

SOIL SURVEY

Lawrence County Tennessee



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

HOW TO USE THE SOIL SURVEY REPORT

THIS SURVEY of Lawrence County will help you plan 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 report, start with the index to map sheets in the back of this report. This is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. The sheets of the large map, if laid together, make a large photograph of the county. You can see woods, fields, roads, rivers, and many other landmarks on this map.

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

Suppose you have found on your farm an area marked with the symbol Ec. You learn the name of the soil this symbol represents by looking at the map legend. The symbol Ec identifies Ennis silt loam.

Learn about the soils on your farm

Ennis silt loam and all the other soils mapped are described in the section, Soil Descriptions. Soil scientists dug holes and examined surface soils and subsoils; measured slopes with a hand level; noted differences in growth of crops, weeds, brush, or trees; and, in fact, recorded all the things about the soils that they believed might affect their suitability for farming.

After they mapped and studied the soils, the scientists talked with farmers and others

about the use and management each soil should have, and then they placed it in a management group and in a land capability group. A management group consists of soils that are similar in crop suitability and management requirements. A capability group consists of soils that have similar needs, limitations, and risks of damage and make a similar response to management.

Ennis silt loam is in management group 1. Turn to the section, Use and Management of Soils, and read what is said about soils of group 1. You will want to study the table, which tells you how much you can expect to harvest from Ennis silt 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 or the county agricultural agent. Members of the staff of your State agricultural experiment station and others familiar with farming in your county will also be glad to help you.

Fieldwork for this survey was completed in 1952. Unless otherwise specifically indicated, all statements in this publication refer to conditions in Lawrence County at that time. This publication on the Soil Survey of Lawrence County, Tenn., is part of the technical assistance furnished to the Lawrence County Soil Conservation District.

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SOIL SURVEY OF LAWRENCE COUNTY, TENNESSEE

By JOSEPH R. OVERTON, in Charge, I. B. EPLEY, JAMES A. BLANTON, and D. D. WALKER, Tennessee Agricultural Experiment Station; and ROBERT WILDERMUTH, Soil Survey,¹ United States Department of Agriculture

Correlation by MAX J. EDWARDS, United States Department of Agriculture

United States Department of Agriculture in Cooperation With Tennessee Valley Authority and Tennessee Agricultural Experiment Station

General Nature of the Area

Lawrence County is mainly agricultural. Corn and cotton are the principal crops. The climate of the county is well suited to the growing of crops. Many of the soils, however, have steep slopes not suitable for cropping, and some of the soils are eroded.

Location and Extent

Lawrence County is in the southwestern part of central Tennessee (fig. 1). It is bordered on the east by Giles

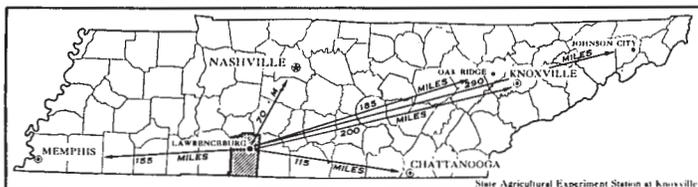


Figure 1.—Location of Lawrence County in Tennessee.

County, on the north by Maury and Lewis Counties, and on the west by Wayne County. On the south it is bordered by Lauderdale County, Ala. The total area is about 634 square miles, or 405,760 acres. Lawrenceburg, the county seat, is about 70 miles southwest of Nashville and about 20 miles north of the Alabama State line. It is roughly halfway between Memphis and Chattanooga.

Physiography, Relief, and Drainage

Lawrence County is within the Highland Rim section of the Interior Low Plateaus province (1).² It is assumed to be part of an old peneplain, which has been highly dissected in places.

The watersheds of the Buffalo River to the north, Shoal Creek to the southwest, and the Elk River to the southeast meet in this county. The topography is gentle at the heads of streams and more rugged farther down, particularly in the western and southern parts of the county. The slopes generally are southward. The altitudes range from about 1,000 feet along the northern boundary to about 800 feet along the Alabama line in the

southeast and to 540 feet in the southwest near Shoal Creek (?).

The broad uplands, the undissected part of the plateau, form a gently sloping to moderately steep plain that has many slight depressions. Here a dendritic drainage pattern has developed. Highly dissected uplands make up the other half of the plateau. In this part the ridges are narrow, the slopes are steep, and the rather narrow valleys are as much as 200 feet deep.

The first bottoms are generally narrow and nearly level. In places the slopes are so steep and close to the stream that there are no bottom lands. The second bottoms, or terraces, are gently sloping to moderately steep. In many places they do not have the flat topography typical of stream terraces. The soils are shallow in many places, and the depth to bedrock is only a few feet.

Lawrence County is drained by many streams and their tributaries. Among the larger ones are Anderson Creek, Bluewater Creek, Buffalo River, Shoal Creek, Sugar Creek, and Weakley Creek. Drainage is adequate in most of the county. It is slow in some areas, however, particularly in the northeast-central part, where the Buffalo River and Shoal Creek head.

Geology

This county is underlain by sedimentary rocks, mainly of Mississippian age. The formations range downward from St. Louis limestone to Leipers limestone or to slightly greater depths (?). The St. Louis formation is underlain by the Warsaw. As the St. Louis and Warsaw limestones are covered by a thick residual mantle of chert and clay, they seldom outcrop. Beneath these are Fort Payne chert, Ridgetop shale, and the New Providence formation. The Fort Payne chert outcrops in large, broad areas along the streams. The Fort Payne formation is very cherty although less cherty than the Fort Payne formation to the west (?). The soils formed from this limestone are cherty.

