent applications of lime and fertilizer. Soil tests will indicate the kinds and amounts of amendments to use.

These soils are suited to such pasture plants as fescue, kudzu, whiteclover, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. Cleared areas that are

not needed for pasture are best planted to pines. The soils of this complex are in capability unit VIe-3.

**Shubuta-Ruston-Silerton soils, severely eroded moderately steep phases (So).**—This complex consists of well-drained soils of the uplands. The soils occur on ridge slopes of more than 12 percent. The Shubuta soil has formed in sandy clay Coastal Plain materials and the Ruston in sandy Coastal Plain materials. The Silerton has formed in a thin layer (10 to 24 inches) of loess that overlies sandy clay Coastal Plain materials. The soils are in the same general area as Shubuta-Ruston-Silerton soils, sloping phases. Generally the profiles of the moderately steep soils are thinner and show less development than those of the soils on the milder slopes.

More than 75 percent of the original surface layer has been lost through erosion. In many places the subsoil and substratum are eroded. The texture of the present plow layer is heavy silt loam in the Silerton soil, clay loam in the Ruston, and sandy clay in the Shubuta. Although the dominant slopes are moderately steep, some slopes are steep.

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the substratum of the Shubuta and Silerton soils is less permeable. The substratum of the Ruston soil is highly permeable. Runoff is rapid on all of the soils. Internal drainage in the Silerton and Shubuta soils is medium, and in the Ruston it is rapid. A few areas of Cuthbert soils are included in this complex.

*Present use and management.*—All of this complex has been cropped or pastured. About 40 percent is now in pasture that consists of lespedeza, bermudagrass, fescue, or whiteclover, or some combination of these plants. The rest is idle or in wild pasture. Few pastures are adequately fertilized, and yields are low. In most areas erosion is active.

*Management requirements.*—The soils of this complex are all so droughty, low in natural fertility, severely eroded, and erodible that they are best suited to pine trees. Some areas can be used for pasture, provided the ground is well covered at all times. Lime and fertilizer must be applied frequently in kinds and amounts indicated by soil tests. The pastures will need protection from overgrazing.

The soils of this complex are suited to bermudagrass, sericea lespedeza, kudzu, fescue, and whiteclover. They are in capability unit VIe-3.

**Silerton silt loam, eroded gently sloping phase (Sp, Sr, and Sx).**—This well drained to moderately well drained soil of the uplands occurs on ridgetops that have slopes of 2 to 5 percent. The soil has developed in a thin layer (10 to 24 inches) of loess that overlies sandy clay or clay Coastal Plain materials. This soil is associated with Dulac, Tippah, Shubuta, Cuthbert, Ruston, and with other Silerton soils. It has formed under deciduous forest that consisted chiefly of oak, hickory, and beech.

Profile description:

- 0 to 4 inches, light yellowish-brown friable silt loam to strong-brown silty clay loam; weak fine crumb structure.
- 4 to 16 inches, strong-brown firm silty clay loam; moderate to strong medium blocky structure.
- 16 to 26 inches, brownish-yellow firm silty clay, faintly mottled with strong brown; moderate medium subangular blocky structure.
- 26 inches+, mottled strong-brown and olive very firm silty clay; micaceous; gradual transition to brittle sandy clay.

The colors of the material that underlies the loess are gray, yellow, red, and brown, but in most places the colors are variegated. The texture of this material ranges from sandy clay to clay.

From 25 to 75 percent of the original surface soil has been lost through erosion. In some areas, most of the surface soil has been removed. In places the subsoil is exposed. In a few spots there is a pan that is not clearly defined.

This soil is moderate to low in organic matter, in plant nutrients, and in water-supplying capacity. It is permeable. Runoff is medium, and internal drainage is medium to slow.

Mapped with this soil are small areas in which pans are forming. These areas are either so small or so intermingled with this soil that it was not feasible to map them separately.

*Present use and management.*—Some small inaccessible areas of this soil have not been cleared. Most of this soil is used for crops and pasture. Cotton, corn, and lespedeza are the principal crops. Fertilization is generally light, and yields are moderate to low.

*Management requirements.*—Although this soil is well suited to all of the crops commonly grown in the county, erosion is a hazard. The hazard can be reduced by using a good rotation in combination with other measures to control erosion. Some of these measures are cultivating on the contour, stripcropping, terracing, and using sodded waterways. The rotation should be 2 years or longer, and row crops should be grown not more than 2 years in succession. The organic matter and fertility can be increased and kept by growing green-manure or winter cover crops. The kind and amount of fertilizer are best determined by soil tests. Care must be taken not to overgraze the pastures.

In the severely eroded areas, row crops should not be grown more than once every 3 years. Crop residues and cover crops should be worked into the soil to build and maintain a higher level of fertility.

This soil is suited to cotton, corn, small grains, lespedeza, soybeans, cowpeas, and sorghum. It is also well suited to red, crimson, and white clovers, alfalfa, vetch, bermudagrass, orchardgrass, and fescue. It is in capability unit IIe-1.

**Silerton silt loam, sloping phase (St).**—This well-drained soil of the uplands occurs on ridgetop slopes of 5 to 8 percent. It has formed in a thin layer (10 to 24 inches) of loess that overlies sandy clay and clay Coastal Plain materials. This soil is associated with Shubuta, Cuthbert, Dulac, Ruston, and with other Silerton soils. It has formed under deciduous forest that was mainly oak.

Profile description:

- 0 to 7 inches, light yellowish-brown friable silt loam; weak medium subangular blocky structure.
- 7 to 24 inches, brown to dark-brown firm silty clay loam; moderate medium blocky structure.
- 24 inches+, yellowish-red firm silty clay, splotted with light gray.

This soil contains a moderate amount of organic matter and plant nutrients and has a moderate water-supplying capacity. It is a permeable soil. Except where a pan occurs, it is well drained. Runoff and internal drainage are medium. Included with this soil are areas in which there is a weak silt pan.

*Present use and management.*—Practically all of this soil occurs on narrow ridgetops. Consequently it is undesirable for cropping, and practically all of it is in trees, principally oak, hickory, and beech. The woods have been cut over and burned over frequently. The present stand consists largely of cull trees.

*Management requirements.*—This soil is suited to the crops commonly grown, but its position on ridgetops limits its use. If the soil must be cropped, a row crop should be grown only once every 3 years in a rotation that includes close-growing grasses and legumes. The need for lime and fertilizer is best determined by soil tests. Tilling on the contour, stripcropping, terracing, and using sodded waterways may be needed to control erosion. This soil is in capability unit IIIe-2.

**Silerton silt loam, eroded sloping phase (Su).**—This well-drained soil of the uplands has formed in a thin layer (10 to 24 inches) of loess that overlies sandy clay and clay Coastal Plain materials. It is associated with Dulac, Shubuta, Cuthbert, Ruston and with other Silerton soils.

Profile description:

- 0 to 5 inches, light yellowish-brown friable silt loam; weak medium subangular blocky structure.
- 5 to 22 inches, brown to dark-brown, firm silty clay loam; moderate medium blocky structure.
- 22 inches+, yellowish-red firm silty clay, spotted with light gray.

From 25 to 75 percent of the surface soil has been lost through erosion, but the texture has not been changed appreciably. The soil is moderate to low in organic matter and plant nutrients and has a moderate water-supplying capacity. In some small areas there is a weakly developed pan. Except in these small areas, the soil is well drained. This soil is permeable. Runoff and internal drainage are medium.

*Present use and management.*—All of this soil has been cleared. Most of it is in row crops or pasture. The principal crops are cotton, corn, and lespedeza, but the yields are moderate to low. Fertilization is generally light, but as a rule cotton receives some fertilizer.

*Management requirements.*—This soil is well suited to all of the commonly grown crops, but it is erodible. Row crops are best grown in a 3-year rotation that includes at least 2 years of grasses and legumes. The need for fertilizer is best determined by soil tests. In most places cultivating on the contour, terracing, and using sodded waterways are practices needed. This soil is in capability unit IIIe-2.

**Silerton silt loam, strongly sloping phase (Sv).**—This well-drained soil of the uplands occurs on ridgetops and on slopes of 8 to 12 percent. It has formed in a thin layer (10 to 24 inches) of loess that overlies sandy clay or clay Coastal Plain materials. It is associated with Dulac, Cuthbert, Shubuta, Ruston, and with other Silerton soils.

Profile description:

- 0 to 6 inches, light yellowish-brown friable silt loam; weak medium subangular blocky structure.
- 6 to 22 inches, brown to dark-brown, firm silty clay loam; moderate medium blocky structure.
- 22 inches+, yellowish-red firm silty clay spotted with light gray.

This soil generally has a thinner profile than soils on milder slopes. It has a moderate content of organic matter and plant nutrients and a moderate water-supplying capacity. This soil is permeable, and drainage

is generally good. Runoff is medium to rapid, and internal drainage is medium.

Some small areas in which there is a poorly developed pan are included with this soil. These areas are small and so intermingled that it was not feasible to separate them on a map of the scale used. They are not so well drained as the typical soil.

*Present use and management.*—Practically all of this soil is in hardwood forests that consist mainly of oak, hickory, and beech. The forests have all been cut over one or more times. Overgrazing and frequent burning have reduced the value of the present stand.

*Management requirements.*—This soil is suited to crops, but its position and strong slopes limit its use. It occurs in small areas on narrow, strongly sloping ridgetops. Unless needed in the cropping plan, it should remain in forest. The trees need to be protected from fire and to be thinned regularly. The areas may well be replanted to pines. If the soil is cleared, a rotation in which a row crop is used only once every 5 or 6 years is desirable. Such measures for controlling erosion as tilling on the contour, terracing, stripcropping, and using sodded waterways, may have to be used. The need for fertilizer is best determined by soil tests.

This soil is suited to cotton, corn, sorghum, cowpeas, fescue, whiteclover, orchardgrass, bermudagrass, sericea lespedeza, and other lespedezas. If the need for lime and fertilizer is met, alfalfa can be grown on selected sites. This soil is in capability unit IVe-2.

**Silerton silt loam, eroded strongly sloping phase (Sw).**—This well-drained soil of the uplands occurs on slopes of 8 to 12 percent. It has developed in a thin layer of loess that overlies sandy clay or clay Coastal Plain materials. The soil occurs in the same general area as Silerton silt loam, strongly sloping phase, and is similar to that soil except that 25 to 75 percent of the original surface soil has been lost through erosion.

This soil is moderately low in organic matter and plant nutrients and has a moderate water-supplying capacity. It is permeable. Runoff is medium to rapid, and internal drainage is medium. Included in this mapping unit are some small areas where there are pans that are not clearly defined. In these, the soils are intermingled with the typical soil but are not so well drained.

*Present use and management.*—Practically all of this soil is used for crops or pasture. Corn, cotton, and lespedeza are the principal crops, and yields are generally low. Except under cotton, where complete fertilizer is used, the soil is not generally fertilized.

*Management requirements.*—Its erodibility and location on strong slopes limit the use of this soil. It is best suited to close-growing hay crops and pasture. Row crops can be grown 1 year to 5 or 6 years of grasses and legumes. Terraces may be needed. If the soil is cultivated, all tillage should be on the contour and waterways left in sod. Fertilizer should be applied according to needs indicated by soil tests. Pastures need frequent applications of fertilizer and protection from overgrazing.

This soil is suited to cotton, corn, sorghum, and soybeans. It is also suited to small grains; fescue; orchardgrass; bermudagrass; kudzu; Ladino, white, and red clovers; and sericea and other lespedezas. If needs for lime and fertilizer are met, alfalfa will grow well on selected areas. This soil is in capability unit IVe-2.

**Silerton silty clay loam, severely eroded sloping phase (Sy).**—This well-drained soil of the uplands occurs on ridgetops that have slopes of 5 to 8 percent. It has developed in a thin layer of loess that overlies sandy clay and clay Coastal Plain materials. It is in the same general area and is associated with the same soils as Silerton silt loam, eroded sloping phase.

*Profile description:*

- 0 to 6 inches, brown friable silty clay loam; weak medium subangular blocky structure.
- 6 to 20 inches, brown to dark-brown, firm silty clay loam; moderate medium blocky structure.
- 20 inches+, yellowish-red silty clay, spotted with light gray.

Severe erosion has removed more than 75 percent of the original surface layer and, in places, part of the subsoil. Mixing of the remnants of the old surface soil and the subsoil has altered the texture. The texture of the present plow layer ranges from silty clay loam to silt loam.

This soil is low in organic matter and is moderately low in plant nutrients and in water-holding capacity. It is permeable. Runoff is medium. Internal drainage is medium except in areas where pans occur. In those places it is slow.

*Present use and management.*—All of this soil has been used for crops and pasture. Some is now idle or in unimproved pasture. Cotton, corn, and lespedeza are the principal crops, and yields are low. Intensive use for row crops has depleted the soil of plant nutrients and organic matter. Complete fertilizer is commonly used under cotton, but elsewhere fertilizer is not generally used.

*Management requirements.*—This soil is severely eroded and erodible, so it is best suited to close-growing hay and pasture crops. Row crops should be grown not more than 1 year to 5 or 6 years of grasses and legumes. If the soil is cultivated, tillage should be on the contour and waterways left in sod. The need for fertilizer is best determined by soil tests.

Pasture and hay plants to which this soil is suited are fescue; kudzu; orchardgrass; Ladino, white, and red clovers; and sericea lespedeza. If lime and fertilizer needs are met, alfalfa will grow well in some areas. Pastures need to be properly fertilized. They must not be overgrazed. Some row crops that can be grown are cotton, corn, and sorghum. This soil is in capability unit IVe-2.

**Silerton silty clay loam, severely eroded strongly sloping phase (Sz).**—This well-drained soil of the uplands occurs on ridgetops and slopes of 8 to 12 percent. It has developed in a thin layer (10 to 24 inches) of loess that overlies sandy clay or clay Coastal Plain materials. This soil is associated with Dulac, Tippah, Shubuta, Cuthbert, Ruston, and with other Silerton soils. It has developed under deciduous forest that consists mainly of oak, hickory, and beech.

*Profile description:*

- 0 to 6 inches, light yellowish-brown to brown friable silt loam and silty clay loam; weak medium subangular blocky structure.
- 6 to 20 inches, brown to dark-brown, firm silty clay loam; moderate medium blocky structure.
- 20 inches+, yellowish-red firm silty clay, spotted with light gray.

Severe erosion has removed 75 percent or more of the original surface soil. Except on small uneroded spots, the resulting plow layer has a heavier texture.

This soil is low in organic matter and plant nutrients and has a moderately low water-supplying capacity. It is permeable, but because it has a thinner profile than other Silerton soils, it tends to be droughty during the dry summer months. Runoff is rapid, and internal drainage is medium. This mapping unit includes small areas where pans are forming.

*Present use and management.*—All of this soil has been row cropped. About one-third is now in row crops, one-third is in hay or improved pasture, and one-third is idle or in wild pasture. The principal crops are cotton, corn, and lespedeza. Yields are generally low. Except for cotton, fertilizer is not commonly used.

*Management requirements.*—This soil is severely eroded and is erodible. Therefore, it should be in permanent pasture or other permanent vegetation. Except to prepare a seedbed, it should not be cultivated, and any tilling done should be on the contour. Fertilizer is best applied frequently in the kinds and amounts indicated by soil tests. During the summer the pastures need protection from overgrazing.

This soil is suited to such hay and pasture plants as orchardgrass, fescue, whiteclover, kudzu, and sericea lespedeza. If lime and fertilizer requirements are met, alfalfa can be grown on selected areas. If this soil is not needed for pasture, it would be well to plant it to pine trees. This soil is in capability unit VIe-2.

**Tippah silt loam, gently sloping shallow phase (Ta).**—This is a moderately well drained soil of the uplands that occurs on broad gently sloping ridgetops. It has developed in a thin layer (12 to 36 inches) of loess that overlies clay Coastal Plain materials. It is associated with Silerton, Dulac, Shubuta, and Cuthbert soils. Practically all of this soil is in the southeastern part of the county, just west of Sardis.

*Profile description:*

- 0 to 8 inches, light yellowish-brown friable silt loam; weak medium granular structure.
- 8 to 18 inches, strong-brown firm silty clay loam, spotted with pale brown; moderate medium blocky structure.
- 18 to 30 inches, (siltpan) gray firm silty clay, spotted with reddish yellow; medium angular blocky structure (buckshot).
- 30 inches+, yellowish-brown and olive very firm plastic clay.

Erosion has removed up to 75 percent of the original surface soil. Where the loess is thin, the siltpan is only slightly developed.

This soil is moderate to low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable down to the plastic clay, which is only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—About half of this soil is in crops or pasture, and the rest is in cutover forest. Cotton, corn, and lespedeza are the principal crops. Even in a normal season, corn usually is damaged by drought. Generally fertilizer is not used, and yields are low.

*Management requirements.*—This soil is productive when the content of organic matter is kept high by good selection of crops and liberal use of lime and fertilizer. Row crops can be grown as much as one-half of the time. They should not be grown more than 2 years in succession. It is best to follow the row crop with a cover crop. Cultivating should be done on the contour and waterways

left in sod. Terraces may be needed to help prevent erosion. Pastures need frequent application of fertilizer and protection from overgrazing. Soil tests will indicate the kinds and amounts of amendments needed.

This soil is suited to small grains, vetch, crimson clover, and such drought-resistant crops as cotton, soybeans, cowpeas, and sorghum. Many grasses and legumes, such as orchardgrass, bermudagrass, fescue, whiteclover, and lespedeza, can be grown for hay and pasture. This soil is in capability unit IIe-2.

**Tippah silt loam, severely eroded gently sloping shallow phase (Tb).**—This moderately well drained soil of the uplands has developed in a thin layer (12 to 36 inches) of loess that overlies acid plastic Coastal Plain clay. It occurs on ridgetops that have slopes of 2 to 5 percent. It is associated with Tippah silt loam, gently sloping shallow phase, and differs from it in having lost more than 75 percent of its surface soil through erosion.

**Profile description:**

- 0 to 6 inches, yellowish-brown friable silty clay loam; weak medium blocky structure.
- 6 to 14 inches, strong-brown silty clay loam; moderate medium blocky structure.
- 14 to 27 inches, (siltpan) gray firm silty clay, splotted with reddish yellow; medium angular blocky structure.
- 27 inches+, yellowish-brown and olive very firm plastic clay.

Where the loess is thin, the siltpan is only slightly developed.

This soil is low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the clay layer is only slightly permeable. Runoff is medium, and internal drainage is slow.

*Present use and management.*—All of this soil has been cropped, but about half is now idle or in wild pasture. Cotton, corn, and lespedeza are the principal crops, but the yields are generally low. During a normal season, corn is usually damaged by drought. A stand of alfalfa or kudzu is difficult to maintain. Complete fertilizer is commonly applied under cotton, but elsewhere fertilizer is not generally used.

*Management requirements.*—This soil is limited in use by being droughty and erodible. The amount of organic matter can be increased by adding manure, lime, and fertilizer and by turning under green-manure crops. Only 1 year of row crops should be grown to 2 years of close-growing grasses and legumes. It is well to follow the row crop with a winter cover crop. Care must be taken to prevent erosion. Some measures that will help are cultivating on the contour, leaving waterways in sod, terracing, and stripcropping.

This soil is suited to small grains, vetch, crimson clover, soybeans, sorghum, and cowpeas. Hay and pasture crops to which the soil is suited are orchardgrass, bermudagrass, fescue, whiteclover, sericea lespedeza, and annual lespedeza. This soil is in capability unit IIIe-1.

**Tippah silt loam, sloping shallow phase (Tc).**—This moderately well drained soil of the uplands occurs on slopes of 5 to 12 percent. It has developed in a thin layer (12 to 36 inches) of loess that overlies acid, plastic Coastal Plain clay. This soil is associated with Silerton, Dulac, Shubuta, Cuthbert, and other Tippah soils. Most of it is in the southeastern part of the county, west of Sardis.