Ridgetop shale is exposed on the lower slopes along some of the larger creeks. It is a gray to green shale, in most places noncalcareous, and is associated with cherty limestone. Phosphatic limestone is exposed in some places, particularly on the creek bluffs. It has had little effect on the soils developed in the county.

Sand and gravel outliers of the Eutaw and Tuscaloosa formations occur at or near the surface, especially in the western part of the county (4). These have had little effect on the soils.

¹ Fieldwork for this survey was done when Soil Survey was part of the Bureau of Plant Industry, Soils, and Agricultural Engineering. Soil Survey was transferred to the Soil Conservation Service on November 15, 1952.

² Italic numbers in parentheses refer to Literature Cited, p. 61.

In general, the Pembroke, Decatur, and Bewleyville soils have formed from weathered materials of the St. Louis and Warsaw formations. The Mountview and Dickson soils have formed from weathered materials of the Warsaw and Fort Payne formations. The Bodine soils have formed chiefly from materials weathered from Fort Payne chert, and the Sulphura soils, from weathered Ridgetop shale. The light-colored Baxter soils have formed from materials weathered from Fort Payne chert and from the New Providence and Ridgetop shale formations.

A thin mantle of silt, or loess, as much as 42 inches thick, covers much of the uplands and terraces. This silt is part of the parent material of some of the soils, including those developed on colluvial slopes.

Climate

Lawrence County has a humid, continental climate (10). Table 1, compiled from records at Ashwood Station, Maury County, Tenn., gives monthly, seasonal, and annual temperatures and precipitation typical for this county. This weather station was the only one in the area that had complete weather information representative of this county.

The climate is temperate. Severe weather and high winds seldom occur. Summers are hot and winters are mild. Rainfall is abundant, and most of it comes late in winter and in spring. Droughts of 4 to 6 weeks are common in summer, but some summers are free of drought. The driest season is in midfall. Snowfall is light and melts in a day or so. The ground seldom freezes to a depth of more than 2 inches.

The average frost-free period is from April 12 to October 21, an average growing season of 192 days. Air drainage is good on the uplands.

Water Supply

Throughout the county, water is obtained from springs and wells dug into the residual cover of the Mississippian formation (7). The water is generally of good quality.

There are many springs in the county. Hope Spring, the largest, supplies water to Lawrenceburg, and a smaller one supplies water to Iron City. There is another large spring at the head of Spring Creek, and good-sized springs issue from most of the exposed formations.

In many valleys, springs and creeks supply enough water for domestic use. In others, however, small intermittent streams are not a dependable source of water, and wells are used. In the uplands, wells and ponds provide the water for large areas. Deeper, drilled wells are often required because some dug wells fail to yield water during dry spells. In these wells the depth to water and the amount of water vary. The water in most of these wells is obtained near the base of the cherty limestone residuum that overlies the Mississippian formation.

In recent years there has been an improvement in the location, layout, and construction of farm ponds. They are used increasingly for fishing and recreation. Many of the ponds, however, are inadequately protected from livestock. They are therefore muddy much of the year because of the trampling of livestock. A number of ponds that are not well constructed go dry during summer.

TABLE 1.—*Temperature and precipitation at Ashwood Station, Maury County, Tenn.*

(Elevation, 725 feet)

Month	Temperature ¹			Precipitation ²			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1901)	Wettest year (1950)	Average snowfall
	° F.	° F.	° F.	Inches	Inches	Inches	Inches
December	42.3	76	0	4.59	3.87	2.76	1.4
January	40.8	77	-17	5.14	3.97	16.14	3.3
February	43.1	78	-11	4.90	1.99	8.85	1.7
Winter	42.1	78	-17	14.63	9.83	27.75	6.4
March	50.2	84	7	5.88	1.66	6.35	1.1
April	59.3	89	15	4.17	4.50	1.51	(³)
May	66.8	95	33	4.37	1.60	3.80	0
Spring	58.8	95	7	14.42	7.76	11.66	1.1
June	75.3	105	43	3.71	2.30	4.50	0
July	78.1	106	47	3.80	2.00	3.30	0
August	76.8	102	44	4.00	5.15	8.17	0
Summer	76.7	106	43	11.51	9.45	15.97	0
September	71.8	101	32	3.17	3.57	3.70	0
October	60.9	93	20	2.89	.95	.57	(³)
November	49.5	83	-4	4.00	.87	7.37	.4
Fall	60.7	101	-4	10.06	5.39	11.64	.4
Year	59.6	106	-17	50.62	32.43	67.02	7.9

¹ Average temperature based on an 83-year record, through 1955; highest temperature on a 21-year record, lowest temperature on a 22-year record, through 1952.

² Average precipitation based on an 82-year record, through 1954; wettest and driest years based on an 82-year record, in the period 1873-1954; snowfall based on a 21-year record, through 1952.

³ Trace.

Many of the soils on the first bottoms and terraces are suitable for irrigation. Water is available from the larger streams, but the quantity may not be sufficient to meet the needs.

Vegetation

Lawrence County is in the eastern hardwood forest area (3). The original vegetation consisted mainly of various kinds of beech, chestnut, elm, gum, hickory, maple, and oak trees, and some poplar and holly trees. Mixed with the hardwoods were some shortleaf pines and cedars.

Forest products have provided a source of income since the time railroads were built in this county. About 25 percent of the land was cleared before 1905 (6). In 1954, however, only about 0.9 percent of the value of all farm products sold in the county was from forest products, although a large part of the county is in forest. Second-growth trees, mainly gums, hickories, oaks, and some beech, cucumber, and poplar trees, make up the present forest.