**Profile description:**

- 0 to 8 inches, light yellowish-brown friable silt loam; weak medium granular structure.
- 8 to 16 inches, strong-brown firm silty clay loam, splotted with pale brown; moderate medium blocky structure.
- 16 to 28 inches, (siltpan) gray firm silty clay, splotted with reddish yellow; medium angular blocky structure.
- 28 inches+, yellowish-brown and olive very firm plastic clay.

Up to 75 percent of the surface soil has been lost through erosion. Generally where the loessal material is thin, the siltpan is correspondingly thin.

This soil is moderate to low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable, but the siltpan and clay below it are only slightly permeable. Runoff is medium to rapid, and internal drainage is slow. The soil is somewhat droughty.

*Present use and management.*—About half of this mapping unit is in forest. The rest is in crops, principally cotton, corn, and lespedeza. Fertilizers are not generally used, and yields are low.

*Management requirements.*—As this soil is somewhat droughty, crops such as corn that require a large amount of moisture will be damaged during a normal season. All crops need to be fertilized frequently. The kinds and amounts of amendments needed can be determined by soil tests. A higher level of organic matter and fertility can be obtained and kept by using liberal amounts of manure, lime, and fertilizer. Only 1 year of row crops should be grown to 2 to 5 years of close-growing grasses and legumes. Cultivating should be done on the contour. Terracing and the use of sodded waterways will generally be needed. Stripcropping may also be needed.

This soil is suited to small grains, vetch, crimson clover, and drought-resistant crops, as cotton, soybeans, and sorghum. Many grasses and legumes can be grown for pasture. Some of these are orchardgrass, bermudagrass, fescue, whiteclover, sericea lespedeza, and other lespedezas. Care must be taken not to graze pasture plants nearer than 2 inches to the ground. This soil is in capability unit IIIe-1.

**Tippah silt loam, severely eroded sloping shallow phase (Td).**—This moderately well drained upland soil occurs on slopes of 5 to 12 percent. It has developed in a thin layer (12 to 36 inches) of loess that overlies acid, plastic Coastal Plain clay. It is in the same general area as the other Tippah soils and is associated with them.

**Profile description:**

- 0 to 6 inches, yellowish-brown friable silty clay loam; weak medium blocky structure.
- 6 to 14 inches, strong-brown silty clay loam; moderate medium blocky structure.
- 14 to 26 inches, (siltpan) gray firm silty clay splotted with reddish yellow; medium angular blocky structure.
- 26 inches+, yellowish-brown and olive very firm plastic clay.

Erosion has been severe on this soil. At least 75 percent of the original plow layer has been lost. The texture of the present plow layer in some small less eroded spots is silt loam rather than silty clay loam.

This soil is low in organic matter, in plant nutrients, and in water-supplying capacity. The surface soil and subsoil are permeable down to the siltpan, or silty clay layer, which is only slightly permeable. Runoff is medium to rapid, and internal drainage is slow.

*Present use and management.*—All of this soil has been used for crops. About half is now idle or in wild pasture. Cotton, corn, and lespedeza are the principal crops. Fertilizers are not generally used, and yields are low.

*Management requirements.*—This severely eroded soil is subject to further erosion. The plant nutrients have been lost through erosion or exhausted by intensive row cropping. Consequently, this soil is best suited to permanent pasture or other permanent vegetation. On some of the milder slopes, row crops will grow well, provided a 6-year rotation is used and erosion is effectively controlled. Some of the measures to control erosion are proper fertilizing, terracing, using sodded waterways, stripcropping, and cultivating on the contour. Pastures need to have fertilizer added and the weeds clipped. They must not be overgrazed. The need for lime and fertilizer can be determined by soil tests.

Under good management this soil is suited to cotton, cowpeas, soybeans, sorghum, fescue, ryegrass, bermudagrass, whiteclover, and sericea and common lespedezas. It is in capability unit IVe-1.

## Management, yields, and capability

The first part of this section deals with general practices of good management. The second part discusses yields and gives estimated yields for each soil under ordinary management and under improved management. In the third part the nationwide system of capability classification is explained, the capability units composed of soils in Henderson County are then presented, and management of the soils of each unit is discussed.

### General Practices of Good Management

Many farmers now practice good soil management, and their yields are much higher than the average for the county. In general, these farmers do these things:<sup>4</sup>

1. Use a suitable cropping system.
2. Add lime, fertilizer, and manure as indicated by soil tests and field trials.
3. Prepare a good seedbed and use good tillage practices to aid in controlling weeds.
4. Farm on the contour and build terraces as needed to help control erosion on cultivated soils.
5. Provide adequate drainage.
6. Irrigate where practical.

The foregoing practices are a part of good management almost anywhere. These practices are discussed in more detail in the following pages.

*Crop rotation.*—On most soils the crop yields will be higher if crops are grown in a good rotation. A crop rotation is the growing of two or more different crops in a definite order or sequence.

Ordinarily, the combination of crops in a good rotation should include (1) a legume to add nitrogen; (2) a cultivated crop to aid in controlling weeds; (3) a deep-rooted crop to utilize nutrients in the subsoil and to maintain the permeability of the subsoil; and (4) sod or a close-growing crop to help maintain tilth, to provide regular additions of organic matter, and to help control runoff.

<sup>4</sup> TENNESSEE AGRICULTURAL EXPERIMENT STATION. SOIL MANAGEMENT FOR LAWRENCE COUNTY, TENNESSEE, FARMS ACCORDING TO THEIR SOIL RESOURCES. Bul. 222, 48 pp. 1951.

Some crops serve two or more of the foregoing purposes. This reduces the number of crops needed in the rotation. The sequence of crops should be such that the soil is covered as much of the year as feasible.

*Lime, fertilizer, and manure.*—Most of the soils of Henderson County need additional nitrogen, phosphorus, and potassium. Applications of commercial fertilizer will supply these elements. Barnyard manure and green manure will supply them too and will also increase the content of organic matter. The organic matter will increase the moisture-holding capacity of the soil and improve its tilth. Ground limestone will supply calcium. Requirements of the soils for good yields of individual crops can best be determined by soil tests and by field trials.

*Supplementary erosion control practices.*—To prevent accelerated erosion on some fields, contour farming, stripcropping, and terracing must be used and waterways kept under sod. A good rotation should be selected and manure added.

Contour farming consists of plowing, planting, and tilling across the slope rather than up and down hill. This practice fits in well with stripcropping or terracing.

Stripcropping consists of planting close-growing crops or sod crops in strips across the slope between strips of cultivated crops. The purpose of stripcropping is to check erosion on the long slopes.

On some sloping soils under intensive cultivation, contour farming does not control erosion adequately and terraces may be needed. The purpose of a terrace is to intercept runoff water and slow it down. More of the water will then be absorbed by the soil and the excess diverted to satisfactory outlets. Waterways must be built and sod established before terrace water drains into them. Terraces must be designed to suit their particular location. They must be properly maintained. A representative of the Soil Conservation Service or the county agent will furnish specific information on terracing.

*Drainage.*—Wet lands can ordinarily be drained by open ditches, bedding, and row arrangement. Tile drainage is normally more satisfactory, if the soils are suited, but it is more expensive.

*Irrigation.*—Where water is available, it is generally profitable to irrigate during dry spells. The Soil Conservation Service technician or county agent will supply specific information about irrigation.

### Estimated Yields

The soils of Henderson County are listed in table 4 to show the average acre yields of the principal crops that may be expected over a period of years under each of two levels of management. Pasture yields are estimated in number of days an acre will graze one animal unit without injury to the pasture.

The estimates for crops are based primarily on information received through interviews with farmers, the county agricultural agent, and others who have had experience in the agriculture of the county. The estimates are as accurate as can be made without detailed, lengthy investigations. They represent the relative productivity of the soils shown on the map. The yields are estimated on a county-wide basis and therefore do not apply directly to any particular farm or area of land.

TABLE 4.—Estimated average yields per acre of the principal crops under two levels of management

[Yields in columns A are those to be expected under common management, and yields in columns B under improved management. Dotted lines indicate the soil is poorly suited to the crop or insufficient data available for accurate estimate]

Soil	Corn		Cotton (lint)		Alfalfa		Oats		Lespedeza		Soybeans		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	Bu.	Lb.	Lb.	Tons	Tons	Bu.	Bu.	Tons	Tons	Bu.	Bu.	Cow- acre- days <sup>1</sup>	Cow- acre- days <sup>1</sup>
Almo silt loam.....	18	35					20	50	0.8	1.1	10	25	25	70
Beechy silt loam.....	20	40							.8	1.1	10	30	55	130
Beechy fine sandy loam.....	18	35							.8	1.1	10	28	50	120
Calloway silt loam:														
Gently sloping phase.....	22	42	400	600			30	60	.7	1.1	12	26	50	95
Eroded gently sloping phase.....	20	40	350	550			28	58	.6	1.1	12	26	40	75
Cuthbert-Silerton soils:														
Sloping phases.....	15	35	250	400	1.5	3.0	22	48	.6	1.1	10	20	40	75
Severely eroded sloping phases.....	12	30	200	375	1.5	3.0	20	44	.5	1.0	8	18	20	35
Strongly sloping phases.....							20	44	.5	1.0	8	16	35	70
Severely eroded strongly sloping phases.....							18	40	.4	.9			20	35
Moderately steep phases.....									.4	.9			35	70
Severely eroded moderately steep phases.....									.4	.8				
Dexter fine sandy loam:														
Eroded gently sloping phase.....	40	72	500	700	2.3	3.9	38	80	1.0	1.6	16	34	85	130
Eroded sloping phase.....	25	50	375	600	2.0	3.8	30	60	.7	1.2	13	27	80	125
Dexter fine sandy clay loam:														
Severely eroded gently sloping phase.....	25	60	375	600	2.0	3.8	34	68	.8	1.4	14	32	40	80
Severely eroded sloping phase.....	20	40	350	550	2.0	3.6	25	54	.6	1.1	11	22	25	50
Dexter silt loam:														
Eroded gently sloping phase.....	42	80	525	750	2.3	4.0	40	85	1.0	1.8	18	38	95	150
Sloping phase.....	30	55	375	600	2.0	3.9	32	60	.9	1.4	15	34	85	130
Dexter silty clay loam, severely eroded sloping phase.....	20	40	350	550	1.9	3.8	25	54	.7	1.1	12	24	30	55
Dulac silt loam:														
Eroded gently sloping deep phase.....	30	65	425	675			35	75	.8	1.3	15	30	50	90
Sloping deep phase.....	20	50	375	625			30	63	.7	1.2	12	24	50	90
Eroded sloping deep phase.....	19	48	365	615			23	50	.7	1.1	11	22	45	80
Strongly sloping deep phase.....	18	40	350	500			22	48	.6	1.0			40	80
Dulac silty clay loam:														
Severely eroded gently sloping deep phase.....	20	55	385	625			30	65	.7	1.2	14	26	25	60
Severely eroded sloping deep phase.....	18	45	350	600			25	55	.6	1.0	10	20	20	50
Severely eroded strongly sloping deep phase.....			300	475			18	40	.5	.9			15	45
Dulac-Cuthbert soils:														
Severely eroded strongly sloping phases.....							16	35	.5	.8			15	40
Moderately steep phases.....														
Dulac and Tippah silt loams:														
Gently sloping phases.....	32	65	435	635			35	75	.8	1.3	15	30	55	90
Eroded gently sloping phases.....	30	60	400	625			32	70	.7	1.2	14	28	50	80
Sloping phases.....	20	50	375	575			30	62	.7	1.1	12	24	50	80
Eroded sloping phases.....	18	48	350	550			28	58	.6	1.1	11	22	40	70
Dulac and Tippah silty clay loams:														
Severely eroded gently sloping phases.....	20	50	375	575			30	65	.7	1.1	13	26	30	60
Severely eroded sloping phases.....	15	40	325	535			25	55	.5	1.0	10	20	20	35
Severely eroded strongly sloping phases.....							18	40	.5	.9			20	35
Freeland fine sandy loam, eroded gently sloping phase.....	25	60	425	650			32	70	.8	1.3	14	28	60	115
Freeland fine sandy clay loam, severely eroded sloping phase.....	15	40	300	500			25	48	.5	1.0	10	20	20	40
Freeland silt loam:														
Eroded gently sloping phase.....	30	65	450	675			35	75	.8	1.3	15	30	65	120
Severely eroded gently sloping phase.....	20	55	400	635			30	60	.7	1.2	14	28	30	60
Eroded sloping phase.....	20	50	375	625			28	60	.5	1.1	14	28	60	100
Severely eroded sloping phase.....	15	40	325	550			25	48	.5	1.0	12	24	20	45
Severely eroded strongly sloping phase.....							20	45	.5	.9			20	45
Gullied land:														
Moderately gullied land:														
Cuthbert-Silerton materials.....														
Lexington-Ruston materials.....														
Severely gullied land:														
Cuthbert-Silerton materials.....														
Lexington-Ruston materials.....														
Hatchie silt loam, gently sloping phase.....	20	40	400	600			30	60	.6	1.2	14	28	45	90
Hymon fine sandy loam.....	40	75	525	725					1.0	1.7	22	40	70	135

See footnote at end of table.

TABLE 4.—Estimated average yields per acre of the principal crops under two levels of management—Continued

Soil	Corn		Cotton (lint)		Alfalfa		Oats		Lespedeza		Soybeans		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Hymon fine sandy loam, local alluvium phase	Bu. 42	Bu. 77	Lb. 525	Lb. 725	Tons 2.0	Tons 3.8	Bu. 42	Bu. 88	Tons 1.0	Tons 1.7	Bu. 22	Bu. 40	Cow- acre- days <sup>1</sup> 65	Cow- acre- days <sup>1</sup> 125
Hymon silt loam	45	85	550	750	2.0	4.0	45	90	1.0	1.8	22	40	90	160
Hymon silt loam, local alluvium phase	45	85	550	750	2.0	4.0	45	90	1.0	1.8	22	40	70	140
Ina fine sandy loam	30	60	525	700					.9	1.6	16	36	55	130
Ina fine sandy loam, local alluvium phase	35	60	525	700			35	80	.9	1.6	16	38	70	120
Ina loamy fine sand, local alluvium phase	20	45	400	600			30	75	.8	1.6	15	35	30	50
Ina silt loam	40	80	500	700					1.0	1.7	18	38	60	135
Ina silt loam, local alluvium phase	42	80	525	725			40	85	1.0	1.7	18	38	75	120
Lexington silt loam:														
Eroded gently sloping phase	40	80	500	725	2.3	4.0	40	85	1.0	1.8	18	38	70	130
Sloping phase	30	65	400	650	2.0	3.9	32	60	.9	1.6	15	34	65	130
Eroded sloping phase	25	55	350	625	2.0	3.8	30	55	.8	1.4	14	32	60	110
Lexington silty clay loam:														
Severely eroded gently sloping phase	30	65	400	650	2.0	3.9	35	70	.9	1.6	15	35	30	85
Severely eroded sloping phase	15	40	325	550	2.0	3.8	25	52	.7	1.1	12	24	25	55
Severely eroded strongly sloping phase					2.0	3.5	20	40	.6	1.0			25	55
Lexington-Ruston soils:														
Sloping phases	20	45	375	600	2.0	3.5	25	45	.7	1.1	12	20	35	100
Eroded sloping phases	18	40	350	575	2.0	3.4	22	42	.6	1.0	10	18	25	85
Severely eroded sloping phases	15	35	325	550	2.0	3.3	18	40	.5	1.0	8	16	20	50
Strongly sloping phases	15	35	325	525	2.0	3.3	18	40	.5	1.0			35	100
Severely eroded strongly sloping phases					2.0	3.1	14	32	.5	.8			20	50
Moderately steep phases							14	30	.5	.8				85
Severely eroded moderately steep phases									.5	.75				
Providence silt loam:														
Eroded gently sloping phase	30	65	425	675			35	75	.8	1.3	15	30	70	100
Severely eroded gently sloping phase	20	55	385	625			30	65	.7	1.2	14	28	25	60
Sloping phase	20	50	385	625			30	65	.7	1.2	14	28	70	100
Eroded sloping phase	18	48	375	615			28	58	.6	1.1	12	24	60	85
Severely eroded sloping phase	15	40	325	550			25	55	.5	1.1	10	20	15	40
Severely eroded strongly sloping phase							18	38	.5	.9			15	40
Ruston fine sandy loam:														
Sloping phase							25	50	.6	1.0	10	20	45	80
Moderately steep phase														
Steep phase														
Ruston sandy clay loam:														
Severely eroded sloping phase							15	35	.5	.85				
Severely eroded moderately steep phase														
Severely eroded steep phase														
Sandy alluvial land														
Shannon silt loam, local alluvium phase	50	90	575	775	3.0	4.0	50	95	1.0	1.9	25	42	120	180
Shubuta-Cuthbert loams:														
Moderately steep phases									.5	.9			30	75
Steep phases														
Shubuta-Cuthbert sandy clays:														
Severely eroded sloping phases	15	40	300	500	1.8	3.0	24	48	.6	1.0	10	20	20	60
Severely eroded moderately steep phases														
Shubuta-Cuthbert-Silerton soils:														
Sloping phases	20	45	325	525	1.8	3.0	25	50	.7	1.1	10	20	35	80
Severely eroded sloping phases	16	40	300	500	1.7	2.9	20	45	.5	.9	9	18	25	65
Moderately steep phases									.5	.9			30	75
Severely eroded moderately steep phases														
Shubuta-Ruston-Silerton soils:														
Sloping phases	18	42	325	525	1.8	3.0	25	50	.7	1.1	10	20	30	75
Severely eroded strongly sloping phases	12	38	285	450	1.7	2.9	20	40	.5	.9			25	60
Moderately steep phases														
Severely eroded moderately steep phases														
Silerton silt loam:														
Eroded gently sloping phase	32	65	465	675	2.0	3.8	36	76	.9	1.3	15	30	40	80
Sloping phase	24	55	425	650	2.0	3.8	30	65	.7	1.2	14	28	40	80
Eroded sloping phase	22	50	400	600	2.0	3.7	28	60	.7	1.2	13	27	30	75
Strongly sloping phase	15	40	350	500	1.8	3.6	26	54	.6	1.1	12	24	35	75
Eroded strongly sloping phase	14	38	325	475	1.7	3.6	24	52	.5	1.0	11	22	30	70
Silerton silty clay loam:														
Severely eroded sloping phase	15	40	350	500	1.8	3.6	26	54	.6	1.1	12	24	25	55
Severely eroded strongly sloping phase	12	35	300	450	1.7	3.5	22	48	.5	1.0	10	20	20	55

See footnote at end of table.

TABLE 4.—Estimated average yields per acre of the principal crops under two levels of management—Continued

Soil	Corn		Cotton (lint)		Alfalfa		Oats		Lespedeza		Soybeans		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Tippah silt loam:	<i>Bu.</i>	<i>Bu.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Tons</i>	<i>Tons</i>	<i>Bu.</i>	<i>Bu.</i>	<i>Tons</i>	<i>Tons</i>	<i>Bu.</i>	<i>Bu.</i>	<i>Cow-acre-days</i> <sup>1</sup>	<i>Cow-acre-days</i> <sup>1</sup>
Gently sloping shallow phase.....	28	50	425	650	-----	-----	32	65	0.8	1.2	14	28	50	85
Severely eroded gently sloping shallow phase.....	24	48	400	600	-----	-----	30	60	.75	1.1	12	24	45	75
Sloping shallow phase.....	24	48	400	575	-----	-----	30	60	.75	1.1	12	24	45	75
Severely eroded sloping shallow phase.....	15	40	335	500	-----	-----	24	48	.6	1.0	10	20	30	65

<sup>1</sup> Cow-acre-days is a term used to express the number of days 1 acre will support 1 animal unit (1 cow, steer, or horse; or 5 hogs; or 7 sheep or goats) without injury to pasture.

In columns A of table 4 are estimated average acre yields under common management. Under this management no definite crop rotation is used, fertilizers are not generally applied except for cotton, and drainage is not provided for some of the soils that are too wet.

In columns B of table 4 are estimated average acre yields under improved management. At this level of management, crops are rotated and are chosen carefully; the proper amounts of commercial fertilizer, lime, and manure are used; tillage is done properly; organic matter is returned to the soil; and mechanical means are used to control excess water.

The management practices for improved management are more fully discussed in the section, Capability Grouping of Soils. In that section the soils that require about the same kind of management to offset their limitations are placed in capability units, and suitable methods of management are described for each unit.

By comparing yields in columns A and B in table 4, the response of a soil to improved management can be judged. The yields under improved management (columns B) do not define the maximum possible production on the various soils but may be used as production goals that can be attained by using management practices now feasible. They are believed to be yields that most farmers will find practical to reach if they choose to apply the practices suggested. Improved management will bring profitable increases in the yields of crops on most of the soils of the county.

### Capability Grouping of Soils

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

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

The next broader grouping, the subclass, is used to indicate the dominant kind of limitation. The letter

symbol "e" indicates that the main limiting factor is risk of erosion if the plant cover is not maintained; "w" means excess water that retards plant growth or interferes with cultivation; and "s" shows that the soils are shallow, droughty, or unusually low in fertility.

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

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

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

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

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

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

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

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

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

In class VIII are soils that have practically no agricultural use.

In Henderson County there are no soils in classes I, V, and VIII.

The soils of Henderson County are in the following classes, subclasses, and units:

Class II.—Soils moderately limited for use as cropland.

Subclass IIe.—Soils subject to moderate erosion.

Unit:

IIe-1.—Moderately well drained to well drained terrace, upland, and second-bottom soils.

IIe-2.—Moderately well drained soils of the terraces, uplands, and second bottoms that have a siltpan, a fine sandy clay layer, or a brittle compact layer.

Subclass IIw.—Soils moderately limited by excess water.

Unit:

IIw-1.—Nearly level soils of the bottom lands.

Class III.—Soils severely limited for use as cropland but suitable for regular cropping systems.

Subclass IIIe.—Gently sloping to sloping soils where erosion is the most outstanding source of risk to sustained use under cultivation.

Unit:

IIIe-1.—Moderately well drained upland and second-bottom soils that have a fine clay layer or a brittle compact layer.

IIIe-2.—Well-drained upland and second-bottom soils.

IIIe-3.—Somewhat poorly drained siltpan soils of the uplands.

Subclass IIIw.—Soils limited by excess water.

Unit:

IIIw-1.—Somewhat poorly drained pan soils of the uplands and second bottoms.

IIIw-2.—Nearly level somewhat poorly drained soils of the bottom lands.

Class IV.—Soils very severely limited for use as cropland, suitable for cultivation part of the time or for special crops.

Subclass IVe.—Soils subject to severe erosion.

Unit:

IVe-1.—Moderately well drained sloping or strongly sloping soils, on uplands and second bottoms, that have a fine clay layer or a brittle compact layer.

IVe-2.—Well-drained sloping and strongly sloping soils of the uplands.

IVe-3.—Sloping or strongly sloping soil complexes.

Subclass IVw.—Soils limited by excess water.

Unit:

IVw-1.—Nearly level, poorly drained bottom and second-bottom soils.

Class VI.—Soils ordinarily not suited to tilled crops and with moderately severe limitations for pasture and trees.

Subclass VIe.—Severely eroded soils.

Unit:

VIe-1.—Moderately well drained, severely eroded, strongly sloping pan soils.

VIe-2.—Well-drained, severely eroded, strongly sloping and moderately steep soils.

VIe-3.—Severely eroded sloping, strongly sloping, and moderately steep soil complexes that have a substratum of heavy sandy clay.

Class VII.—Soils that are not suited to tilled crops and that have severe limitations for pasture or trees.

Subclass VIIe.—Eroded soils.

Unit:

VIIe-1.—Gullied land, sloping to steep, and moderately to severely eroded.

VIIe-2.—Slightly or severely eroded soils on steep slopes.

#### CAPABILITY UNIT IIe-1

*Moderately well drained to well drained soils of the terraces, uplands, and second bottoms:*

Dexter fine sandy loam, eroded gently sloping phase (Dd).  
Dexter silt loam, eroded gently sloping phase (Dg and Dk).  
Lexington silt loam, eroded gently sloping phase (La).  
Silterton silt loam, eroded gently sloping phase (Sp, Sr, and Sx).

This group consists of brown, moderately well drained to well drained soils. They occur on mild slopes on terraces, uplands, and second bottoms. The soils are only slightly to moderately eroded. They are generally productive and easy to work but are somewhat difficult to conserve. Their moisture-holding capacity is moderately high. Water moves through these soils at a moderate rate, and in normal seasons moisture conditions are favorable for plant growth.

These soils are suited to all the crops commonly grown in the county. Some of these are cotton, corn, soybeans, small grains, and truck crops. The soils are also suited to orchardgrass; fescue; alfalfa; red, crimson, and white clovers; lespedeza; and other grasses and legumes grown for hay.

Cultivated crops can be grown in short rotations with grasses and legumes. Do not use row crops for more than 2 years in succession. Use contour farming, terraces, and sodded waterways as needed to control erosion. The soils need green-manure crops to supply fresh organic matter. They respond well to amendments. Apply lime and fertilizer in kinds and amounts indicated by soil tests and field trials.

#### CAPABILITY UNIT IIe-2

*Moderately well drained soils of the terraces, uplands, and second bottoms that have a siltpan, a fine sandy clay layer, or a brittle compact layer:*

Dulac silt loam, eroded gently sloping deep phase (Dn).  
Dulac and Tippah silt loams, gently sloping phases (Dz).  
Dulac and Tippah silt loams, eroded gently sloping phases (Dla).  
Freeland fine sandy loam, eroded gently sloping phase (Fa and Fc).  
Freeland silt loam, eroded gently sloping phase (Fe).  
Providence silt loam, eroded gently sloping phase (Pa).  
Tippah silt loam, gently sloping shallow phase (Ta).

These soils occur on gentle slopes and are only slightly or moderately eroded. Their subsoils are underlain by a siltpan or by heavy clay. The pan or clay layer is only slightly permeable. Root growth is restricted by it, and water moves slowly through this soil. The soils are acid and are moderate to low in organic matter, in plant nutrients, and in water-holding capacity. They are wet and cold during early spring and slightly droughty during a normal summer. Drought usually damages corn.

The soils are suited to such drought-resistant crops as cotton, soybeans, and sorghum. They are also suited to

small grains, vetch, crimson clover, white clover, orchardgrass, bermudagrass, fescue, and lespedeza. Even under the best management, it is hard to maintain a stand of alfalfa or kudzu.

It is necessary to keep the content of organic matter high by selecting crops carefully and using manure, lime, and fertilizer liberally. Soil tests will indicate the kinds and amounts of fertilizer needed. Grow row crops no more than half the time and no oftener than 2 years in succession. Follow them with a cover crop. Farm on the contour, and leave waterways in sod. In areas where they are needed, use terraces to help prevent erosion.

**CAPABILITY UNIT IIw-1**

*Nearly level soils of the bottom lands:*

- Hymon fine sandy loam (Hb).
- Hymon fine sandy loam, local alluvium phase (Hc).
- Hymon silt loam (Hd).
- Hymon silt loam, local alluvium phase (He).
- Shannon silt loam, local alluvium phase (Sa).

The Hymon soils are moderately well drained, and the Shannon soil is well drained. The soils are occasionally flooded by streams or by runoff from higher lying areas. The local alluvium phases of these soils are less subject to flooding than the other soils. This group consists of soils that are productive and easily worked. Most have a moderate amount of organic matter and plant nutrients. The soils are acid. Their water-holding capacity is moderate to high.

These soils are suited to cotton, corn, soybeans, truck crops, and to most of the crops commonly grown in the county. They produce good-quality hay and pasture plants, such as fescue, orchardgrass, bermudagrass, white-clover, and lespedeza. Alfalfa is not generally grown because of imperfect drainage and risk of overflow.

If properly drained and managed, these soils are suited to continuous row cropping. Where suitable outlets are available, adequate drainage can be obtained by using open ditches, row arrangement, and, in some places, tile or diversion ditches. If the soils are not drained, planting dates are late some years because the soils are saturated.

Plant a winter green-manure crop after row crops where the soils are not subject to overflow. Where flooding has killed the winter cover crop, turn under a summer legume to help maintain the content of organic matter. The soils respond well to fertilizer. Apply fertilizer in kinds and amounts indicated by soil tests.

**CAPABILITY UNIT IIIe-1**

*Moderately well drained upland and second-bottom soils that have a fine clay layer or a brittle compact layer:*

- Dulac silt loam, sloping deep phase (Do).
- Dulac silt loam, eroded sloping deep phase (Dp).
- Dulac silty clay loam, severely eroded gently sloping deep phase (Ds).
- Dulac and Tippah silt loams, sloping phases (Dlb).
- Dulac and Tippah silt loams, eroded sloping phases (Dlc).
- Dulac and Tippah silty clay loams, severely eroded gently sloping phases (Dlf).
- Freeland silt loam, severely eroded gently sloping phase (Ff).
- Freeland silt loam, eroded sloping phase (Fg).
- Providence silt loam, severely eroded gently sloping phase (Pb).
- Providence silt loam, sloping phase (Pc).
- Providence silt loam, eroded sloping phase (Pd).
- Tippah silt loam, severely eroded gently sloping shallow phase (Tb).
- Tippah silt loam, sloping shallow phase (Tc).

These soils occur on severely eroded gently sloping areas or on slightly to moderately eroded sloping areas. Except where the subsoil has been exposed by erosion, they are easily cultivated. The subsoil is underlain by a pan layer or by heavy clay. Water moves through the surface layer and subsoil at a moderate rate but moves slowly through the pan, or layer of heavy clay. This causes the soils to be wet and cold during early spring and slightly droughty during a normal summer. Erosion is particularly damaging to these soils because of the limited zone in which roots can grow. The soils are moderately low to low in organic matter and plant nutrients. They are acid.

The soils of this group are suited to small grains, vetch, and crimson clover, and to drought-resistant crops such as cotton, soybeans, and sorghum. Orchardgrass, bermudagrass, whiteclover, fescue, sericea and common lespedezas, and other grasses and legumes can be grown for hay or pasture. Drought usually damages corn. Yields of alfalfa and kudzu are low, and a stand is hard to maintain.

Keep the organic matter as high as possible by using green-manure crops. Apply lime and fertilizer liberally in kinds and amounts indicated by soil tests. Plant a winter cover crop after row crops, and grow grasses and legumes for 2 years after each year of row crops. To prevent erosion, use strip cropping or terraces where needed. Cultivate on the contour, and leave waterways in sod.

**CAPABILITY UNIT IIIe-2**

*Well-drained soils of the uplands and second bottoms:*

- Dexter fine sandy loam, eroded sloping phase (De and Df).
- Dexter fine sandy clay loam, severely eroded gently sloping phase (Da).
- Dexter silt loam, sloping phase (Dh).
- Lexington-Ruston soils, sloping phases (Lk).
- Lexington-Ruston soils, eroded sloping phases (Lm).
- Lexington silt loam, sloping phase (Lb).
- Lexington silt loam, eroded sloping phase (Lc).
- Lexington silty clay loam, severely eroded gently sloping phase (Lf).
- Ruston fine sandy loam, sloping phase (Ra).
- Silerton silt loam, sloping phase (St).
- Silerton silt loam, eroded sloping phase (Su).

These soils are easily worked and are highly erodible. They are acid. Except in the Ruston soils, where water movement is rapid, the rate of water movement in the root zone is favorable for plants. The water-holding capacity is fairly high.

These soils are well suited to cotton, corn, soybeans, sorghum, kudzu, small grains, fescue, whiteclover, orchardgrass, and sericea and annual lespedezas. Alfalfa and red clover can be grown but need heavy applications of fertilizer.

The best rotation consists of 1 year of row crops to 2 years of close-growing crops. Use contouring, terracing, and sodded waterways as needed. Work cover crops and crop residues into the soil to maintain or increase the amount of organic matter. Apply lime and fertilizer in kinds and amounts indicated by soil tests.

**CAPABILITY UNIT IIIe-3**

*Somewhat poorly drained siltpan soils of the uplands:*

Only one soil—Calloway silt loam, eroded gently sloping phase (Cb)—is in this unit. This soil is wet during the winter and until late in spring. During the summer it is

droughty. Water moves through the surface soil and subsoil at a moderate rate. It moves slowly through the siltpan, which is at depths of 14 to 24 inches. The subsoil is yellowish-brown silty clay loam. The soil is acid and low in natural fertility. It is low in organic matter, in plant nutrients, and in water-supplying capacity.

This soil is suited to fescue, whiteclover, and bermudagrass, and especially to small grains and vetch. It is also suited to sorghum and to a less extent to cotton and corn.

If row crops are to be grown, use proper conservation practices such as cultivating on the contour, terracing, rotating crops, and using sodded waterways. Grow grasses and legumes about 3 years to each year of row crops. Apply lime and fertilizer heavily according to needs indicated by soil tests and field trials.

#### CAPABILITY UNIT IIIw-1

*Somewhat poorly drained pan soils of the uplands and second bottoms:*

- Calloway silt loam, gently sloping phase (Ca).
- Hatchie silt loam, gently sloping phase (Ha).

These soils are acid. They are low in organic matter, in plant nutrients, and in water-supplying capacity.

The soils are suited to small grains, soybeans, and sorghum, and to a less extent to cotton and corn. They are also suited to fescue, whiteclover, bermudagrass, and lespedeza.

These soils need artificial drainage. Use open ditches, bedding, row arrangement, and diversions. Apply lime and fertilizer according to needs indicated by soil tests and field trials.

#### CAPABILITY UNIT IIIw-2

*Nearly level somewhat poorly drained soils of the bottom lands:*

- Ina fine sandy loam (1a).
- Ina fine sandy loam, local alluvium phase (1b).
- Ina loamy fine sand, local alluvium phase (1c).
- Ina silt loam (1d).
- Ina silt loam, local alluvium phase (1e).

These soils have little or no erosion. They have a gray subsoil and a brown surface soil, which is generally easy to work. Most of the soils are frequently flooded and have a fairly high water table. Crops sometimes drown out in wet seasons, especially those in low-lying areas. The soils are wet and cold during early spring. Planting dates are later than for the better drained bottom soils. Sand blows occasionally, and small sandy spots are fairly common. The soils are acid. Most have a moderate supply of organic matter and plant nutrients.

If properly drained these soils are suitable for corn, soybeans, and sorghum. Cotton would have to be planted late in wet years and consequently would mature late. The soils are well suited to hay and pasture plants such as fescue, whiteclover, lespedeza, and bermudagrass.

If properly drained and managed, these soils can be cropped continuously. Where outlets are available, use bedding, open ditches, and row arrangement. To protect the soils from flooding, build levees where possible. Use diversion ditches, if needed, to intercept runoff from nearby slopes. Where flooding is not a hazard, follow

row crops with winter green-manure crops. Apply lime and fertilizer according to needs indicated by soil tests and field trials.

#### CAPABILITY UNIT IVe-1

*Moderately well drained sloping or strongly sloping soils, on uplands and second bottoms, that have a fine clay layer or a brittle compact layer:*

- Dulac silt loam, strongly sloping deep phase (Dr).
- Dulac silty clay loam, severely eroded sloping deep phase (Dt.)
- Dulac silty clay loam, severely eroded strongly sloping deep phase (Du).
- Dulac and Tippah silty clay loams, severely eroded sloping phases (Dtg).
- Freeland fine sandy clay loam, severely eroded sloping phase (Fb and Fd).
- Freeland silt loam, severely eroded sloping phase (Fh).
- Providence silt loam, severely eroded sloping phase (Pe).
- Providence silt loam, severely eroded strongly sloping phase (Pf).
- Tippah silt loam, severely eroded sloping shallow phase (Td).

The soils of this unit are fairly easy to cultivate, even where they are severely eroded. Their subsoil is underlain by a pan, or heavy clay layer. Water moves at a moderate rate through the surface soil and subsoil but moves slowly through the pan or heavy clay. This layer restricts root growth and causes the soils to be wet and cold early in spring and slightly droughty during summer. The soils are especially susceptible to erosion. They are low in plant nutrients and organic matter. Most are strongly acid.

These soils are best suited to hay and pasture, but they can be cultivated occasionally. They are suited to fescue, small grains, vetch, orchardgrass, bermudagrass, white and crimson clovers, and sericea and annual lespedezas. They are also suited to cotton, soybeans, sorghum, and other drought-resistant crops. In a normal season, drought usually damages corn. Yields of alfalfa and kudzu are moderately low, and it is difficult to maintain a stand.

Ordinarily, these soils should not be cultivated more than once every 6 years. If row crops are grown, cultivate on the contour and leave waterways in sod. Use terraces and stripcropping to help prevent erosion. Large amounts of lime and fertilizer are generally needed. Apply according to needs indicated by soil tests and field trials.

#### CAPABILITY UNIT IVe-2

*Well-drained sloping and strongly sloping soils of the uplands:*

- Dexter fine sandy clay loam, severely eroded sloping phase (Db and Dc).
- Dexter silty clay loam, severely eroded sloping phase (Dl and Dm).
- Lexington silty clay loam, severely eroded sloping phase (Lg).
- Lexington-Ruston soils, severely eroded sloping phases (Ln).
- Lexington-Ruston soils, strongly sloping phases (Lo and Lp).
- Ruston sandy clay loam, severely eroded sloping phase (Re).
- Silerton silt loam, strongly sloping phase (Sv).
- Silerton silt loam, eroded strongly sloping phase (Sw).
- Silerton silty clay loam, severely eroded sloping phase (Sy).

This unit consists of predominantly yellowish brown soils that have a silty or sandy surface layer that erodes readily when the soils are cleared. The eroded soils are droughty, and on them runoff is more rapid than on the uneroded soils. Most of the soils of this unit are in the

uplands. The soils are acid. Most are low in organic matter, in plant nutrients, and in water-holding capacity.

This unit is best suited to hay and pasture plants. Some of these plants are fescue, kudzu, white clover, red clover, sericea lespedeza, and common lespedeza. The soils are also suited to alfalfa, if lime and fertilizer are applied in adequate amounts.

Row crops can be grown, but do not use them for more than 1 year to 5 or 6 years of grasses and legumes. Cultivate on the contour, and leave waterways in sod. Use terraces where needed. Apply lime and fertilizer according to need as indicated by soil tests.

**CAPABILITY UNIT IVe-3**

*Sloping or strongly sloping soil complexes:*

- Cuthbert-Silerton soils, sloping phases (Cc).
- Cuthbert-Silerton soils, strongly sloping phases (Ce).
- Shubuta-Cuthbert sandy clays, severely eroded sloping phases (Sd).
- Shubuta-Cuthbert-Silerton soils, sloping phases (Sf).
- Shubuta-Cuthbert-Silerton soils, severely eroded sloping phases (Sg).
- Shubuta-Ruston-Silerton soils, sloping phases (Sl).

This unit consists of complexes of soils that vary greatly in depth, in color, and in soil material. The soils are slightly to severely eroded. They are droughty, and most are moderately low to low in natural fertility. Generally, water moves slowly through the soils, and root growth is restricted.

These soils are best suited to hay and pasture crops, as fescue, orchardgrass, bermudagrass, whiteclover, sericea lespedeza, and annual lespedeza. Such crops as cotton, peas, soybeans, and small grains can be grown, but yields are usually low. If sites are carefully selected, alfalfa and kudzu can be grown.