Land that has been cleared is generally used for crops and pastures, but some is idle. Idle and abandoned land

and poorly managed pastures are mostly overgrown with briars, broomsedge, wild grasses, weeds, and persimmon and sassafras trees. A few areas have been planted to loblolly and shortleaf pines.

Organization and Population

Lawrence County was established in 1817 (2), and the county seat was selected in 1819. The first settlement, near the old Pennington millsite, was made on the Buffalo River in 1815. By 1817, the first watermill, the first school, and the first cotton gin had been built. The early settlers were of English descent and came from States to the east. Some of the settlers had military grants; others had occupants' grants. About 1870, the German Catholic Homestead Association bought land and settled German immigrants on about 25,000 acres.

In 1950 the population of Lawrence County was 28,818. Lawrenceburg, the county seat and principal business center, had a population of 5,442.

Transportation and Markets

The principal market for farm products in this county is Lawrenceburg. Other important trading centers are Ethridge, Leoma, Loretto, St. Joseph, and Summertown. The Louisville and Nashville Railroad passes through all of these communities, and all are reached by a Federal highway. There are also several county and State blacktop roads. All-weather chert roads service most localities, but some of these have fords that at times are impassable. In 1950, 1,840 farms were 0.2 mile or less from the nearest all-weather road, and 1,093 farms were 1 mile or more.

In 1952, there were 11 dealers who sold grain and seed and 1 cream buyer in the county. In addition there were 5 milk markets, 1 stockyard, 14 cotton gins, 3 bonded cotton warehouses, and 3 produce markets. A market for the sale of truck produce is held 1 day a week.³

Community Facilities

Adequate schools are provided throughout the county. Some of the elementary schools are small, but many have recently been consolidated. School buses provide transportation for the rural students who attend the elementary schools and the three high schools in the county. Two communities have church schools, and most of the communities have churches. Most parts of the county have rural mail service. A few communities have community centers.

Agriculture

Agriculture is the main occupation in the county, and cotton provides more than half of the farm income. Some income is derived from livestock and livestock products, and increasing numbers of dairy and beef cattle are being raised. The more outstanding features of the agriculture in this county are discussed on the following pages. The statistics used are from reports compiled by the United States Bureau of the Census.

³ 1952 figures supplied by county agent.

Land Use

In 1954, about 74.2 percent of the county, or 301,083 acres, was in farms. Of this, about 53 percent was cropland, 35 percent was woodland, and 8 percent was cropland lying idle. A total of 31 percent, including some cropland and some woodland, was pastured. The acreage of land in farms, by use, is listed as follows:

	<i>Acres</i>
Cropland (total).....	159,355
Harvested.....	94,696
Used only for pasture.....	35,505
Not harvested or pastured.....	29,154
Woodland (total).....	106,746
Pastured.....	34,614
Not pastured.....	72,132
Other land pastured.....	24,097
Land pastured (total).....	94,216
Other land (house lots, roads, wasteland, etc.).....	10,885

Types of Farms

In 1954, 33 percent of the farms in the county were miscellaneous and unclassified. The rest are listed by type of farm as follows:

	<i>Number</i>
Field crops other than vegetable and fruit and nut....	1,537
Cash grain.....	70
Cotton.....	1,412
Other field crop.....	55
Vegetable.....	10
Fruit and nut.....	10
Dairy.....	136
Poultry.....	5
Livestock other than dairy and poultry.....	107
General.....	328
Primarily crop.....	132
Primarily livestock.....	5
Crop and livestock.....	191

Crops

Many different crops are grown in this county. Table 2 shows the acreage of the principal crops and the number of fruit and nut trees in the county for specified years.

Corn.—Corn is grown on nearly all of the farms and occupies a larger acreage than any other crop. Most of the soils are used for this crop. The corn is generally planted in April or May, but some is planted in June. The seed used is often saved by farmers from fields of open-pollinated corn. As a rule a complete fertilizer is applied at the rate of 100 to 400 pounds per acre, and on some farms the corn is sidedressed with nitrogen. A green-manure crop is seldom turned under before the corn is planted. Most of the crop is harvested for grain and is fed on the farms where it is grown. Harvesting is usually by hand, but the use of machine pickers is increasing.

Cotton.—Cotton is still the main cash crop, but the acreage has decreased in recent years. In 1954, cotton was grown on about 14.2 percent of the total cropland, as compared to 18.5 percent in 1949. This crop is grown largely on Mountview and Dickson soils. Commercial fertilizers are generally used and are applied at the rate of 200 to 500 pounds per acre. On some farms cotton is sidedressed with ammonium nitrate, nitrate of soda, or anhydrous ammonia.

Generally, cotton is planted the latter part of April or early in May. Many farmers save seed instead of buying it, and much seed of unimproved varieties is planted.

Most of the crop is ginned locally. Many farmers sell all or part of the cotton as it is ginned.

Small grains.—Wheat is grown mainly on gently sloping and sloping Decatur, Dickson, Mountview, and Pembroke soils. Between 200 and 300 pounds per acre of a complete fertilizer is generally applied at seeding time. On some farms the wheat is topdressed in the spring with ammonium nitrate. On nearly all of the soils, wheat would be benefited by additions of phosphate.

The acreage in winter oats is increasing, and a small acreage is seeded to spring oats each year. Most of the crop is used locally for feed, but some is used for grazing and winter cover. Generally, 200 to 300 pounds per acre

a complete fertilizer, 20-percent phosphate, or basic slag is sometimes applied at seeding time. Fertilizer is not always used.

Barley is grown chiefly on Bewleyville, Decatur, and Pembroke soils, but some is grown on Mountview soils. The acreage used for this crop has nearly doubled in the past few years. Much of the barley is seeded with crimson clover on well-prepared soils. Moderate applications of fertilizer are used. Usually this crop is grazed until early in April, and then a seed crop is allowed to mature. The crop is harvested by combine in June. Much of it is sold for seed.

Soybeans.—Soybeans are grown on most of the gently sloping and sloping soils. They are grown mainly for hay or seed, but some of the crop is sold to oilmills, and some is used locally for seed. The beans are generally broadcast between April and July. Little of the crop is cultivated. Small to moderate applications of a complete fertilizer are usually made. On some farms basic slag is applied at the rate of 400 to 800 pounds per acre. Combines are used to harvest the seed crop.

Other hay crops.—Alfalfa is grown on a few farms. On some soils the stands are short lived. Alfalfa is often planted following a crop of small grain that has been threshed or combined.

Lespedeza is grown widely for hay and pasture. It is sown in spring, and little or no fertilizer is used. Sometimes lespedeza is sown early in spring in wheat or some other small grain. In some places redtop is sown along with the lespedeza. As a rule common (annual) lespedeza is seeded, but some sericea lespedeza is used. On some farms the crop is allowed to reseed itself. On others lespedeza is replanted or the soil is idle for several years.

Of the legumes grown for hay, soybeans were cut from 2,600 acres and cowpeas from 195 acres. These crops were mainly grown alone, but to some extent they were grown with other crops. Although most of the cowpeas planted were used for forage and hay, on 15 farms 37 acres of cowpeas was reported plowed under for green manure.

Sorghum, mostly used for forage or cut for silage, was reported planted on 627 farms. On some farms sorghum was grown for sirup to be sold or used at home.

Field seed crops.—In 1954, of the acreage used for field seed crops, 964 acres were in crimson clover grown for seed; 386 acres in lespedeza; 119 acres in fescue; and the rest in miscellaneous seeds. Crimson clover, grown alone or with barley, is seeded early in fall for seed, pasture, or winter cover, or as green manure.

Tobacco.—Tobacco was grown on 418 farms in 1954. Dark-fired tobacco was grown on 22 acres, and Burley tobacco, on 243 acres. A total of 288,839 pounds of tobacco was harvested in 1954, a decrease of 307,031 pounds from that harvested in 1949. Most of the tobacco is grown in the northern part of the county. Moderate to large applications of fertilizer are generally used on this crop. Barnyard manure, winter cover crops, and green-manure crops are also used to improve the yield of tobacco.

Truck crops.—A few farms grow sweetpotatoes for sale, but on most farms Irish and sweetpotatoes are grown mainly for home use. Other vegetables were reported grown on 2,999 farms. Some of these were sold, but most were used on the farm. The growing of strawberries and okra was stimulated when a processing plant was established in Lawrenceburg. In 1954, strawberries were reported sold from 197 farms, and 340 acres was used for

TABLE 2.—Acreage of the principal crops and number of fruit and nut trees of bearing age

Crops	1929	1939	1949	1954
	Acres	Acres	Acres	Acres
Corn for all purposes.....	47, 671	47, 375	43, 809	38, 984
Cotton.....	32, 573	22, 198	35, 109	22, 549
Small grains threshed or combined:				
Wheat.....	2, 477	2, 260	3, 987	4, 814
Oats.....	322	684	1, 848	4, 701
Rye.....	635	926	2, 112	3, 169
Barley.....	(¹)	11	918	1, 569
Soybeans:				
Grown alone.....	4, 049	5, 742	3, 719	3, 610
Grown with other crops...	129	40	132	44
Hay:				
Alfalfa.....	183	324	1, 292	554
Clover and timothy, alone or mixed.....	768	419	327	197
Lespedeza.....	(¹)	10, 753	10, 331	6, 389
Legumes.....	6, 240	6, 377	3, 183	2, 795
Small grains.....	1, 373	809	945	2, 125
Other.....	2, 654	1, 455	1, 846	1, 127
Sorghum for all purposes except sirup.....	436	407	442	1, 452
Tobacco.....	333	188	289	275
Irish potatoes.....	585	818	² 208	³ 87
Sweetpotatoes.....	869	749	² 331	³ 244
	Number ⁴	Number ⁴	Number ⁴	Number ⁵
Apple trees.....	32, 808	23, 211	25, 101	9, 435
Peach trees.....	28, 838	30, 837	20, 164	8, 089
Pecan trees.....	330	102	204	29

¹ Not reported.

² Does not include acres for farms with less than 15 bushels harvested.

³ Does not include acres for farms with less than 20 bushels harvested.

⁴ One year later than year given at head of column.

⁵ Does not include data for farms with less than 20 trees.

of a complete fertilizer is applied. Sometimes the oats are topdressed with nitrogen in spring.

Rye, seeded alone or with vetch, has become an important crop. Combines are used in spring to harvest the large acreage of rye and of rye and vetch grown for seed. Rye is also grown alone or in combination with vetch as a winter cover crop and as green manure where corn or cotton is to be grown. The crop is seeded in fall on prepared soil, and small to moderate applications of fertilizer are used. Most of the seed is sold locally, but some is shipped out of the county. Between August and November the seed is broadcast or drilled in the middles between the rows of cotton or corn. Between 100 and 200 pounds of

the crop. Okra was reported grown on 149 farms and on 186 acres.

Tree fruits.—Most farms produce some fruit for home use. The fruits most commonly grown are apples, cherries, grapes, peaches, pears, and plums. There are a few commercial apple orchards.

Livestock and Livestock Products

Livestock or livestock products provided a major source of income on 248 farms in 1954. The value of livestock products was 29.4 percent of all farm products sold during the year. Table 3 gives the number of livestock on the farms for various years.