Do not grow row crops more than 1 year to 5 or 6 years of grasses and legumes. Cultivate on the contour, and use terraces, sodded waterways, or stripcropping where needed. Apply lime and fertilizer according to needs indicated by soil tests.

**CAPABILITY UNIT IVw-1**

*Nearly level, poorly drained bottom and second-bottom soils:*

- Almo silt loam (Aa).
- Beechy silt loam (Bb).
- Beechy fine sandy loam (Ba).
- Sandy alluvial land (Rk).

On the bottom lands, flooding is frequent, but on the second bottoms and local alluvial lands, it occurs less often. During a normal season, the soils do not dry out nor warm up until late in spring or early in summer. In some years the soils in low areas do not dry out all summer. On the other hand, Almo silt loam and Sandy alluvial land are often very droughty during the summer. Locally, areas of these soils are known as "white," "wet," "cold," or "buckshot land." Beechy silt loam is moderately high in organic matter and plant nutrients; the other mapping units are generally low. All are strongly acid.

If these soils are adequately drained, they are suited to fescue, bermuda grass, white clover, alsike clover, and lespedeza. Soybeans, sorghum, corn, and some cotton are grown, but yields are poor. Many areas are now wooded and are best left in trees.

Generally, the soils cannot be adequately drained be-

cause outlets are not available. Where outlets are available, improve the drainage by using bedding, open ditches, and row arrangement. Use diversion ditches, where needed, to intercept runoff from nearby slopes. If satisfactory drainage is established and maintained, these soils can be used for row crops. Where overflow is not damaging, grow winter green-manure crops. All crops respond well to fertilizer, so determine their needs from soil tests.

**CAPABILITY UNIT VIe-1**

*Moderately well drained, severely eroded, strongly sloping pan soils:*

- Dulac and Tippah silty clay loams, severely eroded strongly sloping phases (Dld, Dle, and Dlh).
- Freeland silt loam, severely eroded strongly sloping phase (Fk).

This unit consists of two moderately well drained siltpan soils. One occurs in the uplands, and the other is on old terraces. Water moves at a moderate rate through the surface soil and subsoil but moves very slowly through the pan. The soils are acid, droughty, and low in natural fertility.

These soils are best used for permanent vegetation. They are suited to such hay and pasture plants as fescue, bermudagrass, sericea lespedeza, and annual lespedeza. Do not cultivate except to prepare a seedbed. So that the entire slope will not be bare, reseed in alternate strips and cultivate on the contour. Avoid overgrazing, and apply lime and fertilizer frequently. Soil tests will indicate the kind and amount of fertilizer needed. If the soils are not needed for pasture, plant to pines or other trees.

**CAPABILITY UNIT VIe-2**

*Well-drained, severely eroded, strongly sloping and moderately steep soils:*

- Lexington-Ruston soils, severely eroded strongly sloping phases (Lr):
- Lexington-Ruston soils, moderately steep phases (Ls).
- Lexington-Ruston soils, severely eroded moderately steep phases (Lt).
- Lexington silty clay loam, severely eroded strongly sloping phase (Ld, Le, and Lh).
- Ruston fine sandy loam, moderately steep phase (Rb and Rc).
- Ruston sandy clay loam, severely eroded moderately steep phase (Rf and Rg).
- Silerton silty clay loam, severely eroded strongly sloping phase (Sz).

This unit is made up of brownish, well drained to excessively drained soils. They occur in the uplands. Small areas of Ruston soils on steep slopes are included in this unit, which is otherwise composed of strongly sloping and moderately steep soils. These mapping units erode readily and are droughty. They are acid. All are low in organic matter and plant nutrients, and most are low in water-holding capacity.

The soils are suited to fescue, kudzu, whiteclover, bermudagrass, and sericea lespedeza. In some places alfalfa will grow well under good management.

Leave the soils in trees or establish permanent pastures. Do not plow or disk except to prepare a seedbed. Where slopes are long, reestablish pasture in alternating strips so that only half the area will be bare at one time. Till on the contour. Avoid overgrazing, and apply lime and fertilizer frequently. Soil tests will indicate the kinds and amounts of amendments needed.

## CAPABILITY UNIT VIc-3

*Severely eroded sloping, strongly sloping, and moderately steep soil complexes that have a substratum of heavy sandy clay:*

- Cuthbert-Silerton soils, severely eroded sloping phases (Cd).
- Cuthbert-Silerton soils, severely eroded strongly sloping phases (Cf).
- Cuthbert-Silerton soils, moderately steep phases (Cg and Ck).
- Cuthbert-Silerton soils, severely eroded moderately steep phases (Ch and Cl).
- Dulac-Cuthbert soils, severely eroded strongly sloping phases (Dv and Dw).
- Dulac-Cuthbert soils, moderately steep phases (Dx and Dy).
- Shubuta-Cuthbert loams, moderately steep phases (Sb).
- Shubuta-Cuthbert sandy clays, severely eroded moderately steep phases (Se).
- Shubuta-Cuthbert-Silerton soils, moderately steep phases (Sh).
- Shubuta-Cuthbert-Silerton soils, severely eroded moderately steep phases (Sk).
- Shubuta-Ruston-Silerton soils, severely eroded strongly sloping phases (Sm).
- Shubuta-Ruston-Silerton soils, moderately steep phases (Sn).
- Shubuta-Ruston-Silerton soils, severely eroded moderately steep phases (So).

The soils of this unit vary in color, depth, and soil material. In many areas, erosion has exposed the substratum of heavy sandy clay. The heavy texture slows movement of water and restricts root growth. This and rapid runoff cause the soils to be droughty. All are acid. Most are low in organic matter, in plant nutrients, and in water-supplying capacity.

These complexes are suited only to hay and pasture or other permanent vegetation. They are suited to fescue, whiteclover, and sericea lespedeza.

Do not plow or disk except to prepare a seedbed. Apply lime and fertilizer in kinds and amounts indicated by soil tests. Avoid overgrazing. If the soils are not needed for pasture, plant the cleared areas to pines. Leave forested areas in trees, and protect from fire. Remove cull trees and replace them with healthy ones.

## CAPABILITY UNIT VIIe-1

*Gullied land, sloping to steep, and moderately to severely eroded:*

- Moderately gullied land, Cuthbert-Silerton materials (Ga).
- Moderately gullied land, Lexington-Ruston materials (Gc).
- Severely gullied land, Cuthbert-Silerton materials (Gb).
- Severely gullied land, Lexington-Ruston materials (Gd).

From 10 to 70 percent of the surface of the moderately gullied areas is gullied. In the severely gullied areas, more than 70 percent of the surface is covered by gullies. The exposed material in the gullies is sand, clay, sandy clay, or sandy clay loam. Large amounts of sand and silt wash from the gullies to the adjacent flood plains and stream channels.

This land is best suited to forests. Pine trees grow well. Some areas between gullies can be used for pasture plants such as kudzu, bermudagrass, and sericea lespedeza.

If these areas are used for pasture, protect the trees in the gullies from damage by livestock. Keep the ground covered at all times and apply lime and fertilizer heavily according to needs indicated by soil tests.

## CAPABILITY UNIT VIIe-2

*Slightly or severely eroded soils on steep slopes:*

- Ruston fine sandy loam, steep phase (Rd).
- Ruston sandy clay loam, severely eroded steep phase (Rh).
- Shubuta-Cuthbert loams, steep phases (Sc).

The soils of this unit are moderately well drained to somewhat excessively drained. They are droughty if cleared and are subject to further severe erosion. They are strongly acid and are moderately low to low in organic matter, in plant nutrients, and in water-supplying capacity.

These soils are suited to permanent vegetation, preferably trees. Pines grow well. Some areas are suited to grasses and legumes such as fescue, kudzu, bermudagrass, and sericea lespedeza.

Leave forested areas in trees, and protect them from fire. Replace cull trees with healthy ones. Keep a protective ground cover on cleared areas at all times. Do not overgraze. Apply lime and fertilizer according to needs indicated by soil tests.

## Forests

When the first white settlers arrived, the area that is now Henderson County was covered by dense hardwood forests. White oak, chestnut, hickory, poplar, beech, sweetgum, and blackgum were the principal species. Other trees were blackjack, black, scarlet, pin, and willow oaks; hackberry; yellow-poplar; wild cherry; dogwood; persimmon; red maple; redcedar; holly; ash; sycamore; and black walnut.<sup>5</sup>

Gradually, a large part of the soils suitable for cultivation was cleared. Generally, these were the soils on ridgetops, terrace lands, and bottom lands. The less productive soils were left in forest. Most of the forests have been cut over one or more times, and there are practically no virgin forests left. Many eroded areas have been planted to loblolly and shortleaf pines. Where seed trees abound, abandoned fields have been taken over by a natural stand of pines.

*Types of forest cover.*—Forests are generally of five types in Henderson County. The Ina-Beechy-Hymon soil association areas are dominated by an oak-beech-ash-gum-poplar type of hardwood forest. The Ruston-Lexington and Lexington-Ruston soil association areas are dominated by an oak-hickory-poplar type of hardwood forest. Trees on these areas grow fast, and stands are healthy if they are not overgrazed or damaged by fire. The Shubuta-Cuthbert association area is dominated by a white oak-hickory-beech type of hardwood forest. Trees grow rapidly in this area and, as a whole, they have been well managed. The Dulac-Tippah-Cuthbert soil association area supports a gum-oak-beech type of hardwood forest. The Ruston-Shubuta-Silerton soil association area is dominated by a scrub oak-hickory-beech type of hardwood forest. Here, overgrazing, fire, and the low fertility of the soils have combined to make most of the large trees poor for timber.

The county has only a few areas of native pine. These are in the Ruston-Lexington soil association area and are located just south of Lexington.

Generally, in all of the soil associations, whatever the type of forest, the direction and length of slope have influenced the forest growth. The north- and east-facing slopes support a more vigorous growth and a larger proportion of desirable species. Similarly, the trees are

<sup>5</sup>HAZARD, JAMES O. COMMON FOREST TREES OF TENNESSEE. Tenn. Dept. Conserv., Forestry Div. Ed. 10, 80 pp., illus. 1938.

more vigorous, and more desirable species grow on the lower parts of long slopes. This is probably because more moisture and colluvial materials collect around the bases of slopes.

In this county 90,833 acres is woodland. About one-fourth of this is pastured woodland, about one-fourth publicly-owned woodland, and the rest is privately owned woodland that is not pastured. Employees of the Civilian Conservation Corps planted pines in Natchez Trace State Park and surrounding areas about 20 years ago. Each year since that time, farmers have planted small areas of unproductive land to pines.

The benefits of good forest management are better timber, improved soils with better moisture relations, and better control of erosion. The forested soils are generally much more porous and absorb much more water than cultivated soils.

Prevention of fire and control of grazing are important. Fire prevention is necessary to achieve satisfactory production of timber and to maintain the maximum soil porosity. In Henderson County volunteer fire-fighting crews work with the Tennessee Department of Conservation foresters. The county has several fire towers and the fire-control program is excellent. Control of grazing increases tree growth, and allows the stand to regenerate. Overgrazing damages the soil porosity and increases erosion.

Cull trees, either young or mature, should be replaced by young hardwoods or pines. Generally, pines are suited to all of the soils of the county. On areas where a tractor can be used, pine-planting machines are available for use. On the sides of gullies and where there is a network of gullies, pine trees can be planted with a dibble. Where pines are planted with kudzu, the kudzu vines have covered the tops of the pines, shading them and stunting their growth. Black locust is not likely to grow well on these soils.

## ***Formation and Classification of Soils***

Soil results from the interaction of soil-forming processes on materials deposited or accumulated by geologic action. The characteristics of the soil at any given point are determined by (1) the type of parent material; (2) the climate under which the soil material has accumulated and existed since it accumulated; (3) the plant and animal life in and on 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.

The first part of this section deals with the foregoing factors. The second part deals with the classification of the soils.

### **Factors of Soil Formation**

Climate and vegetation are factors of soil formation that tend to be uniform throughout Henderson County. Therefore, differences in the parent material, relief, and time account for the principal differences among the soils.

#### ***Parent materials***

The parent materials of the soils of Henderson County are of two kinds—(1) residuum from the weathering of rocks in place, and (2) materials transported by water

or gravity and laid down as unconsolidated deposits of clay, silt, and sand. The residual materials are similar to the underlying rocks from which they were derived. The materials transported by water or gravity are similar to the soils or rocks from which they were washed.

The parent materials of the soils formed in place consist of weathered loess and Coastal Plain sands and clays. The soils have many of the same properties as the parent materials from which they have developed.

The kinds of transported materials are reflected in some of the properties of the soils. The Dexter, Freeland, Hatchie, and Almo soils have formed from shallow loess that overlies old alluvium transported from sand and clay Coastal Plain materials. In many places the loessal material is mixed with the Coastal Plain materials. The Shannon, Hymon, Ina, and Beechy soils have formed in these mixed materials.

Although a rather consistent relationship exists between the kind of parent material and the properties of the soils, some soil properties must be attributed to other factors.

#### ***Climate***

Henderson County has a temperate, continental climate. The summers are long and warm. The winters are short and mild. The moderately high temperatures and the generally moist condition of the soil favor rapid chemical reaction. The soil is frozen for only short periods and to only shallow depths so that the translocation of materials also takes place during the winter. The large amount of rainfall causes rather rapid movement of the soluble and colloidal materials downward through the soil.

The climate of the county is nearly uniform. Nevertheless, small local differences are caused by differences in slope gradient and direction. For example, on the south- and west-facing slopes, the average temperatures are somewhat higher than on the north- and east-facing slopes. The amount of moisture is generally less in soils on steep slopes than in soils on milder ones.

These local differences affect the chemical changes and movement of materials in the soil and also affect the growth of living matter. However small they may be, they cause differences in soil characteristics even though the parent materials are similar. Throughout the entire county, however, there is not enough difference in climate to cause broad differences in soil properties. In fact, the uniformity of the climate appears to be responsible for some of the outstanding properties that many of the soils have in common.

#### ***Living matter***

Trees, shrubs, grasses, and other herbaceous plants, and micro-organisms; earthworms, insects, and various other forms of plant and animal life live on and in the soil. These are all active in the soil-forming processes. The nature of the changes that they bring about depends, among other things, on the kind of plant or animal life and the life processes peculiar to each.

The kinds of plants and animals that live on and in the soil are determined by environmental factors such as climate, parent material, relief, and the age of the soil. The influence of climate is most apparent, though not always most important as a determinant of the kinds of macroflora that grow on the well-drained, well-developed soils. Climate, by influencing the kind of living matter,

exerts a powerful, though indirect, influence on the morphology of soils. Climate and living matter together are the active factors of soil genesis.

A forest that consisted predominantly of oak and hickory once covered most of the well-drained, well-developed soils of the county. In places there may have been large proportions of chestnut, beech, and yellow-poplar in the forest stands. There were probably differences in the density of the stands, in the relative proportion of the species, and in the associated ground cover. Nevertheless, taking the county as a whole, the forests appear to have been fairly uniform. It is doubtful if any of the marked differences in properties among the well-drained, well-developed soils are the direct result of differences in plant cover alone.

The roots of the trees that grow in this area go moderately deep to feed on the plant nutrients in the soil. The trees are mainly deciduous. They take essential plant nutrients from the lower part of the soil, store them in the leaves, and return them to the upper part of the soil when the leaves fall to the ground. The leaves of the different species vary considerably in content of plant nutrients. In general the amount of bases and phosphorus returned to the upper part of the soil in the leaves of deciduous trees is somewhat greater than that returned when pine needles and pine cones are shed.

Much organic material is added to the soil in the form of dead leaves, roots, and entire plants. Most of it is added to the surface soil where it is acted upon by chemicals and by micro-organisms, earthworms, and other forms of life. In this county the organic materials decompose rather rapidly because of the favorable temperature and moisture conditions, the favorable character of the organic material itself, and the presumably favorable micropopulation of the soil. Organic matter does not accumulate on the well-drained soils of this area to the extent that it does in cooler areas under similar conditions of drainage.

### **Relief**

In this county the dissection of the landscape was well advanced before the loess was deposited. The loess has accumulated most extensively on the wide, gently sloping ridgetops and on northwest-facing slopes.

In the more strongly dissected parts of the county, where steeper slopes predominate, the runoff washed the mantle of silt away almost as rapidly as it was deposited. Therefore little of it accumulated. The strong slopes also favor rapid geologic erosion of the weathered residual materials. As a result the formation of soils that have well-developed profiles has been retarded. On the mild slopes in the uplands, however, the soil profiles have moderately to strongly developed characteristics.

Differences in drainage are caused by differences in relief. These variations in drainage, in turn, are the major causes of differences among soils that have developed from the same kind of parent material, regardless of whether the soil is on uplands, terraces, or first bottoms. Where differences brought about by differences in drainage occur in soils derived from the same kind of parent material, the soils are grouped into a catena. One such catena of soils in Henderson County consists of soils of the Dexter, Freeland, Hatchie, and Almo series, all of which are terrace soils that have developed from shallow loess that overlies old mixed alluvium.

On the bottom lands, as well as on the uplands and terraces, differences in profile characteristics also indicate differences in drainage. Here, drainage is related to local relief, to elevation above stream level, to the height of the permanent water table, and to the frequency and duration of overflows.

### **Age**

The land surface of the county is old, and the materials have been exposed to the action of climate and biological agencies for a long time. This period of weathering has allowed strong profile characteristics to develop on most upland areas where geologic erosion is not very active. In areas where geologic erosion is active and in the valleys filled with recent alluvium, the soils do not have strongly developed profile characteristics.

## **Classification of Soils by Higher Categories**

The lower categories of soil classification—phases, types, and series—are explained in the section, How a Soil Survey is Made. Briefly, a soil type consists of one or more phases and a soil series of one or more soil types. Soil types or phases are the units shown on the detailed soil map.

Soil series are classified into the next broader category, the great soil groups. Each great soil group is made up of soils that have certain internal characteristics in common. The broadest categories of soil classification are the three soil orders—zonal, intrazonal, and azonal—into which all of the great soil groups have been placed.

Table 5 classifies the soil series of Henderson County by soil orders, great soil groups, and series. The table also shows the drainage, parent materials, relief, and degree of profile development of each series. Climate and vegetation are fairly uniform throughout the county. Therefore, they have been omitted from the table.

Zonal soils have well-developed profiles. In Henderson County they are the well-drained soils of the uplands and terraces; they occur on gentle to steep slopes where the parent material has been in place for a long time. In this county the zonal soils belong to the Red-Yellow Podzolic great soil group.

Intrazonal soils are dominantly influenced by relief, parent material, or age more than by climate or vegetation. In this county the intrazonal soils belong to the Planosols great soil group, although some of the soils classified as Planosols have properties common to Red-Yellow Podzolic soils or Gray-Brown Podzolic soils.

Azonal soils do not have well-developed profile characteristics. Their parent material has been in place only a short time, as is true of recently transported materials. In steep areas, where geologic erosion is active, the soil-forming factors of climate and living matter are retarded and, as a result, the soils are only slightly developed. The azonal soils classified as Regosols have some properties that are common to the Red-Yellow Podzolic soils. Those classified in the Alluvial great soil group have properties that are common to Low-Humic Gley soils.