The dairy herds are generally small, but the number of herds is increasing. Most of the dairy products are used on the farm or are sold locally. The dairy cattle are mostly Jerseys and grade Jerseys. The beef cattle are mainly Herefords, but there are some herds of Angus and Shorthorn.

Hogs are raised on most farms, mainly for home use, but some are sold. In 1954, 9,717 hogs and pigs were sold alive. On farms where corn is plentiful, hogs are raised for market; on farms where corn is limited, pigs are sold at weaning time.

The number of sheep raised in the county has never been large, although it has increased steadily. The breeds raised are mostly Hampshire and Southdown.

Poultry and poultry products provided some income for 1,173 farms in 1954 and were a major source of income on 5 farms. There were 263,932 dozens of chicken eggs and 94,145 chickens sold. Some eggs were sold for hatching purposes. The most common breeds of chickens are White Leghorn, Plymouth Rock, Rhode Island Red, and New Hampshire. Turkeys, ducks, geese, and other poultry and their eggs were reported sold from 45 farms.

TABLE 3.—*Livestock on farms*

Livestock	1930	1940	1950	1954
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
Horses and mules.....	7, 139	¹ 6, 778	5, 428	2, 949
Cattle and calves.....	9, 778	¹ 10, 798	16, 506	19, 818
Hogs and pigs.....	7, 580	² 9, 974	14, 128	11, 444
Sheep and lambs.....	860	³ 655	1, 518	1, 568
Chickens.....	¹ 109, 872	² 107, 636	² 111, 034	² 114, 150
Turkeys raised.....	⁴ 68	⁴ 102	⁴ 912	3, 704

¹ 3 months old and over.

² 4 months old and over.

³ 6 months old and over.

⁴ 1 year earlier than date given at head of column.

Pastures

About 31 percent of the farmland, or 94,216 acres, was pastured in 1954. Of this, about 37 percent was pastured woodland. Most of the soils used for permanent pasture are not well suited to cultivated crops. In recent years, however, well-managed, permanent pastures have been established on the better soils. Generally, permanent pastures are poorly managed. On some farms, however, pastures are well managed; fertilizer and lime are used, overgrazing is not allowed, and weeds are controlled. Lespedeza is widely used in pastures, as are orchardgrass, tall fescue, and Ladino and white clovers. Much of the

grazing is on rotated pastures, but on many farms wild grasses and woodlands are grazed. The grazing season on permanent pasture is from about April 15 to November 15.

Tenure and Size of Farms

In 1954 there were 3,200 farms in the county. Of these, owners operated about 56.3 percent, and tenants, about 23.8 percent. Part owners and managers operated about 19.9 percent. Owners farmed 158,722 acres; tenants, 55,286 acres; and part owners and managers, 87,075 acres.

The number of tenants decreased from 1,148 in 1950 to 762 in 1954. Part of the decrease is related to an increase in the number of part owners. Most tenancy is on a share-crop basis. Usually the tenant provides power and equipment and retains three-fourths of the cotton crop and two-thirds of other crops. Expenses for seed and fertilizer are shared. Some land is rented for cash and some for a stated amount of produce.

The farms are not large. In 1954 the average-size farm was 94.1 acres. This is a slight increase from 1950, when the average-size farm was 85.1 acres.

Farm Improvements and Mechanical Equipment

In 1954, 2,833 farms had electricity and 505 farms had telephones. A total of 1,025 farms had piped running water, and 448 farms had home freezers.

On most farms tractors have replaced work animals, although a few horses and mules are kept for use on small farms or for use on rough land. In 1954, there was a greater number of mules than horses. Most of the feed for the work animals is grown on the farm.

In 1954, there were 1,620 tractors on 1,483 farms; 1,204 motortrucks on 1,132 farms; and 1,529 automobiles on 1,415 farms. Other mechanical equipment included 258 grain combines on 247 farms; 64 cornpickers on 64 farms; 106 pickup hay balers on 106 farms; and 12 field forage harvesters on 12 farms.

How a Soil Survey Is Made

The scientist who makes a soil survey examines the soils in the field, classifies them, and sketches their boundaries on an aerial photograph.

FIELD STUDY

The soil surveyor bores and digs many holes to see what the soils are like. The holes are not spaced in a regular pattern but are located according to the lay of the land. As a rule they are not more than a quarter of a mile apart, and sometimes they are much closer. These observations are supplemented by studies of roadcuts and similar excavations. In most soils there are several distinct layers, called *horizons*, which are collectively known as the soil *profile*. Each horizon is studied to see how it differs from others in the profile and to learn the things about this soil that influence its capacity to support plant growth.

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 rust color 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 larger 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.

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 of the material from which the soil has developed; 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, in the Decatur series there are two soil types, subdivided into phases, as follows:

Series	Type	Phase
Decatur-----	{ Silt loam-----	Eroded gently sloping phase.
		Eroded sloping phase.
	{ Silty clay loam-----	Severely eroded gently sloping phase.
		Severely eroded sloping phase.

Soil series.—Soils similar in kind, thickness, and arrangement of soil layers are normally designated as a soil series. In a given area, however, it frequently happens that a soil series is represented by only one soil type. Each series is named for the place near which it was first mapped.

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

Soil phase.—Because of differences other than those of kind, thickness, and arrangement of layers, some soil types are divided into two or more phases. 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 is not subdivided) is the unit shown on the soil map. It is the unit that has the narrowest range of characteristics. Use and soil management practices, therefore, can be specified in more detail than for soil series or broader groups that contain more variation.

Soil variant.—A taxonomic unit closely related to another taxonomic unit, say a soil series, but having at least one differentiating characteristic at the series level. Soil variants are really separate soil series but of too small known extent to justify establishing a new series. Lawrence silt loam, brown variant, is an example of a soil variant mapped in Lawrence County.