### **Red-Yellow Podzolic soils**

Red-Yellow Podzolic soils are well-developed, well-drained, acid soils that have a thin organic (A<sub>0</sub>) horizon and an organic-mineral (A<sub>1</sub>) horizon. These overlie a light-colored bleached (A<sub>2</sub>) horizon. The B horizon is red,

TABLE 5.—Soil series, classified by higher categories, and the parent material, relief, and degree of profile development for each

ZONAL				
Great soil group, series, and predominant drainage	Parent material	Relief	Degree of profile development	
			As indicated by number of layers—	As indicated by contrast between layers—
ZONAL				
Red-Yellow Podzolic soils: Well drained—				
Dexter.....	Old mixed alluvium washed from loessal and sandy Coastal Plain materials and from shallow loess over old mixed alluvium.	Gently sloping to strongly sloping.	Strong.....	Strong.
Lexington.....	Shallow <sup>1</sup> loess over sandy Coastal Plain materials.	Gently sloping to moderately steep.	Strong.....	Strong.
Ruston.....	Sandy Coastal Plain materials.....	Sloping to steep.....	Strong.....	Very strong.
Silerton.....	Shallow loess over sandy clay Coastal Plain materials.	Sloping to moderately steep.	Strong.....	Strong.
Shubuta.....	Sandy clay Coastal Plain materials.....	Sloping to steep.....	Strong.....	Very strong.
INTRAZONAL				
Planosols (siltpan): Moderately well drained—				
Dulac.....	Shallow loess over sandy clay Coastal Plain materials.	Gently sloping to moderately steep.	Very strong.....	Very strong.
Freeland.....	Shallow loess over old mixed alluvium washed from loessal and Coastal Plain materials.	Gently sloping to strongly sloping.	Very strong.....	Very strong.
Providence.....	Shallow loess over sandy Coastal Plain materials.	Same.....	Very strong.....	Very strong.
Tippah.....	Shallow loess over clay Coastal Plain materials.	Same.....	Very strong.....	Very strong.
Somewhat poorly drained—				
Calloway.....	Deep loess <sup>2</sup> over sandy clay and clay Coastal Plain materials.	Gently sloping.....	Very strong.....	Strong.
Hatchie.....	Shallow loess over old mixed alluvium washed from loessal and sandy Coastal Plain materials.	Gently sloping.....	Very strong.....	Strong.
Poorly drained—				
Almo.....	Shallow loess over old mixed alluvium washed from loessal and sandy clay Coastal Plain materials.	Nearly level.....	Very strong.....	Strong.
Low-Humic Gley soils: Poorly drained—				
Beechy.....	Young alluvium washed from loessal and Coastal Plain materials.	Level to gently sloping.....	Moderate.....	Moderate.
Somewhat poorly drained—				
Ina.....	Same.....	Same.....	Moderate.....	Weak.
AZONAL				
Regosols: Well drained—				
Cuthbert.....	Sandy clay Coastal Plain materials.....	Sloping to steep.....	Moderate.....	Moderate.
Alluvial soils: Well drained—				
Shannon.....	Mixed alluvium washed from loessal and Coastal Plain materials.	Gently sloping.....	Weak.....	Weak.
Moderately well drained—				
Hymon.....	Young alluvium washed from loessal and Coastal Plain materials.	Level to gently sloping.....	Moderate.....	Weak.

<sup>1</sup> Shallow: Less than 42 inches thick.

<sup>2</sup> Deep: More than 42 inches thick.

yellowish red, or yellow and contains more clay than the A horizon. The parent materials are somewhat siliceous. Coarse reticulate streaks or mottles of red, yellow, brown, and light gray are common in the lower horizons of the Red-Yellow Podzolic soils where the parent materials are thick.

The soil-forming processes involved in the development of the Red-Yellow Podzolic soils are laterization and podzolization. These soils have developed under similar climate and vegetation. All are well drained, and, although they differ somewhat in degree of maturity, all are old enough to have at least a moderately well developed profile.

The Red-Yellow Podzolic soils are gently sloping to steep. Differences among the profile characteristics, however, probably were not caused primarily by differences in slope, although the profiles are not so well developed on the stronger slopes. Many of the differences among the soil profiles have been caused by differences in parent materials. Soils that tend to have properties in common with the yellowish soils of this group generally appear to have parent materials that are younger, or the soils are lower in bases or not so well drained internally as the reddish soils of the group.

#### DEXTER SERIES

The Dexter soils have developed from old mixed alluvium or from shallow loess that overlies old mixed alluvium. They occupy gentle to strong slopes on old terraces. They have medium runoff and internal drainage. The Dexter soils are the well-drained members of the Dexter-Freeland-Hatchie-Almo catena of soils. Differences between them and other members of the catena have probably been caused by differences in relief and in the permeability of the underlying materials. The soils have developed under deciduous forest. They are medium to strongly acid.

Profile description of Dexter silt loam:

- A<sub>1</sub> 0 to 2 inches, dark grayish-brown (10YR 4/2) very friable silt loam stained with organic matter.
- A<sub>2</sub> 2 to 8 inches, strong-brown (7.5YR 5/6) very friable silt loam; weak fine crumb structure.
- A<sub>3</sub> 8 to 11 inches, brown to dark-brown (7.5YR 4/4) friable silt loam; very weak fine subangular blocky structure.
- B<sub>1</sub> 11 to 14 inches, reddish-brown (5YR 4/3) friable heavy silt loam; weak medium blocky structure.
- B<sub>2</sub> 14 to 26 inches, yellowish-red (5YR 4/8) friable heavy silt loam; moderate medium blocky structure.
- B<sub>3</sub> 26 to 36 inches, yellowish-red (5YR 4/8) friable heavy silt loam; weak medium subangular blocky structure; gradual transition to layer below.
- C 36 inches+, predominantly yellowish red (5YR 4/8) fine sandy clay loam with yellow, brown, and gray splotches; the splotches, particularly the gray ones, increase in prominence near the water table. Stratified sand is not uncommon. Some concretions occur.

#### LXINGTON SERIES

The Lexington soils have properties common to both Red-Yellow Podzolic and Gray-Brown Podzolic soils. They are well drained. They occur in the uplands and have developed in a thin layer of loess that overlies sandy Coastal Plain materials. These soils are associated with the Providence soils. They differ from the Providence soils mainly as a result of differences in drainage. They have developed under deciduous forest and are moderately acid.

Profile description of Lexington silt loam:

- A<sub>1</sub> 0 to 2 inches, dark grayish-brown (10YR 4/2) very friable silt loam stained with organic matter.
- A<sub>2</sub> 2 to 8 inches, yellowish-brown (10YR 5/6) friable silt loam; weak fine crumb structure.
- B<sub>1</sub> 8 to 12 inches, yellowish-brown (10YR 5/6) friable to firm heavy silt loam; very weak medium subangular blocky structure.
- B<sub>2</sub> 12 to 30 inches, brown to dark-brown (7.5YR 4/4) friable light silty clay loam; weak medium blocky structure.
- C 30 to 37 inches, dark-brown (7.5YR 4/4) to strong-brown (7.5YR 5/6) friable clay loam; a few dark concretions; very weak medium subangular blocky structure.
- D 37 inches+, reddish-yellow (7.5YR 7/6) loose sand.

#### RUSTON SERIES

The Ruston series consists of well-drained upland soils that have developed from sandy Coastal Plain materials. The soils occur on sloping to moderately steep slopes. On the steeper slopes, they are less well developed. They have developed under deciduous forest and are strongly acid.

Profile description of Ruston fine sandy loam:

- A<sub>1</sub> 0 to 1 inch, a mixture of sandy material and organic matter.
- A<sub>2</sub> 1 to 24 inches, light yellowish-brown (10YR 6/4) friable fine sandy loam; moderate fine crumb structure.
- B<sub>2</sub> 24 to 30 inches, brownish-yellow (10YR 6/6) friable fine sandy clay loam; weak medium blocky structure.
- C 30 to 36 inches, variegated, but mostly strong-brown (7.5YR 5/6) friable sandy clay loam with lighter shades, particularly in the lower part; weak medium subangular blocky structure.
- D 36 inches+, mottled or variegated strong-brown (7.5YR 5/6) loamy fine sand; compact; massive, but breaks to single grains when crushed.

#### SILERTON SERIES

The Silerton series consists of well-drained soils of the uplands. These soils occur on sloping to moderately steep ridgetops and ridge slopes. They have developed under deciduous forest in a thin layer of loess that overlies sandy clay or clay Coastal Plain materials. Differences between them and the Dulac soils, with which they are associated, have been brought about by differences in drainage caused by differences in relief, in the kind of parent material, and in the permeability of the underlying material.

Profile description of Silerton silt loam:

- A<sub>1</sub> 0 to 1 inch, dark grayish-brown (10YR 4/2) very friable silt loam; moderate medium granular structure.
- A<sub>2</sub> 1 to 8 inches, light yellowish-brown (10YR 6/4) friable silt loam; weak medium subangular blocky structure, but under pressure, breaks easily to weak fine granular fragments; abrupt boundary.
- B<sub>2</sub> 8 to 20 inches, strong-brown (7.5YR 5/6) friable to firm silty clay loam with strong medium subangular blocky structure; gradual boundary.
- B<sub>3</sub> 20 to 30 inches, brownish-yellow (10YR 6/6) firm silty clay faintly mottled with strong brown (7.5YR 5/6); moderate medium subangular blocky structure.
- C 30 inches+, mottled strong-brown (7.5YR 5/6) and olive (5Y 5/4) very firm micaceous silty clay that grades with depth to brittle sandy clay.

#### SHUBUTA SERIES

The Shubuta series consists of well-drained soils of the uplands. They have sloping to steep relief. These soils have developed in sandy clay Coastal Plain materials under deciduous forest. The forest now consists mainly of white oak, beech, and hickory, but the type of forest is apparently a result of the kind of soils rather than the

cause of differences between these and other soils. The soils have developed enough to be classified as zonal, although on the steep slopes some of the profiles are not so well developed as is typical of zonal soils.

Profile description of Shubuta fine sandy loam:

- A<sub>1</sub> 0 to 2 inches, dark-brown (10YR 4/3) loose very fine sandy loam; weak fine granular structure.
- A<sub>2</sub> 2 to 5 inches, olive-brown (2.5Y 4/4) very friable fine sandy loam; very weak medium subangular blocky structure.
- B<sub>1</sub> 5 to 7 inches, strong-brown (7.5YR 5/6) friable sandy clay loam; weak medium subangular blocky structure.
- B<sub>2</sub> 7 to 14 inches, yellowish-red (5YR 5/6) very firm sandy clay with a few olive specks; some small mica flakes; strong medium blocky structure.
- C 14 to 30 inches, yellowish-red (5YR 4/6) and olive-yellow (2.5Y 6/6) very firm brittle sandy clay; weak coarse angular blocky structure.
- D 30 inches+, red (10R 4/6) firm sandy clay with a few fine distinct mottles of gray (2.5Y 6/0); massive structure.

### Planosols

Planosols are intrazonal soils that have one or more cemented or compacted horizons high in content of clay. The compacted horizons are in abrupt contrast to the adjacent horizons. The Planosols have formed under forest or grass in a humid or subhumid climate. The compacted layers are predominantly silt and are below the B<sub>2</sub> layer. All of the Planosols in Henderson County have silt pans.

The Freeland, Tippah, Providence, and Dulac soils are Planosols that have some properties common both to Red-Yellow Podzolic and Gray-Brown Podzolic soils.

#### DULAC SERIES

The Dulac soils are moderately well drained pan soils of the uplands. They have developed in a thin layer of loess that overlies sandy clay Coastal Plain materials. The soils occur on gentle to moderately steep slopes and have developed under deciduous forest.

Profile description of Dulac silt loam:

- A<sub>1</sub> 0 to 1 inch, dark grayish-brown (10YR 4/2) very friable silt loam.
- A<sub>2</sub> 1 to 7 inches, light yellowish-brown (10YR 6/4) friable silt loam; weak fine crumb structure.
- B<sub>2</sub> 7 to 21 inches, strong-brown (7.5YR 5/6) friable to firm heavy silt loam; moderate medium subangular blocky structure.
- B<sub>3m1</sub> 21 to 24 inches, mottled, yellowish-brown (10YR 5/6) and light-gray (2.5Y 7/2) silt loam; more friable than layer immediately above; weak medium subangular blocky structure.
- B<sub>3m2</sub> 24 to 32 inches, mottled, light-gray (2.5Y 7/2) and strong-brown (7.5YR 5/6) compact heavy silt loam; moderate medium angular blocky structure.
- C 32 to 40 inches, mottled, gray (2.5Y 7/2) and strong-brown (7.5YR 5/6) friable silt loam with seams of light-gray (2.5Y 7/2) clay; weak medium angular blocky structure; diffuse boundary.
- D 40 inches+, yellowish-red (5YR 4/6), mottled with olive-gray (5Y 5/2) firm sandy clay; massive.

#### FREELAND SERIES

The Freeland soils are moderately well drained, old terrace pan soils. They occur on gentle to strong slopes. The soils have formed under deciduous forest in shallow loess that overlies old mixed alluvium. The old alluvium consists of silty loess and sandy Coastal Plain materials. The soils are moderately to strongly acid. They are members of the Dexter-Freeland-Hatchie-Almo catena of soils. The differences between them and other members

of the catena were probably caused by differences in relief and in permeability of the parent material.

Profile description of Freeland silt loam:

- A<sub>1</sub> 0 to 1 inch, dark grayish-brown (10YR 4/2) very friable silt loam.
- A<sub>2</sub> 1 to 6 inches, brown to dark-brown (10YR 4/3) friable silt loam; weak fine crumb structure.
- B<sub>2</sub> 6 to 24 inches, yellowish-brown (10YR 5/4) friable heavy silt loam; weak medium subangular blocky structure.
- B<sub>3m</sub> 24 to 42 inches, (siltpan) brown to dark-brown (10YR 4/3), pale-brown (10YR 6/3), yellowish-brown (10YR 5/4), and gray to light-gray (5Y 6/1), firm light silty clay loam; many large distinct mottles; moderate coarse angular blocky structure.
- C 42 inches+, brown to dark-brown (10YR 4/3) friable loam; a few light-gray mottles; weak coarse angular blocky to massive structure.

#### PROVIDENCE SERIES

The Providence soils are moderately well drained pan soils of the uplands. They have developed in a thin layer of loess that overlies permeable sandy Coastal Plain materials. These soils have developed under deciduous forest. They occur on gentle to strong slopes and are moderately to strongly acid.

Profile description of Providence silt loam:

- A<sub>1</sub> 0 to 1 inch, dark grayish-brown (10YR 4/2) very friable silt loam.
- A<sub>2</sub> 1 to 6 inches, yellowish-brown (10YR 5/4) very friable silt loam; weak fine crumb structure.
- B<sub>2</sub> 6 to 28 inches, yellowish-brown (10YR 5/6) heavy silt loam; moderate medium subangular blocky structure; rather abrupt transition to layer below.
- B<sub>3m</sub> 28 to 40 inches, dark-brown (7.5YR 4/4) and light brownish-gray (2.5Y 6/2) compact silt loam; many large distinct mottles; coarse angular blocky structure; gradual transition to sandier material in layer below.
- D 40 inches+, dark reddish-brown (5YR 3/4) fine sandy loam that grades to sand; a few faint light brownish-gray (2.5Y 6/2) mottles; single grain structure when crushed.

#### TIPPAH SERIES

The Tippah soils occur on uplands. They have developed in a thin layer of loess that overlies plastic clay Coastal Plain materials. They are moderately well drained and commonly have a siltpan about 2 feet below the surface. These soils are associated with the Dulac soils and differ from the Dulac mainly as a result of differences in underlying material. They occur on gently sloping to strongly sloping ridgetops. They have developed under deciduous forest and are strongly acid.

Profile description of Tippah silt loam:

- A<sub>1</sub> 0 to 1 inch, dark grayish-brown (10YR 4/2) very friable silt loam, stained dark with organic matter.
- A<sub>2</sub> 1 to 6 inches, light yellowish-brown (10YR 6/4) friable silt loam; weak fine crumb structure.
- B<sub>2</sub> 6 to 22 inches, dark yellowish-brown (10YR 4/4) to strong-brown (7.5YR 5/6), firm silty clay loam; moderate medium blocky structure.
- B<sub>2m</sub> 22 to 32 inches, (siltpan) pale-olive (5Y 6/4), olive (5Y 5/3), light brownish-gray (2.5Y 6/2), and brown to dark-brown (10YR 4/3), firm silty clay loam; many large distinct mottles; moderate medium angular blocky structure.
- C<sub>1</sub> 32 to 36 inches, strong-brown (7.5YR 5/6) plastic clay with many medium distinct mottles of yellowish red (5YR 4/6) and grayish brown (2.5Y 5/2); strong medium angular blocky structure.
- C<sub>2</sub> 36 inches+, yellowish-red (5YR 4/6) plastic clay splotted with light olive gray (2.5Y 6/2); massive but breaks, under pressure, to large angular fragments.

## CALLOWAY SERIES

The Calloway series consists of somewhat poorly drained pan soils of the uplands. The soils have developed in a fairly thick layer of loess that overlies Coastal Plain sandy clays and clays. They have developed under deciduous forest on broad gently sloping ridgetops. The Calloway soils differ from some phases of Dulac and Tippah soils, with which they are associated, in relief and in permeability of the parent material. They are strongly acid.

Profile description of Calloway silt loam:

- A<sub>1</sub> 0 to 1½ inches, very dark grayish brown (10YR 3/2) very friable silt loam stained with organic matter.
- A<sub>2</sub> 1½ to 8 inches, dark grayish-brown (10YR 4/2) very friable silt loam; very weak fine crumb structure.
- B<sub>1</sub> 8 to 12 inches, yellowish-brown (10YR 5/4) friable silt loam; moderate medium angular blocky structure.
- B<sub>2</sub> 12 to 22 inches, light olive-brown (2.5Y 5/4) friable heavy silt loam; common fine faint mottles of light brownish gray (2.5Y 6/2) and a few medium-sized soft, brown concretions; moderate fine and medium angular blocky structure.
- B<sub>3</sub> 22 to 26 inches, firm silt loam, fine faint mottles of light olive brown (2.5Y 5/4), light yellowish brown (2.5Y 6/4), and light brownish gray (2.5Y 6/2); moderate medium angular blocky structure.
- B<sub>3m</sub> 26 to 42 inches, light-gray to gray (2.5Y 7/2) to grayish-brown (2.5Y 5/2) mottled with yellowish brown (10YR 5/8), firm heavy silt loam to silty clay loam; moderate medium angular blocky structure with strong coarse columnar macrostructure and strong medium angular microstructure in the lower part; contains dark-brown soft concretions.
- C 42 to 58 inches, grayish-brown (2.5Y 5/2) compact firm heavy silt loam with seams of gray clay; common large mottles of dark brown (7.5YR 4/4) and yellowish brown (10YR 5/6); weak medium and coarse angular blocky structure.
- D 58 inches+, yellowish-brown (10YR 5/6) firm fine sandy clay; common medium distinct mottles of light brownish gray (10YR 6/2) and dark brown (7.5YR 4/4); moderate medium angular blocky structure.

## HATCHIE SERIES

The Hatchie soils are the somewhat poorly drained members of the Dexter-Freeland-Hatchie-Almo catena of soils. They have formed on gently sloping terraces in shallow loess that overlies old mixed alluvium. The alluvium consists of silty loess and sandy Coastal Plain materials. These soils have formed under deciduous forest and are strongly acid. The differences between them and other members of the catena have probably been caused by differences in relief and in the permeability of the parent and underlying material. Only one mapping unit of this series, Hatchie silt loam, gently sloping phase, occurs in this county.

Profile description of Hatchie silt loam:

- A<sub>1</sub> 0 to 1 inch, dark grayish-brown (10YR 4/2) very friable silt loam.
- A<sub>2</sub> 1 to 6 inches, brown (10YR 5/3) friable silt loam; weak fine crumb structure.
- B<sub>2</sub> 6 to 16 inches, yellowish-brown (10YR 5/4) friable silt loam; a few fine faint light brownish-gray (2.5Y 6/2) and light olive-brown (2.5Y 5/4) mottles, increasing in number with depth; weak medium sub-angular blocky structure.
- B<sub>3m</sub> 16 to 34 inches, firm silty clay loam with light-gray (5Y 7/1) silt in the seams; many large distinct mottles of light yellowish brown (10YR 6/4), light olive gray (5Y 6/2), and white (5Y 7/1); weak coarse angular blocky structure.