Miscellaneous land types.—These are areas of land that have little or no true soil. Rockland is a miscellaneous land type mapped in Lawrence County.

Soils of Lawrence County

Most of the important differences among the soils of Lawrence County are related to differences in parent material, age, and drainage. On most of the farms several soils occur, each with different characteristics.

The soils in the county are mainly friable cherty silt loams or silt loams, but they range in texture and consistence from very friable gritty cherty silt loam to compact clay. The soils occupy nearly level to steep slopes. About 67 percent have slopes of less than 12 percent, and about 15 percent have slopes of more than 25 percent. Nearly 50 percent of the acreage is seriously eroded, and less than 4 percent is severely eroded. The content of chert in many of the soils makes tillage difficult.

Soil Series and Their Relations

The soils of the county have been placed in 24 series and 3 miscellaneous land types. The series have been grouped in table 4, according to geographical position, so that the relationship of the soils can be better understood.

The groups are—

1. Soils of the uplands.
2. Soils of stream terraces and old colluvial slopes.
3. Soils of bottom lands and young alluvial slopes.

Soils of the uplands

The soils of the uplands occupy areas above stream valleys. They have formed in place, chiefly from a thin, and in places discontinuous, layer of loess over residuum derived from a variety of limestones. The chief kinds of limestone are very cherty limestone, cherty limestone, and high-grade, chert-free limestone. The less sloping of these upland soils are older and have more distinct layers than the soils formed on colluvial slopes, stream terraces, and bottom lands.

The Bewleyville, Cookeville, Dickson, Guthrie, Lawrence, Mountview, and Sango soils have developed from a thin layer of loess over residuum from cherty limestone. Their upper layers are free of chert, and mechanical analyses indicate that the surface layers are much higher in silt than the lower layers. The Bewleyville, Cookeville, and Mountview soils are all well drained. The Cookeville are somewhat shallow over the cherty material. The subsoils of the Bewleyville and the Cookeville soils are reddish, whereas those of the Mountview are yellowish brown. The Dickson, Guthrie, Lawrence, and Sango soils are on the smoother parts of the uplands. Their internal drainage is notably impaired, and all have a pan (fragipan). The Dickson soils are the best drained of the group, and the Guthrie are the poorest drained.

The Decatur and Pembroke soils have formed in residuum from chert-free limestone. They have a brown surface soil and a red subsoil. The entire solum of the Decatur soils has formed in limestone residuum, whereas the surface layer of the Pembroke soils consists of loesslike material. The Baxter and Bodine soils have developed in residuum from cherty limestone. They are cherty and

TABLE 4.—*Distinguishing characteristics of the soil series*

SOILS OF THE UPLANDS

Soil series	Parent material	Natural drainage	Slope range	Surface soil	Subsoil
Baxter.....	Residual material chiefly from— Cherty limestone.....	Good.....	<i>Percent</i> 2-65	Pale-brown or light brownish-gray to yellowish-red cherty silt loam.	Dark-red to yellowish-red firm cherty silty clay loam.
Bodine.....	Cherty limestone.....	Somewhat excessive.	2-65	Gray to light yellowish-brown, cherty or fine cherty silt loam.	Pale-brown to yellowish-brown friable cherty and gritty silty clay loam; some mottles in lower part.
Cookeville.....	Cherty limestone.....	Good.....	2-12	Light yellowish-brown or dark-brown and yellowish-red to dark-red silt loam.	Brown, yellowish-red to dark-red firm cherty silty clay loam.
Decatur.....	High-grade limestone.....	Good.....	2-12	Brown or reddish-brown to dusky-red silty clay loam.	Light reddish-brown or red to very dusky red firm silty clay to clay.
Sulphura.....	Noncalcareous shale and cherty limestone.	Excessive.....	12-65	Pale-brown to dark-brown cherty silt loam.	Light-green noncalcareous shale, mottled and stained with black and yellow.
Bewleyville.....	Thin loess over— Cherty limestone residuum.	Good.....	2-5	Light yellowish-brown to dark-brown silt loam.	Strong-brown or yellowish-red to red firm cherty silty clay loam.
Dickson.....	Cherty limestone residuum.	Moderately good.	2-5	Brownish-gray to dark-brown silt loam.	Yellow, yellowish-brown, or strong-brown friable silty clay loam; some mottles; pan at depth of 22 inches.
Guthrie.....	Cherty limestone residuum.	Poor.....	0-3	Light-gray or gray silt loam; many faint fine mottles.	Dark-gray compact silty clay to clay (pan layer), mottled with pale yellow and rust.
Lawrence.....	Cherty limestone residuum.	Somewhat poor..	0-5	Gray to pale-yellow silt loam..	Pale-yellow friable to firm silty clay loam; mottles of light gray and rust brown; pan at depth of 16 inches.
Mountview.....	Cherty limestone residuum.	Good.....	2-12	Pale-yellow or grayish-brown to yellowish-brown silt loam.	Light-brown to yellowish-brown friable silty clay loam or silt loam.
Pembroke.....	High-grade limestone residuum.	Good.....	0-5	Dark-brown to dark reddish-brown silt loam.	Reddish-brown to dark reddish-brown friable to firm silty clay loam.
Sango.....	Cherty limestone residuum.	Somewhat poor to moderately good.	0-5	Light-gray to light yellowish-brown silt loam.	Olive-yellow to light yellowish-brown friable to firm silty clay loam; mottled with light gray and rust in lower part; pan at depth of 20 inches.