- C 34 to 42 inches, mottled brownish-yellow (10YR 6/6) and light-gray (2.5Y 7/2) loam; compact; massive.
- D 42 inches+, dark-brown (7.5YR 4/4) friable fine sandy loam; a few faint light-gray (2.5Y 7/2) mottles; massive but breaks to single grain when crushed.

## ALMO SERIES

The Almo soils are the poorly drained members of the Dexter-Freeland-Hatchie-Almo catena. They have formed in shallow loess that overlies old mixed alluvium. The old mixed alluvium consists of silty loessal material and Coastal Plain sands and clays. These soils occupy nearly level old terrace positions. They have formed under deciduous forest and are strongly acid. The differences between them and other members of the catena were probably caused by differences in relief and in the permeability of the parent material and substratum. Only one soil of this series, Almo silt loam, occurs in Henderson County.

Profile description of Almo silt loam:

- A<sub>1</sub> 0 to 1 inch, light-gray (10YR 7/1) very friable silt loam splotted with darker organic stains.
- A<sub>2</sub> 1 to 8 inches, light-gray (10YR 7/1) very friable silt loam with a few faint mottles of yellow (10YR 7/6) and brown (10YR 5/3); contains iron concretions; weak fine crumb structure.
- B<sub>2</sub> 8 to 12 inches, gray (10YR 6/1) friable silt loam; mottled with yellowish brown (10YR 5/4); weak fine sub-angular blocky structure.
- B<sub>3m</sub> 12 to 24 inches, mottled yellowish-brown (10YR 5/6) and gray (10YR 6/1) firm light silty clay loam; common iron concretions; weak medium angular blocky structure.
- C 24 to 42 inches, mottled gray (10YR 6/1) and yellowish-brown (10YR 5/6) light silty clay loam; more friable than layer immediately above; very weak coarse angular blocky structure; contains many iron concretions.
- D 42 inches+, mottled, light-gray (10YR 7/2), brown (10YR 5/3), and yellow (10YR 7/6) friable very fine sandy clay loam; the content of sand increases with depth.

## Low-Humic Gley soils

Low-Humic Gley soils are an intrazonal group of somewhat poorly drained to poorly drained soils. They have a very thin surface horizon moderately high in organic matter. This overlies mottled gray and brown gleyed mineral horizons that have little textural differentiation. The soils of the two series in this great soil group are developing in young alluvium.

## BEECHY SERIES

The Beechy soils are true Low-Humic Gley soils. Their profile is gleyed throughout, and little, if any, textural development is evident. The soils are poorly drained. They occur on the lower parts of the first bottoms in association with Ina soils and with the local alluvium phases of the Shannon and Hymon.

Profile description of Beechy silt loam:

- 0 to 4 inches, very dark grayish-brown (2.5Y 3/2) very friable silt loam; weak granular structure.
- 4 inches+, friable silt loam; many large distinct mottles of light gray (2.5Y 7/2), olive brown (2.5Y 4/4), and yellowish brown (10YR 5/6); structureless; strata of sand are common.

## INA SERIES

The Ina series is the somewhat poorly drained member of the Shannon-Hymon-Ina-Beechy catena. The soils are associated with the other soils of the catena. They

are somewhat better drained than the Beechy soils and are, therefore, somewhat less gleyed. The parent material is young alluvium washed from loess and Coastal Plain materials. These soils may be considered intergrades to Alluvial soils and, therefore, show less development than the Beechy soils.

Profile description of Ina silt loam:

- 0 to 10 inches, brown to dark-brown (10YR 4/3) very friable silt loam; very weak fine granular structure.
- 10 inches+, mottled, light-gray (5Y 7/1) and yellowish-brown (10YR 5/4) very friable loam; mottles are many, large, and distinct; very weak fine granular structure but becomes massive at a depth of 40 inches.

### Regosols

Regosols are azonal soils that consist of deep unconsolidated rock (soft mineral deposits). In these soils few, if any, clearly expressed soil characteristics have developed. In Henderson County, Regosols are represented by only one series, the Cuthbert.

#### CUTHBERT SERIES

The Cuthbert soils are well-drained soils of the uplands that have developed in brittle, acid, sandy clay Coastal Plain materials. They are associated with the Shubuta soils and differ from them mainly in degree of profile development. They have some properties common to soils of the Red-Yellow Podzolic great soil group, but there has not been enough profile development to place them in that group. The Cuthbert soils have formed under deciduous forest and are strongly acid. Generally, in Henderson County, appreciable amounts of silt are mixed with the upper 10 inches of sandy material.

Profile of Cuthbert very fine sandy loam:

- A<sub>1</sub> 0 to 1 inch, dark grayish-brown (10YR 4/2) very friable very fine sandy loam mixed with organic matter.
- A<sub>2</sub> 1 to 5 inches, dark yellowish-brown (10YR 4/4) friable silt loam.
- B<sub>2</sub> 5 to 12 inches, reddish-yellow (7.5YR 6/8) friable clay loam; moderate medium subangular blocky structure.
- C 12 inches+, mottled or streaked reddish-yellow (7.5YR 6/8) and light-gray (5Y 7/1) clay and sandy material or laminated beds of light-gray clay and yellowish sandy material; colors of the sands and clays vary widely; many iron concretions in some places.

### Alluvial soils

Alluvial soils, classified as azonal, are developing from transported and recently deposited material (alluvium). The soil materials have not been in place long enough to form differentiated horizons.

#### SHANNON SERIES

The Shannon series consists of well-drained soils that show little or no gleization. The soils have the best drainage of any of the soils of the Shannon-Hymon-Ina-Beechy catena, but they are the least developed. Generally, the Shannon soils occupy the highest positions on the bottom lands. Only one soil of this series, Shannon silt loam, local alluvium phase, occurs in this county.

Profile description of Shannon silt loam (cultivated):

- 0 to 6 inches, dark-brown to very dark grayish-brown (10YR 4/3 to 3/2) very friable silt loam; contains some fine sand.
- 6 to 42 inches, dark-brown (7.5YR 3/2) friable silt loam; weak medium granular structure; a few distinct mottles of light gray (2.5Y 7/2); some sand at depths of 42 inches.

#### HYMON SERIES

The Hymon soils are moderately well drained. They show some gleization below depths of 14 to 20 inches. They are forming in young alluvium. The materials have not been in place long enough to show textural differentiation. The Hymon soils are associated with the Ina soils.

Profile description of Hymon silt loam:

- 0 to 20 inches, brown to dark-brown (10YR 4/3) very friable silt loam; weak granular structure; few faint light-gray (5Y 7/1) mottles at a depth of 14 inches, increasing in size and distinctness with depth.
- 20 inches+, light-gray (5Y 7/1), pale-olive (5Y 6/4), and brown to dark-brown (10YR 4/3) friable silt loam; some thin layers of loose sand; very weak fine granular structure to structureless.

## Engineering applications<sup>6</sup>

This soil survey report of Henderson County, Tenn., contains information that can be used by engineers to—

- (1) Make soil and land use studies that will aid in the selecting and developing of industrial, business, residential, and recreational sites.
- (2) Make estimates of runoff and erosion characteristics for use in designing drainage structures and planning dams and other structures for water and soil conservation.
- (3) Make reconnaissance surveys of soil and ground conditions that will aid in selecting locations for highways and airports and in planning detailed soil surveys for the intended locations.
- (4) Locate sand and gravel for use in structures.
- (5) Correlate pavement performance with types of soil and thus develop information that will be useful in designing and maintaining the pavements.
- (6) Determine the suitability of soil units for cross-country movements of vehicles and construction equipment.
- (7) Supplement other sources of information in making engineering soil maps and reports.

*The soil map and the descriptive report are somewhat generalized, and should be used only in planning more detailed field surveys to determine the in-place condition of the soil at the site of the proposed engineering construction. The soil map and report should be a valuable aid to preliminary planning, however, and in many areas can reduce substantially the time spent in on-the-spot investigations.*

## Soil Science Terminology

Some of the terms used by the agricultural soil scientists may be unfamiliar to the engineer, and some words—for example, soil, sand, silt, clay, granular, crumb, angular or subangular blocky—may have special meanings in soil science. These and other special terms that are used in the soil survey report are defined in the glossary at the back of this report.

<sup>6</sup> This section was prepared by the Soil Conservation Service, with the assistance of engineers from the Bureau of Public Roads and the Tennessee Department of Highways. Test data in table 6 were obtained in the Soils Laboratory, Bureau of Public Roads.

TABLE 6.—Engineering test data<sup>1</sup> for

Soil and location	Parent material	Bureau of Public Roads report number	Depth	Moisture-density	
				Maximum dry density	Optimum moisture
Almo silt loam: 1.75 miles northeast of New Hope Church; 20 miles south of Darden.	Mixed loessal and Coastal Plain materials.	92916	<i>Inches</i> 0-4	<i>Lb. per cu. ft.</i> 107	<i>Percent</i> 16
		92917	4-14	107	15
		92918	14+	112	14
Calloway silt loam, gently sloping phase: 1.0 miles southwest of Poplar Corner Church; 1.0 miles west of Union Cross.	Deep <sup>6</sup> loess.....	92941	0-6	110	14
		92942	6-15	113	14
		92943	15-36	110	15
		92944	36+	110	16
Cuthbert-Silerton soils, moderately steep phases: 0.25 miles west of Ridley on Highway 100; 3.0 miles southwest of Reagen.  0.5 miles north of Chesterfield.....	Mantle of thin <sup>7</sup> loess over Coastal Plain materials.	92936	0-4	109	14
		92937	4-12	114	13
		92938	12+	109	16
	Coastal Plain materials.....	92939	2-9	119	12
		92940	9+	99	24
Dulac and Tippah silt loams, sloping phases: 0.25 miles west of Cedar Grove School.....  0.25 miles west of Anderson's Store; 2.0 miles south of Threadgills Store.	Shallow <sup>7</sup> loess over Coastal Plain materials.	92929	0-6	107	15
		92930	6-22	103	20
		92931	22-32	109	17
		92932	32+	91	27
	Shallow <sup>7</sup> loess over Coastal Plain materials.	92945	0-6	104	15
		92946	6-24	106	18
		92947	24-42	112	15
		92948	42+	114	15
Freeland silt loam, eroded gently sloping phase: 2.75 miles south of Chesterfield.....	Mixed loessal and Coastal Plain materials.	92912	0-6	107	15
		92913	6-24	110	16
		92914	24-42	109	17
		92915	42+	115	14
Hatchie silt loam: 2.25 miles west of Taylors Crossing on Highway 100; 0.25 miles right on gravel road.	Mixed loessal and Coastal Plain materials.	92908	0-5	115	12
		92909	5-16	112	15
		92910	16-34	112	15
		92911	34+	117	14
Hymon silt loam: 2.5 miles southwest of Chesterfield.....	Mixed loessal and Coastal Plain materials.	92906	0-20	106	18
		92907	20+	107	17
Lexington silt loam, eroded gently sloping phase: 0.25 miles east of Timberlake.....	Shallow <sup>7</sup> loess over Coastal Plain materials.	92923	0-6	110	14
		92924	6-34	107	18
		92925	34+	114	15
Providence silt loam, sloping phase: 2.0 miles north of Lexington and 0.25 miles west of Highway 22.	Shallow <sup>7</sup> loess over Coastal Plain materials.	92919	0-6	108	14
		92920	6-28	108	18
		92921	28-40	114	15
		92922	40+	119	12
Ruston fine sandy loam, moderately steep phase: 100 yards southeast of Oak Grove Church; 3.0 miles east of Lexington.	Coastal Plain materials.....	92926	0-3	107	15
		92927	3-18	125	8
		92928	18+	124	11
Silerton silt loam, sloping phase: 1.5 miles north of Chesterfield.....	Shallow <sup>7</sup> loess over Coastal Plain materials.	92933	0-7	104	16
		92934	7-24	104	20
		92935	24+	110	16

<sup>1</sup> Tests performed by Bureau of Public Roads in accordance with standard procedures of the American Association of State Highway Officials (A. A. S. H. O.).

<sup>2</sup> Mechanical analyses are based on the soil samples as received by the Bureau of Public Roads Laboratory and tested according to the A. A. S. H. O. Designation: T 88-58. Results by this procedure frequently differ somewhat from results that would have

been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the A. A. S. H. O. procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material in the soil sample, including that coarser than 2 mm. in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 mm. in diameter is

soil samples taken from 13 soil profiles

Mechanical analysis <sup>2</sup>											Liquid limit	Plasticity index	Classification	
Percentage passing sieve <sup>3</sup>							Percentage smaller than <sup>3</sup>						A. A. S. H. O. <sup>4</sup>	Unified <sup>5</sup>
¾-in.	⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
			100	99	98	93	87	64	21	15	27	5	A-4 (8)-----	ML-CL.
			100	99	98	93	87	64	22	14	27	5	A-4 (8)-----	ML-CL.
			100	99	97	88	83	64	28	21	27	8	A-4 (8)-----	CL.
			100	96	91	82	77	58	22	17	26	6	A-4 (8)-----	ML-CL.
			100	97	93	85	81	64	30	24	30	11	A-6 (8)-----	CL.
			100	98	94	87	84	68	33	26	35	15	A-6 (10)-----	CL.
			100	97	92	83	74	64	32	27	38	18	A-6 (11)-----	CL.
			100	98	94	80	72	50	18	13	22	3	A-4 (8)-----	ML.
			100	98	95	83	77	56	23	16	22	4	A-4 (8)-----	ML-CL.
			100	98	97	90	85	68	39	33	41	19	A-7-6 (12)-----	CL.
100	99	94	89	86	83	46	39	27	13	10	18	2	A-4 (2)-----	SM.
			100	99	97	80	74	65	56	52	63	37	A-7-6 (20)-----	CH.
			100	99	98	88	81	57	17	11	23	3	A-4 (8)-----	ML.
				100	99	93	89	73	41	35	47	23	A-7-6 (15)-----	CL.
			100	99	98	85	80	62	34	29	39	17	A-6 (11)-----	CL.
				100	99	87	83	74	65	62	81	47	A-7-5 (20)-----	CH.
				100	99	95	90	66	18	13	24	2	A-4 (8)-----	ML.
					100	98	95	79	41	35	46	22	A-7-6 (14)-----	CL.
			100	99	98	92	87	67	29	24	35	15	A-6 (10)-----	CL.
			100	99	98	88	82	64	32	27	31	14	A-6 (10)-----	CL.
			100	99	97	94	89	68	21	15	25	2	A-4 (8)-----	ML.
				100	99	99	97	93	75	35	36	15	A-6 (10)-----	CL.
			100	99	97	93	88	69	33	26	40	18	A-6 (11)-----	CL.
			100	98	96	89	83	64	27	20	30	12	A-6 (9)-----	CL.
			100	98	95	77	64	40	17	13	20	2	A-4 (8)-----	ML.
			100	99	97	85	76	53	26	20	30	10	A-4 (8)-----	CL.
			100	99	97	85	74	51	26	21	32	12	A-6 (9)-----	CL.
			100	99	97	78	66	43	23	19	28	10	A-4 (8)-----	CL.
					100	92	88	72	39	28	33	10	A-4 (8)-----	ML-CL.
					100	85	80	63	33	25	33	11	A-6 (8)-----	ML-CL.
			100	98	96	94	88	62	19	14	25	5	A-4 (8)-----	ML-CL.
				100	99	98	94	76	37	30	44	22	A-7-6 (14)-----	CL.
			100	95	85	79	75	57	26	21	32	12	A-6 (9)-----	CL.
			100	97	92	87	82	60	19	11	24	4	A-4 (8)-----	ML-CL.
			100	98	95	92	89	72	33	26	39	17	A-6 (11)-----	CL.
			100	96	88	79	75	57	23	18	30	11	A-6 (8)-----	CL.
			100	94	83	71	68	52	23	18	27	10	A-4 (7)-----	CL.
			100	86	70	51	47	34	12	7	26	2	A-4 (3)-----	ML.
			100	84	66	40	36	27	12	7	14	0	A-4 (1)-----	SM.
			100	85	65	41	38	28	15	13	20	5	A-4 (1)-----	SM-SC.
			100	99	99	97	89	63	23	17	26	4	A-4 (8)-----	ML-CL.
					100	99	93	74	41	36	45	20	A-7-6 (13)-----	ML-CL.
	100	95	89	84	83	80	71	52	36	30	43	22	A-7-6 (13)-----	CL.

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

<sup>3</sup> Based on total material. Laboratory test data corrected for amount discarded in field sampling.

<sup>4</sup> Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (pt. 1, ed. 7): The Classification

of Soils and Soil-Aggregate Mixtures for Highway Purposes, A. A. S. H. O. Designation: M 145-49.

<sup>5</sup> The Unified Soil Classification System, Tech. Memo. No. 3-357, v. 1, Waterways Experiment Station, Corps of Engineers, March 1953.

<sup>6</sup> Deep=more than 42 inches thick.

<sup>7</sup> Shallow=less than 42 inches thick.

### Soil Test Data and Engineering Soil Classification

The engineer should know the physical properties of the soil materials and the in-place condition of the soil so that he can make the best use of the soil maps. After testing the soil materials and observing the behavior of the soils when used in engineering structures and foundations, the engineer can develop and recommend designs to be used for structures on these soils.

#### Soil test data

Soil samples from the principal soil type of each of 9 extensive series and 2 soil complexes were tested in accordance with standard procedures<sup>7</sup> to help evaluate the soils for engineering purposes. The test data are given in table 6.

The engineering soil classifications in table 6 are based on data obtained by mechanical analyses and by tests made to determine the liquid limits and plastic limits. Mechanical analyses were made by combined sieve and hydrometer methods. Percentages of clay obtained by the hydrometer method should not be used in naming soil textural classes.

The liquid-limit and plastic-limit tests measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a solid to a semisolid or 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

<sup>7</sup> AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS. STANDARD SPECIFICATIONS FOR HIGHWAY MATERIALS AND METHODS OF SAMPLING AND TESTING. Ed. 7, 2 v., illus. 1955.

at which the soil material passes from a solid to a plastic state. The liquid limit is the moisture content at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition.

Table 6 also gives compaction (moisture-density) data for the tested soils. If a soil material is compacted at successively higher moisture contents, assuming that the compactive effort remains constant, the density of the compacted material will increase until the "optimum moisture content" is reached. After that, the density decreases with increase in moisture content. The highest dry density obtained in a compaction test is termed "maximum dry density." Moisture-density data are important in earthwork, for, as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

#### Engineering classification systems

Most highway engineers classify soil materials in accordance with the system approved by the American Association of State Highway Officials (table 7). In this system soil materials are classified in seven principal groups. The groups range from A-1, consisting of gravelly soils of high bearing capacity, to A-7, consisting of clay soils having low strength when wet. Within each group the relative engineering value of the soil material is indicated by a group index number. Group index numbers range from 0 for the best materials to 20 for the poorest. The group

TABLE 7.—Classification of soils by American

General classification	Granular materials (35 percent)				
Group classification	A-1		A-3	A-2	
	A-1-a	A-1-b		A-2-4	A-2-5
Sieve analysis: Percent passing.					
No. 10.....	50 maximum.	50 maximum.	51 minimum.		
No. 40.....	30 maximum.	25 maximum.	10 maximum.	35 maximum.	35 maximum.
No. 200.....	15 maximum.				
Characteristics of fraction passing No. 40 sieve—					
Liquid limit.....	6 maximum.	6 maximum.	NP. <sup>2</sup>	40 maximum.	41 minimum.
Plasticity index.....			NP.	10 maximum.	10 maximum.
Group index.....	0	0	0	0	0
Usual types of significant constituent materials.	Stone fragments, gravel, and sand.	Stone fragments, gravel, and sand.	Fine sand.	Silty gravel and sand.	Silty gravel and sand.
General rating as subgrade....	Excellent to good				

<sup>1</sup> Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, ed. 7) A. A. S. H. O. Designation: M 145-49.

index number is shown in parentheses, following the soil group symbol, in the next to last column of table 6. The principal characteristics according to which the soils are classified in this system are shown in table 7.

Some engineers prefer to use the Unified Soil Classification system.<sup>8</sup> In this system soil materials are identified as coarse grained (8 classes), fine grained (6 classes), or highly organic. The principal characteristics of the 15 classes of soil are given in table 8. The classification of the tested soils according to the Unified system is given in the last column of table 6.

### Soil Engineering Data and Recommendations

Some of the engineering information can be obtained from the soil map. It will often be necessary, however, to refer to other sections of the report, particularly to the sections entitled General Nature of the Area, Soil Descriptions, and Formation and Classification of Soils.

Suitable sites for ponds can be found on most of the soils in the county. Failures of ponds are common, however, in some areas of the Shubuta soils, which are very high in clay, and in some areas of Ruston soils, which have lenses of loose sand.

The highway soil engineering data given in tables 9 and 10 are based on the soil test data given in table 6, on information in other sections of the report, and on experience with the same kind of soil in other counties.

<sup>8</sup> WATERWAYS EXPERIMENT STATION. UNIFIED SOIL CLASSIFICATION SYSTEM. 3v., Corps of Engin., U. S. Army Tech. Memo. 3-357. Prepared for Off., Chief of Engin., Vicksburg, Miss. 1953.

The location, design, and construction of highways are influenced by unstable soil materials, adverse moisture conditions, kind of bedrock and depth to it, the occurrence of boulders, and the availability of road-building materials. In this county failures in the roadbed have been observed in places where the roadbed overlies fine clays, as in some areas of the Shubuta soils. The soils in road cuts are subject to severe sliding if layers of sand are interbedded with layers of sandy clay or clay, as in the Ruston soils.

During prolonged wet periods the Providence, Dulac, Tippah, Freeland, Hatchie, Calloway, and Almo soils are likely to have moderate to large amounts of seepage just over the siltpan, which generally is at depths of 1 to 3 feet. This usually occurs during the late fall or in winter and spring. During the wettest periods, all of these soils have a perched water table at or near the surface. Ordinarily, seepage can be controlled by interceptor ditches or underdrains.

The low-lying areas of bottom lands are likely to be flooded each year. In these low areas a continuous embankment may be needed to keep roads above high water.

In this county bedrock is at depths of about 200 feet. In a few areas there are occasional boulders of ironstone in soils that have developed in Coastal Plain materials, and in their substratum.

In the well drained and moderately well drained sandy soils (low in clay) that occur on the uplands and terraces, earthwork usually can be carried on during the winter, provided the required standards of construction are maintained in relation to the compaction of the soils. Earthwork in the clayey soils, such as the Shubuta and Cuthbert, and in the more poorly drained soils of the uplands,

### Association of State Highway Officials <sup>1</sup>

or less passing No. 200 sieve)		Silt-clay materials (More than 35 percent passing No. 200 sieve)				
A-2—Continued		A-4	A-5	A-6	A-7	
A-2-6	A-2-7				A-7-5	A-7-6
35 maximum.	35 maximum.	36 minimum.	36 minimum.	36 minimum.	36 minimum.	36 minimum.
40 maximum. 11 minimum.	41 minimum. 11 minimum.	40 maximum. 10 maximum.	41 minimum. 10 maximum.	40 maximum. 11 minimum.	41 minimum. 11 minimum. <sup>3</sup>	41 minimum. 11 minimum. <sup>3</sup>
4 maximum.	4 maximum.	8 maximum.	12 maximum.	16 maximum.	20 maximum.	20 maximum.
Clayey gravel and sand.	Clayey gravel and sand.	Nonplastic to moderately plastic silty soils.	Highly elastic silts.	Medium plastic clays.	Highly plastic clays.	Highly plastic clays.
Fair to poor						

<sup>2</sup> NP=Nonplastic.

<sup>3</sup> Plasticity index of A-7-5 subgroup is equal to or less than LL minus 30. Plasticity index of A-7-6 subgroup is greater than LL minus 30.

terraces, and bottoms is difficult during prolonged wet periods and when the water table is high.

Ratings are given in table 10 for the suitability of the layers of various soils as sources of topsoil that will promote the growth of vegetation on embankments, ditches, and cut slopes. Sandy loams are preferred on shoulders that are to support limited traffic.

Suitable sources of sand for use in the reinforcement of subgrades can be found in Sandy alluvial land, the substratum of the Shannon soils, and the Coastal Plain materials underlying the Ruston, Lexington, and Providence soils. The Coastal Plain materials and the terrace substrata of some of the Cuthbert, Dexter, and Free-land soils will provide a mixture of sand and clay for use

TABLE 8.—*Characteristics of soil groups*

Major divisions	Group symbol	Soil description	Value as foundation material <sup>2</sup>	Value as base course directly under bituminous pavement	
Coarse-grained soils ( <i>less than 50 percent passing No. 200 sieve</i> ): Gravels and gravelly soils ( <i>more than half of coarse fraction retained on No. 4 sieve</i> ).	GW	Well-graded gravels and gravel-sand mixtures; little or no fines.	Excellent.....	Good.....	
	GP	Poorly graded gravels and gravel-sand mixtures; little or no fines.	Good to excellent....	Poor to fair.....	
	GM	Silty gravels and gravel-sand-silt mixtures.	Good.....	Poor to good.....	
	GC	Clayey gravels and gravel-sand-clay mixtures.	Good.....	Poor.....	
	Sands and sandy soils ( <i>more than half of coarse fraction passing No. 4 sieve</i> ).	SW	Well-graded sands and gravelly sands; little or no fines.	Good.....	Poor.....
		SP	Poorly graded sands and gravelly sands; little or no fines.	Fair to good.....	Poor to not suitable..
		SM	Silty sands and sand-silt mixtures.....	Fair to good.....	Poor to not suitable..
SC		Clayey sands and sand-clay mixtures...	Fair to good.....	Not suitable.....	
Fine-grained soils ( <i>more than 50 percent passing No. 200 sieve</i> ): Silts and clays ( <i>liquid limit of 50 or less</i> ).	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, and clayey silts of slight plasticity.	Fair to poor.....	Not suitable.....	
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, and lean clays.	Fair to poor.....	Not suitable.....	
	OL	Organic silts and organic clays having low plasticity.	Poor.....	Not suitable.....	
	Silts and clays ( <i>liquid limit greater than 50</i> ).	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, and elastic silts.	Poor.....	Not suitable.....
		CH	Inorganic clays having high plasticity and fat clays.	Poor to very poor...	Not suitable.....
		OH	Organic clays having medium to high plasticity and organic silts.	Poor to very poor...	Not suitable.....
Highly organic soils.....	Pt	Peat and other highly organic soils....	Not suitable.....	Not suitable.....	

<sup>1</sup> Based on information in The Unified Soil Classification System, Tech. Memo. No. 3-357. Ratings and ranges in test values are for guidance only. Design should be based on field survey and test of samples from construction site.

<sup>2</sup> Ratings are for subgrade and subbases for flexible pavement.

in soil-type base courses for flexible pavement. Sand may have to be added to improve the gradation or plasticity.

At many construction sites major variations in the soil and substratum may occur within the area of the proposed excavation, and several soil units may occur within a short distance. The soil map and profile descriptions, as well

as the data in this section, should be used in planning detailed surveys of soils at construction sites. By using the information in the soil survey reports, the soil engineer can concentrate on the most important soil units. A minimum number of soil samples, therefore, will be obtained for laboratory testing, and an adequate soil investigation can be made at a minimum cost.

*in Unified soil classification system*<sup>1</sup>

Value for embankments	Compaction: Characteristics and recommended equipment	Approximate range in A. A. S. H. O. maximum dry density <sup>3</sup>	Field (in place) CBR	Subgrade modulus k	Drainage characteristics	Comparable groups in A. A. S. H. O. classification
		<i>Lb./cu. ft.</i>		<i>Lb./sq. in./in.</i>		
Very stable; use in pervious shells of dikes and dams.	Good; use crawler-type tractor, pneumatic-tire roller, or steel-wheel roller.	125-135	60-80	300+	Excellent.....	A-1.
Reasonably stable; use in pervious shells of dikes and dams.	Same.....	115-125	25-60	300+	Excellent.....	A-1.
Reasonably stable; not particularly suited to shells, but may be used for impervious cores or blankets.	Good, but needs close control of moisture; use pneumatic-tire or sheepsfoot roller.	120-135	20-80	200-300+	Fair to practically impervious.	A-1 or A-2.
Fairly stable; may be used for impervious core.	Fair; use pneumatic-tire or sheepsfoot roller.	115-130	20-40	200-300	Poor to practically impervious.	A-2.
Very stable; may be used in pervious sections; slope protection required.	Good; use crawler-type tractor or pneumatic-tire roller.	110-130	20-40	200-300	Excellent.....	A-1.
Reasonably stable; may be used in dike section having flat slopes.	Same.....	100-120	10-25	200-300	Excellent.....	A-1 or A-3.
Fairly stable; not particularly suited to shells, but may be used for impervious cores or dikes.	Good, but needs close control of moisture; use pneumatic-tire or sheepsfoot roller.	110-125	10-40	200-300	Fair to practically impervious.	A-1, A-2, or A-4.
Fairly stable; use as impervious core for flood-control structures.	Fair; use pneumatic-tire roller or sheepsfoot roller.	105-125	10-20	200-300	Poor to practically impervious.	A-2, A-4, or A-6.
Poor stability; may be used for embankments if properly controlled.	Good to poor; close control of moisture is essential; use pneumatic-tire or sheepsfoot roller.	95-120	5-15	100-200	Fair to poor.....	A-4, A-5, or A-6.
Stable; use in impervious cores and blankets.	Fair to good; use pneumatic-tire or sheepsfoot roller.	95-120	5-15	100-200	Practically impervious.	A-4, A-6, or A-7.
Not suitable for embankments.....	Fair to poor; use sheepsfoot roller. <sup>4</sup>	80-100	4-8	100-200	Poor.....	A-4, A-5, A-6, or A-7.
Poor stability; use in core of hydraulic fill dam; not desirable in rolled fill construction.	Poor to very poor; use sheepsfoot roller. <sup>4</sup>	70-95	4-8	100-200	Fair to poor.....	A-5 or A-7.
Fair stability on flat slopes; use in thin cores, blankets, and dike sections of dams.	Fair to poor; use sheepsfoot roller. <sup>4</sup>	75-105	3-5	50-100	Practically impervious.	A-7.
Not suitable for embankments.....	Poor to very poor; use sheepsfoot roller. <sup>4</sup>	65-100	3-5	50-100	Practically impervious.	A-5 or A-7.
Not used in embankments, dams, or subgrades for pavements.....	.....	.....	.....	.....	Fair to poor.....	None.

<sup>3</sup> Determined in accordance with test designation: T 99-49, A. A. S. H. O.

<sup>4</sup> Pneumatic-tire rollers may be advisable, particularly when moisture content is higher than optimum.

TABLE 9.—List of soil mapping units and some characteristics significant to engineering

Map unit symbol	Soil name	Selected characteristics significant to engineering			
		Slope	Natural drainage	Depth to seasonally high water table	Soil material and type of deposit
Aa	Almo silt loam.....	Percent 0-2	Poor.....	Feet 0	Approximately 4 feet of predominantly silty materials on terraces and second bottoms; underlain by old mixed alluvium derived from loess and Coastal Plain materials; proportions of sand, silt, and clay in substratum vary.
Bb	Beechy silt loam.....	0-2	} Poor.....	0	From 2 to 10 feet of young mixed alluvium on stream bottoms, draws, and foot slopes; derived from loess and Coastal Plain materials; proportions of sand, silt, and clay vary considerably throughout the profile.
Ba	Beechy fine sandy loam.....	0-2			
Ca	Calloway silt loam: Gently sloping phase.....	2-5	} Somewhat poor....	1 1-2	These soils have developed on uplands in 4 to 5 feet of loess that overlies Coastal Plain sandy clays and clays (CL, CH, or MH; A-6 or A-7).
Cb	Eroded gently sloping phase..	2-5			
Cc	Cuthbert-Silerton soils: Sloping phases.....	5-8	} Good.....	20+	The Cuthbert soils have developed in Coastal Plain materials; the Silerton soils have developed in a mantle of loess that is 10 to 24 inches thick. The Cuthbert and Silerton soils overlie Coastal Plain sands and clays that generally occur in alternating layers; substrata contain a variable number of thin (1 to 6 inches) layers of ironstone.
Cd	Severely eroded sloping phases.	5-8			
Ce	Strongly sloping phases.....	8-12			
Cf	Severely eroded strongly sloping phases.	8-12			
Cg, Ck Ch, Cl	Moderately steep phases..... Severely eroded moderately steep phases.	12-25 12-25			
Dd	Dexter fine sandy loam: Eroded gently sloping phase..	2-5	} Good.....	10+	Approximately 4 feet of soil materials on second bottoms and terraces; developed from old mixed alluvium washed from loess and Coastal Plain materials; overlies old alluvium washed from Coastal Plain materials.
De, Df	Eroded sloping phase.....	5-8			
Da	Dexter fine sandy clay loam: Severely eroded gently sloping phase.	2-5			
Db, Dc	Severely eroded sloping phase.	5-8			
Dg, Dk	Dexter silt loam: Eroded gently sloping phase..	2-5			
Dh	Sloping phase.....	5-8			
DI, Dm	Dexter silty clay loam, severely eroded sloping phase.	5-8			
Dn	Dulac silt loam: Eroded gently sloping deep phase.	2-5			
Do	Sloping deep phase.....	5-8			
Dp	Eroded sloping deep phase..	5-8			
Dr	Strongly sloping deep phase..	8-12			
Ds	Dulac silty clay loam: Severely eroded gently sloping deep phase.	2-5	} Moderately good..	1 1-2	Upland soils developed in loess, 3½ to 6 feet deep, that overlies Coastal Plain sandy clays and clays (CL, CH, or MH; A-6 or A-7).
Dt	Severely eroded sloping deep phase.	5-8			
Du	Severely eroded strongly sloping deep phase.	8-12			
Dv, Dw	Dulac-Cuthbert soils: Severely eroded strongly sloping phases.	8-12	} Moderately good to good.	1 2 2 3 20+	These are complexes of upland soils; the Dulac soils have developed in a mantle of loess that is generally more than 20 inches thick; the Cuthbert soils have developed in Coastal Plain materials. The Dulac and Cuthbert soils overlie Coastal Plain sandy clays and clays (CL, CH, or MH; A-6 or A-7).
Dx, Dy	Moderately steep phases.....	12-25			

See footnotes at end of table.

TABLE 9.—List of soil mapping units and some characteristics significant to engineering—Continued

Map unit symbol	Soil name	Selected characteristics significant to engineering			
		Slope	Natural drainage	Depth to seasonally high water table	Soil material and type of deposit
		<i>Percent</i>		<i>Feet</i>	
Dz	Dulac and Tippah silt loams: Gently sloping phases.....	2-5	Moderately good..	1-2	These are complexes of Dulac and Tippah soils. The soils are described separately elsewhere in this table.
D1a	Eroded gently sloping phases..	2-5			
D1b	Sloping phases.....	5-8			
D1c	Eroded sloping phases.....	5-8			
D1f	Dulac and Tippah silty clay loams: Severely eroded gently sloping phases.	2-5			
D1g	Severely eroded sloping phases.	5-8			
D1d, D1e, D1h	Severely eroded strongly sloping phases.	8-12			
Fa, Fc	Freeland fine sandy loam, eroded gently sloping phase.	2-5			
Fb, Fd	Freeland fine sandy clay loam, severely eroded sloping phase.	5-8			
Fe	Freeland silt loam: Eroded gently sloping phase..	2-5			
Ff	Severely eroded gently sloping phase.	2-5			
Fg	Eroded sloping phase.....	5-8			
Fh	Severely eroded sloping phase.	5-8			
Fk	Severely eroded strongly sloping phase.	8-12			
	Gullied land:		Excessive.....	20+ 30+	The soils of the Cuthbert-Silerton complexes and the Lexington-Ruston complexes are described separately elsewhere in this table; from 10 to 70 percent of the surface area of these upland soils is occupied by gullies; most of the gullies are too deep to cross with light machinery.
Ga	Moderately gullied land: Cuthbert-Silerton materials.	5-35			
Gc	Lexington-Ruston materials.	5-35			
Gb	Severely gullied land: Cuthbert-Silerton materials.	5-35			
Gd	Lexington-Ruston materials.	5-35			
Ha	Hatchie silt loam, gently sloping phase.	2-5	Somewhat poor....	1-2	This soil is on terraces and second bottoms; it has developed in old mixed alluvium washed from Coastal Plain materials or in a thin layer of loess over old mixed alluvium.
Hb	Hymon fine sandy loam.....	0-2	Moderately good..	0 0-3	From 2 to 20 feet of young mixed alluvium on flood plains; derived from loess and Coastal Plain materials; the proportions of sand, silt, and clay vary considerably throughout the profile.
Hc	Hymon fine sandy loam, local alluvium phase.	2-5			
Hd	Hymon silt loam.....	0-2			
He	Hymon silt loam, local alluvium phase.	2-5			
Ia	Ina fine sandy loam.....	0-2			
Ib	Ina fine sandy loam, local alluvium phase.	2-5	Somewhat poor....	0 0-1½	From 2 to 20 feet of young mixed alluvium on flood plains; derived from loess and Coastal Plain materials; proportions of sand, silt, and clay vary considerably throughout the profile.
Ic	Ina loamy fine sand, local alluvium phase.	2-5			
Id	Ina silt loam.....	0-2			
Ie	Ina silt loam, local alluvium phase..	2-5			
La	Lexington silt loam: Eroded gently sloping phase...	2-5			
Lb	Sloping phase.....	5-8	Good.....	30+	These are upland soils developed in a thin mantle (24 to 45 inches) of loess underlain by sandy Coastal Plain materials (SM to SC, CL; A-4 to A-6, A-2).
Lc	Eroded sloping phase.....	5-8			
Lf	Lexington silty clay loam: Severely eroded gently sloping phase.	2-5			
Lg	Severely eroded sloping phase.	5-8			
Ld, Le, Lh	Severely eroded strongly sloping phase.	8-12			

See footnotes at end of table.