SOILS OF STREAM TERRACES AND OLD COLLUVIAL SLOPES

Captina.....	Old general alluvium chiefly from— Limestone and silt.....	Moderate.....	2-12	Brownish-gray to yellowish-brown silt loam.	Yellowish-brown friable silty clay loam; some mottles in lower part; pan at a depth of 26 inches.
Etowah.....	Limestone and silt.....	Good.....	2-12	Grayish-brown to red silt loam.	Strong-brown to dark-brown or red firm silty clay loam.
Humphreys.....	Cherty limestone and silt.	Good.....	0-5	Grayish-brown to dark-brown silt loam.	Yellowish-brown to dark-brown friable silty clay loam.
Robertsville.....	Limestone and silt.....	Poor.....	0-3	Light-gray to gray silt loam..	Light-gray friable silt loam; mottled with yellow and rust; pan layer at a depth of 18 inches.
Taft.....	Limestone and silt.....	Somewhat poor..	0-3	Light-gray to yellow silt loam, mottled with rust.	Yellow to light yellowish-brown friable silt loam; spotted with gray and highly mottled in lower part; pan at a depth of 18 inches.
Minvale.....	Old local alluvium chiefly from— Cherty limestone.....	Good.....	2-25	Brown and dark-brown to dark-red cherty silt loam.	Dark-brown to dark-red firm cherty silty clay loam.
Pace.....	Cherty limestone.....	Moderate to good.	2-25	Grayish-brown to yellowish-brown or brown silty clay loam and cherty silt loam to silt loam.	Yellow to yellowish-brown or brown friable cherty silty clay loam; mottled at a depth of 20 inches.

TABLE 4.—*Distinguishing characteristics of the soil series*—Continued

SOILS OF BOTTOM LANDS AND YOUNG ALLUVIAL SLOPES

Soil series	Parent material	Natural drainage	Slope Range	Surface soil	Subsoil
Ennis.....	Young general alluvium chiefly from— Cherty limestone and loess.	Good.....	Percent 0-5	Grayish-brown to very dark brown silt loam and cherty silt loam.	Brown to dark-brown or yellowish-brown friable silt loam to cherty silt loam, faintly spotted with gray in lower part.
Lee.....	Cherty limestone and loess.	Poor.....	0-2	Light-gray to dark-gray silt loam or loam.	White to light-gray friable silt loam, mottled with pale yellow and rust.
Lobelville....	Cherty limestone and loess.	Somewhat poor to moderate.	0-5	Brownish-gray to brown silt loam or cherty silt loam; light-gray mottles.	Mottled gray, brown, and yellow friable silt loam or cherty silt loam.
Emory.....	Young local alluvium chiefly from— Chert-free limestone....	Good.....	0-5	Brown to very dark brown silt loam.	Dark reddish-brown to dark-brown friable silt loam.
Greendale....	Cherty limestone and silt.	Moderate to good.	0-5	Light grayish-brown to dark-brown cherty silt loam or silt loam.	Yellowish-brown to dark-brown friable silt loam to cherty silt loam; few faint gray mottles in lower part.

contain little loess. Their profiles are not so strongly developed as those of the Decatur and Pembroke soils. The Baxter soils, in general, are moderately cherty and reddish, and the Bodine soils are very cherty and yellowish brown. Much of the Bodine soil is on hilly to steep slopes.

The Sulphura soils consist chiefly of residuum from non-calcareous shale intermixed with chert fragments washed from higher lying areas of Bodine soils. They have weak profiles, and depth to bedrock shale is shallow.

Soils of stream terraces and old colluvial slopes

In the past, the rivers and streams of this county flowed at considerably higher levels than at present. They deposited gravel, sand, silt, and clay on their flood plains. Over a period of many years, the streams cut deep channels and formed new flood plains at lower levels. The remnants of the older, higher flood plains remained above the overflow stage of the present streams. These are called second bottoms, benches, or terrace land. They consist of old stream alluvium that, in many places, covers shale, limestone, or chert beds, which occur at depths of 3 to many feet. On the smoother foot slopes, the parent materials have washed or rolled from the adjacent higher slopes. In many areas Captina, Etowah, and Taft soils have developed from old local alluvium.

The soils on stream terraces and old colluvial slopes are younger than those of the uplands, but they are well developed. They have been placed in the following two subgroups: (1) Soils formed chiefly from old general alluvium, and (2) soils formed chiefly from old local alluvium.

Soils formed from old general alluvium.—The Captina, Etowah, Humphreys, Robertsville, and Taft soils have formed from old general alluvium. All of these soils overlie limestone and silt, but the Captina soils are more silty than the others, and the Humphreys soils are more cherty. The Captina, Etowah, Robertsville, and Taft soils are on high terraces, but some areas of Robertsville and Taft soils are also on low terraces. The Humphreys soils occupy low terraces. Differences among the soils

have been caused chiefly by differences in drainage. The Captina soils are moderately well drained. The Robertsville soil is poorly drained, and the Taft soil is somewhat poorly drained. All of these soils have pans. The Etowah and Humphreys soils do not have pans. They are well drained, but sometimes the Humphreys soils are flooded.

Soils formed from old local alluvium.—The Minvale and Pace soils were formed from old local alluvium. They were washed from soils developed from weathered products of cherty limestone that had a thin capping of loess in places. These soils are very cherty throughout. The Minvale soils are well drained, and the Pace soils are moderately well drained to well drained.

Soils of the bottom lands and young alluvial slopes

Bottom lands are the flood plains or nearly level areas along streams that are subject to overflow. The parent material of these soils has been deposited by streams. The kind of material depends largely upon the characteristics of the soils of the higher lands from which the material was washed.

The soils of the bottom lands are young. The parent material has been deposited only recently, and in many places new sediments are added each year. The surface soils and subsoils are not so well defined as those of most of the soils of the uplands and terraces.