TABLE 9.—List of soil mapping units and some characteristics significant to engineering—Continued

Map unit symbol	Soil name	Selected characteristics significant to engineering				
		Slope	Natural drainage	Depth to seasonally high water table	Soil material and type of deposit	
		<i>Percent</i>		<i>Feet</i>		
Lk	Lexington-Ruston soils:					
Lm	Sloping phases.....	5-8	Good.....	30+	These are complexes of Lexington and Ruston soils. The soils are described separately elsewhere in this table.	
Ln	Eroded sloping phases.....	5-8				
Lo, Lp	Severely eroded sloping phases.....	5-8				
Lr	Strongly sloping phases.....	8-12				
Ls	Severely eroded strongly sloping phases.	8-12				
Lt	Moderately steep phases.....	12-25	Good to somewhat excessive.			
	Severely eroded moderately steep phases.	12-25				
Pa	Providence silt loam:					
Pb	Eroded gently sloping phase....	2-5	Moderately good..	30+		These soils have developed in the uplands in a thin layer (24 to 45 inches) of loess that overlies sandy Coastal Plain materials (SM to SC, CL; A-4 to A-6, A-2).
Pc	Severely eroded gently sloping phase.	2-5				
Pd	Sloping phase.....	5-8				
Pe	Eroded sloping phase.....	5-8				
Pf	Severely eroded sloping phase.....	5-8				
Ra	Severely eroded strongly sloping phase.	8-12				
Rb, Rc	Ruston fine sandy loam:		Good to somewhat excessive.	30+		
Rd	Sloping phase.....	5-8				
	Moderately steep phase.....	12-25				
Re	Ruston sandy clay loam:		Somewhat excessive.			
Rf, Rg	Severely eroded sloping phase.....	5-8				
Rh	Severely eroded moderately steep phase.	12-25				
Rk	Severely eroded steep phase....	25+				
	Sandy alluvial land.....	0-5	Poor to excessive..	0-3	This miscellaneous land type occurs on flood plains; it consists of more than 12 inches of sand (SM to SW; A-2 to A-3) and overlies young mixed material washed from loess and Coastal Plain materials; the proportions of sand, silt, and clay in the substratum vary considerably.	
Sa	Shannon silt loam, local alluvium phase.	0-5	Good.....	0-3	This soil occurs in small draws and depressions and on foot slopes; it consists of young mixed materials washed from soils that have formed in loess and sandy Coastal Plain materials; the proportions of sand, silt, and clay in the substratum vary considerably.	
Sb	Shubuta-Cuthbert loams:		Good to moderately good.	30+	These are complexes of upland soils; the Cuthbert soils are described elsewhere in this table; the Shubuta soils have developed in sandy clay of the Coastal Plain underlain by sands and clays. Many areas of the Shubuta soils have developed in and are underlain by plastic clays (CH, MH; A-7).	
Sc	Moderately steep phases.....	12-25				
Sd	Steep phases.....	25+				
Se	Shubuta-Cuthbert sandy clays:					
	Severely eroded sloping phases.....	5-8				
Sf	Severely eroded moderately steep phases.	12-25	Good to moderately good.	30+		
Sg	Shubuta-Cuthbert-Silerton soils:					
Sh	Sloping phases.....	5-12				
Sk	Severely eroded sloping phases.....	5-12				
	Moderately steep phases.....	12-25	Good.....	30+		
Sl	Severely eroded moderately steep phases.	12-25				
Sm	Shubuta-Ruston-Silerton soils:		Good.....	30+		
	Sloping phases.....	5-12				
	Severely eroded strongly sloping phases.	5-12				
Sn	Moderately steep phases.....	12+				
So	Severely eroded moderately steep phases.	12+				

See footnotes at end of table.

TABLE 9.—List of soil mapping units and some characteristics significant to engineering—Continued

Map unit symbol	Soil name	Selected characteristics significant to engineering				
		Slope	Natural drainage	Depth to seasonally high water table	Soil material and type of deposit	
Sp, Sr, Sx St Su Sv Sw	Silerton silt loam: Eroded gently sloping phase	<i>Percent</i> 2-5	Good to moderately good.	<i>Feet</i>  20+	These upland soils have developed in a thin mantle (10 to 24 inches) of loess that overlies Coastal Plain sandy clays or clays (CL, CH, MH; A-6, A-7).	
Sy Sz	Silerton silty clay loam: Sloping phase Eroded sloping phase Strongly sloping phase Eroded strongly sloping phase	5-8 5-8 8-12 8-12				
Ta Tb	Tippah silt loam: Gently sloping shallow phase Severely eroded gently sloping shallow phase	2-5 2-5	Moderately good	1-2		These upland soils have developed in a thin mantle (12 to 36 inches) of loess that overlies clay of the Coastal Plain (CH; A-7).
Tc Td	Severely eroded sloping phase Sloping shallow phase Severely eroded sloping shallow phase	5-12 5-12				

<sup>1</sup> Perched water table.

<sup>2</sup> Dulac only.

<sup>3</sup> Cuthbert only.

TABLE 10.—Estimated physical properties of the selected soils

Soils	Depth from surface	Classification		Permeability	Structure	Available water-supplying capacity	Suitability as source of topsoil
		Unified	A. A. S. H. O.				
Almo silt loam.....	<i>Inches</i> 0 to 18.....	ML or CL..	A-4.....	Moderate.....	Fine crumb to subangular blocky.	Good.....	Good.
	18 to 28..... 28+.....	CL or CH.. SC or CL..	A-6 or A-7. A-4 or A-6.	Slow..... Moderately slow.....	Angular blocky..... Angular blocky.....	Low..... Fair.....	Poor. Poor.
Beechy silt loam.....	0 to 4.....	ML.....	A-4.....	Moderate.....	Granular.....	High.....	Good.
	4+.....	SM or ML..	A-4.....	Moderate.....	Structureless.....	High.....	Good to fair.
Beechy fine sandy loam..	0 to 5.....	SM or ML..	A-2 or A-4.	Moderately rapid..	Granular.....	High.....	Good.
	5+.....	SM, ML, or CL.	A-4.....	Moderate.....	Structureless.....	High.....	Good to fair.
Calloway silt loam, gently sloping phase.	0 to 15.....	ML or CL..	A-4 or A-6.	Moderate.....	Fine crumb to medium blocky.	Good.....	Good to fair.
	15 to 36..... 36+.....	CL..... ML or CL..	A-6 or A-7. A-4 or A-6.	Slow..... Moderately slow.....	Subangular blocky..... Angular blocky.....	Low..... Fair.....	Fair. Poor.
Cuthbert very fine sandy loam.	0 to 4.....	ML.....	A-4.....	Moderate.....	Fine crumb.....	Good.....	Good.
	4 to 12.....	ML or CL..	A-4 or A-6.	Moderately slow..	Subangular blocky.	Fair.....	Fair.
	12+.....	CL, CH, or MH.	A-6 or A-7.	Moderately slow..	Massive.....	Fair.....	Poor.
Dexter fine sandy loam, eroded gently sloping phase.	0 to 7.....	SM or SC..	A-2 or A-4.	Moderately rapid..	Weak granular.....	Good.....	Good.
	7 to 30..... 30+.....	ML or CL.. SM or SC..	A-4 or A-6. A-2 or A-4.	Moderate..... Moderate.....	Subangular blocky. Subangular blocky.	Good..... Good.....	Good to fair. Fair.
Dexter silt loam, eroded gently sloping phase.	0 to 8.....	ML.....	A-4.....	Moderate.....	Fine crumb.....	Good.....	Good.
	8 to 30..... 30+.....	ML or CL.. SC or CL..	A-4 or A-6. A-4 or A-6.	Moderate..... Moderate.....	Medium blocky..... Medium blocky.....	Good..... Good.....	Good to fair. Fair.
Dulac silt loam, eroded gently sloping deep phase.	0 to 6.....	ML.....	A-4.....	Moderate.....	Fine crumb.....	Good.....	Good.
	6 to 24..... 24 to 42.....	CL or CH.. CL or CH..	A-6 or A-7. A-6 or A-7.	Moderate..... Slow.....	Subangular blocky. Angular blocky.....	Good..... Low.....	Good to fair. Poor.
	42+.....	ML or CL..	A-4 or A-6.	Moderately slow..	Angular blocky.....	Fair.....	Poor.
Freeland fine sandy loam, eroded gently sloping phase.	0 to 6.....	SM or ML..	A-2 or A-4.	Moderately rapid..	Weak granular.....	Good.....	Good.
	6 to 24..... 24 to 42.....	SC or CL.. CL.....	A-4 or A-6. A-6 or A-7.	Moderate..... Slow.....	Subangular blocky. Angular blocky.....	Good..... Low.....	Good to fair. Poor.
	42+.....	SM or ML..	A-4.....	Moderately slow..	Angular blocky.....	Fair.....	Poor.
Freeland silt loam, eroded gently sloping phase.	0 to 6.....	ML.....	A-4.....	Moderate.....	Fine crumb.....	Good.....	Good.
	6 to 24..... 24 to 42.....	ML or CL.. CL.....	A-6..... A-6 or A-7.	Moderate..... Slow.....	Subangular blocky. Angular blocky.....	Good..... Low.....	Good to fair. Poor.
	42+.....	ML or CL..	A-4 or A-6.	Moderately slow..	Angular blocky to massive.	Fair.....	Poor.
Hatchie silt loam, gently sloping phase.	0 to 6.....	ML.....	A-4.....	Moderate.....	Fine crumb.....	Good.....	Good.
	6 to 16..... 16 to 34.....	ML or CL.. CL.....	A-4 or A-6. A-6 or A-7.	Moderate..... Slow.....	Subangular blocky. Angular blocky.....	Good..... Low.....	Good to fair. Fair.
	34+.....	SM or ML..	A-4.....	Moderately slow..	Massive.....	Fair.....	Poor.
Hymon fine sandy loam..	0 to 6.....	SM or ML..	A-4.....	Moderately rapid..	Fine granular.....	Good.....	Good.
	6 to 20..... 20+.....	ML or CL.. SM or ML..	A-4 or A-6. A-2 or A-4.	Moderate..... Moderate.....	Fine granular..... Fine granular.....	High..... High.....	Good. Good.
Hymon silt loam.....	0 to 20.....	ML or CL..	A-4 or A-6.	Moderate.....	Weak granular.....	High.....	Good.
	20+.....	ML or CL..	A-4 or A-6.	Moderate.....	Weak granular.....	High.....	Good.
Ina fine sandy loam....	0 to 6.....	SM or ML..	A-2 or A-4.	Moderately rapid..	Fine granular.....	High.....	Good.
	6 to 12..... 12+.....	ML or CL.. SM or ML..	A-4 or A-6. A-2 or A-4.	Moderate..... Moderate.....	Fine granular..... Fine granular.....	High..... High.....	Good. Good to fair.
	12+.....	SM.....	A-2.....	Rapid.....	Structureless.....	Fair.....	Poor.
Ina loamy fine sand, local alluvium phase.	10 to 22.....	ML or CL..	A-4 or A-6.	Rapid.....	Structureless.....	High.....	Poor.
	22+.....	SM or ML..	A-2 or A-4.	Moderately rapid..	Structureless.....	High.....	Poor.
Ina silt loam.....	0 to 12.....	ML or CL..	A-4.....	Moderate.....	Fine granular.....	High.....	Good.
	12+.....	ML or CL..	A-4 or A-6.	Moderate.....	Fine granular.....	High.....	Good to fair.
Lexington silt loam, eroded gently sloping phase.	0 to 6.....	ML or CL..	A-4.....	Moderate.....	Fine crumb.....	Good.....	Good.
	6 to 34..... 34+.....	CL..... SM.....	A-6 or A-7. A-2.....	Moderate..... Moderate.....	Medium blocky..... Structureless.....	Good..... Good.....	Good to fair. Fair.
Providence silt loam, eroded gently sloping phase.	0 to 8.....	ML or CL..	A-4.....	Moderate.....	Fine crumb.....	Good.....	Good.
	8 to 26..... 26 to 40.....	CL..... ML or CL..	A-6 or A-7. A-4 or A-6.	Moderate..... Slow.....	Medium blocky..... Angular blocky.....	Good..... Low.....	Good to fair. Poor.
	40+.....	SM, ML, or CL.	A-4.....	Moderate.....	Angular blocky.....	Fair.....	Poor.
Ruston fine sandy loam, sloping phase.	0 to 16.....	SM, SC, or ML	A-2 or A-4.	Moderately rapid..	Fine crumb.....	Fair.....	Fair.
	16 to 26.....	SM, SC, or CL	A-2, A-4, or A-6.	Moderate.....	Medium blocky.....	Good.....	Fair.
	26+.....	SM or SC..	A-2 or A-4.	Moderately rapid..	Massive.....	Fair.....	Poor.

TABLE 10.—Estimated physical properties of the selected soils—Continued

Soils	Depth from surface	Classification		Permeability	Structure	Available water-supplying capacity	Suitability as source of topsoil
		Unified	A. A. S. H. O.				
Sandy alluvial land..... Shannon silt loam, local alluvium phase.	0 to 12+.....	SM.....	A-2.....	Very rapid.....	Structureless.....	Low.....	Not suitable.
	0 to 6.....	SM or ML..	A-2 or A-4..	Moderate.....	Weak fine granular.	Good.....	Good.
	6 to 42.....	ML or CL..	A-4.....	Moderate.....	Medium granular..	High.....	Good.
	0 to 7.....	SM, SC, or ML	A-2 or A-4..	Moderately rapid..	Fine granular to subangular blocky.	Fair.....	Fair.
Shubuta fine sandy loam..	7 to 14.....	CH or MH..	A-7.....	Moderately slow...	Medium subangular blocky.	Fair.....	Fair to poor.
	14+.....	CL, CH, or MH	A-6 or A-7..	Moderately slow...	Angular blocky....	Fair.....	Poor.
	0 to 4.....	ML or CL..	A-4.....	Moderate.....	Fine crumb.....	Good.....	Good.
Silerton silt loam, eroded gently sloping phase.	4 to 16.....	ML, CL, or CH	A-6 or A-7..	Moderate.....	Medium blocky....	Good.....	Good to fair.
	16 to 26.....	CH or MH..	A-7.....	Moderately slow...	Medium subangular blocky.	Fair.....	Fair.
	26+.....	CL, CH, or MH	A-7.....	Moderately slow...	.....	Fair.....	Poor.
	0 to 8.....	ML or CL..	A-4.....	Moderate.....	Medium granular..	Good.....	Good.
Tippah silt loam, gently sloping shallow phase.	8 to 18.....	CL or CH..	A-6 or A-7..	Moderate.....	Medium blocky....	Good.....	Fair.
	18 to 30.....	CL, CH, or MH	A-7.....	Moderately slow...	Medium angular blocky.	Low.....	Poor.
	30+.....	CH or MH..	A-7.....	Slow.....	.....	Fair.....	Poor.

**Glossary**

**Acidity.** The degree of acidity, or the reaction, of the soil expressed in pH values, or in words, as follows:

pH		pH	
Extremely acid.....	below 4.5	Mildly alkaline.....	7. 4-7. 8
Very strongly acid...	4. 5-5. 0	Moderately alkaline..	7. 9-8. 4
Strongly acid.....	5. 1-5. 5	Strongly alkaline.....	8. 5-9. 0
Medium acid.....	5. 6-6. 0	Very strongly alkaline.....	9. 1 and higher
Slightly acid.....	6. 1-6. 5		
Neutral.....	6. 6-7. 3		

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

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Bedrock.** The solid rock that underlies soils.

**Catena, soil.** A group of soils within one zonal region developed from similar parent material but differing in characteristics because of differences in relief or drainage.

**Chert.** Angular, flinty fragments, generally less than 3 inches in diameter, although coarse chert is between 3 and 10 inches in diameter.

**Clay.** Small mineral soil grains, less than 0.002 mm. (0.000079 in.) in diameter.

**Colluvium.** Deposits of rock fragments and soil material accumulated at the bases of slopes through the influence of gravity; includes creep and local wash and commonly consists of mixed material.

**Consistence, soil.** The attributes of soil material that are expressed by the degree and kind of cohesion and adhesion or by the resistance to deformation or rupture. Some terms used to describe consistence are *loose, compact, friable, firm, and plastic.*

*Loose:* Noncoherent.

*Compact:* Dense and firm but without cementation.

*Friable:* Readily ruptured and crushed with application of light to moderate force; nonplastic.

*Firm:* Resistant to forces that tend to produce rupture or deformation.

*Plastic:* Capable of being molded without rupture when wet; pliable but cohesive; puttylike.

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

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

**First bottom.** The normal flood plain of a stream; land along a stream that is subject to overflow.

**Genesis, soil.** Mode of origin of the soil, referring particularly to the processes responsible for the development of the solum (horizons A and B) from the parent material.

**Horizon, soil.** A layer of soil approximately parallel to the soil surface and having characteristics produced by soil-forming processes.

**Horizon A.** The upper part of the soil consisting of (1) one or more mineral horizons of maximum organic accumulation; or (2) surface or subsurface horizons that are lighter in color than the underlying horizon and that have lost clay minerals, iron, and aluminum with resultant concentration of the more resistant minerals; or (3) horizons belonging to both of these categories. This horizon is generally divided into two or more subhorizons of which the A<sub>0</sub> is not a part of the mineral soil but consists of an accumulation of organic debris on the surface. Other subhorizons have designations such as A<sub>1</sub> and A<sub>2</sub>.

**Horizon B.** The subsoil, or horizon of altered material characterized by (1) an accumulation of clay, iron, or aluminum, with accessory organic material; or (2) more or less blocky or prismatic structure together with other characteristics, such as stronger colors, unlike those of the A horizons or the underlying horizons of nearly unchanged material; or (3) characteristics of both these categories. Commonly, the lower limit of the B horizon corresponds with the lower limit of the solum.

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

- Horizon D.* Any stratum that underlies the C, or the B if no C is present, which is unlike the C, or unlike the material from which the solum has been formed.
- Mottling, soil.** Contrasting color patches that vary in number and size.
- Morphology, soil.** The physical constitution of the soil expressed in the kinds of horizons, their thickness and arrangement in the profile, and the texture, structure, porosity, consistence, and color of each horizon.
- Parent material.** The unconsolidated mass from which the soil profile develops.
- Parent rock.** The rock from which the parent materials of soils are formed.
- Permeability, soil.** That quality of the soil that enables it to transmit water or air.
- Productivity, soil.** The capability of a soil to produce a specified plant or sequence of plants under a given system of management.
- Profile, soil.** A vertical section of the soil through all its horizons and extending into the parent material.
- Reaction.** See Acidity.
- Relief.** The elevations or inequalities of a land surface, considered collectively.
- Residual material.** Soil material that has weathered or developed in place.
- Sand.** Small rock or mineral fragments that have diameters ranging from 0.05 mm. (0.002 in.) to 2.0 mm. (0.079 in.). The term sand is also applied to soils that contain 90 percent or more sand.
- Silt.** Small mineral soil grains ranging from 0.05 mm. (0.002 in.) to 0.002 mm. (0.000079 in.) in diameter. Includes all soil material that contains 80 percent or more silt and less than 12 percent clay.
- Soil.** The natural medium for the growth of land plants on the surface of the earth. It is composed of organic and mineral materials.
- Solum.** The upper part of the soil profile (horizons A and B) that lies above the parent material.
- Structure, soil.** The arrangement of the soil particles into lumps, granules, or other aggregates. Structure is described by grade (weak, moderate, or strong), that is, the distinctness and durability of the aggregates; by the size of the aggregates (very fine, fine, medium, coarse, or very coarse); and by their shape (platy, prismatic, columnar, blocky, granular, or crumb). A soil is described as structureless if there are no observable aggregates. Structureless soils may be massive (coherent) or single grain (noncoherent).
- Blocky, angular.* Aggregates are block shaped; they may have flat or rounded surfaces that join at sharp angles.
- Blocky, subangular.* Aggregates have some rounded and some plane surfaces; vertices are rounded.
- Columnar.* Aggregates are prismatic and are rounded at the upper ends.
- Crumb.* Generally soft, small, porous aggregates, irregular, but tending toward a spherical shape, as in the A<sub>1</sub> horizon of many soils. Crumb structure is closely related to granular structure.
- Granular.* Roughly spherical, firm, small aggregates that may be either hard or soft, but are generally more firm than crumb and without the distinct faces of blocky structure.
- Platy.* Soil particles are arranged around a plane, usually horizontal.
- Prismatic.* Soil particles are arranged around a vertical line; aggregates have flat vertical surfaces.
- Subsoil.** Technically, the B horizon; commonly, that part of the profile below plow depth.
- Substratum.** Material underlying the subsoil. (See also Horizon, soil.)
- Surface soil.** Technically, the A horizon; commonly, the upper 6 or 7 inches or the plow layer.
- Terrace (geologic).** An old alluvial plain that is generally nearly level. It occurs most commonly near a stream.
- Texture, soil.** Size of the individual particles making up the soil mass. The various soil separates are classified by size groups as follows: Sand, silt, and clay. A coarse-textured soil is one with a high content of sand; a fine-textured soil has a large proportion of clay.
- Topsoil.** Soil material used to topdress roadbanks, gardens, and lawns.
- Upland (geologic).** Land consisting of material unworked by water in recent geologic time and ordinarily lying at higher elevations than the alluvial plains or stream terraces.

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