On the basis of differences in parent material, these soils have been placed in the following groups: (1) Soils formed from young general alluvium and (2) soils formed from young local alluvium.

Soils formed from young general alluvium.—The Ennis, Lee, and Lobelville soils were formed from young general alluvium. The parent materials were washed from upland soils developed from weathered products of cherty limestone that had a thin capping of loess in places. Chert occurs on the surface of these soils and throughout the profile. The differences among these soils have been caused mostly by differences in drainage. The Ennis soils are well drained, the Lobelville soils are somewhat

poorly drained to moderately well drained, and the Lee soils are poorly drained.

Soils formed from young local alluvium.—The Emory and Greendale soils were formed from young local alluvium. They occur along drainageways, on sloping fans, on benches at the bases of slopes, and in slight depressions. Their parent material washed from adjacent higher soils.

The Emory and Greendale silt loams are friable and well drained, but Greendale cherty silt loam is cherty throughout and is moderately well drained to well drained.

Miscellaneous land types

The miscellaneous land types mapped in this county are Cherty alluvial land; Mines, pits, and dumps; and Rockland. Cherty alluvial land is made up of very cherty stream rubble. It occupies irregular areas in the bottom lands. Mines, pits, and dumps is in the uplands. It has resulted from excavating and mining operations. Rockland, also in the uplands, is extremely stony.

Soil Associations

The map of soil associations at the back of this report shows the general patterns of the soils in Lawrence 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. In most places the pattern is related to the nature of the soil materials and to the shape of the land surface.

The seven associations in Lawrence County are discussed in the following pages.

1. Dickson-Lawrence-Guthrie

Much of this association occurs in the northeastern part of the county. Here, the drainageways have not cut deeply and permanently flowing streams are small and far apart. The areas are chiefly gently sloping. There are many depressions, however, and some of these have no outlet. Generally, surface runoff is slow and internal drainage is restricted. Most of the soils have pans, and these vary in texture and in depth.

Typically, the Dickson soils occur on the broad, gently sloping ridges; the Guthrie soils are mainly in depressions, some as much as 100 acres in size; and the inextensive Lawrence soils are in narrow bands between these soils. The Dickson soils are the most extensive. They are better drained than the Guthrie and Lawrence. The higher or more sloping areas are occupied by the well-drained Mountview soils.

Most of these soils have been cleared and used for crops. The farms are mainly small or of average size. They are mostly general farms, cotton-livestock, part-time, or residential farms. Cotton is the main cash crop, but tobacco and strawberries are grown to some extent. On many of the farms, artificial drainage is needed. The soils are generally too wet to work until late in spring and are droughty in summer. Most of the soils are in management groups 5, 8, and 9.

2. Sango-Lawrence-Guthrie

This association, the smallest in the county, occurs north of Ethridge. The soils are nearly level and some occur in depressions. Some of the depressions have

bottleneck outlets into which many of the intermittent drainageways empty. Surface runoff is slow to ponded, and internal drainage is restricted in most of the soils. Most of the soils have pans.

Typically, the Sango soils occur on broad, smooth ridges; the Guthrie soils in depressions; and the Lawrence soils between the Sango and Guthrie soils. The Sango soils are the best drained of the soils of these three series and are the most important for agriculture. The Lawrence soils are the least extensive and are generally farmed along with the Sango soils. The poorly drained Guthrie soils occupy about 45 percent of the association. In many places they are connected by intermittent drainageways that surround and isolate some areas of Lawrence and Sango soils. The Dickson and shallow Mountview soils occupy the higher, gently sloping, somewhat better drained areas. The Lee soil occupies one large poorly drained area.

This association is used largely for crops. The farms are small or average in size. There are a few livestock farms, but on most of the farms cotton or small grains are the main source of income. In most places artificial drainage is needed. The soils are usually too wet or too dry for tillage, and yields are generally low. The uncleared areas are mainly poorly drained, and the cost of clearing and maintaining such areas is usually too high to justify it. In this association, soils of management groups 8 and 9 predominate.

3. Mountview-Dickson-Lobelville

This association is on broad, gently sloping to sloping upland divides where drainageways have not cut deeply. Except for some areas in depressions, runoff is medium to rapid. Internal drainage is medium. Most of the soils overlie cherty limestone.

Mountview soils make up about 75 percent of this association. The deeper Mountview soils occupy gently sloping areas and are well drained. The shallow Mountview soils are on gently sloping to sloping areas and are somewhat droughty. The Dickson soils occupy the lower slopes or occur in slight depressions, and the Lobelville soils occur mainly along intermittent drainageways at the bases of slopes occupied by the shallow Mountview soils. In some places Greendale soils occur, and a few small depressions are occupied by Guthrie and Lee soils. Baxter and Bodine soils occur on moderately steep and steep areas along the border of the association, and Captina soils occur in some gently sloping and sloping areas.

A large part of this association is cropped, but some is idle. Some of the farms are large, but most are small or of average size. The farm population is large. Many of the small farms are part time, or the products are grown chiefly for home use. The larger farms are mainly of the general, general-livestock, or cotton-livestock type. The main crops are cotton, corn, small grains, and common lespedeza. Soybeans, vetch, small grains, and buckwheat are grown on small acreages.

These soils are suited to many of the commonly grown crops, but they have a high risk of erosion and require careful management. In many areas, particularly on small farms, these soils are farmed too intensively to maintain good yields. Most of the soils are in management groups 5, 6, and 9.

4. *Pembroke-Decatur-Emory*

The soils of this association are on broad, gently sloping ridges of a slightly dissected plain. The slopes are generally short. There are many shallow, intermittent drainageways and a few permanently flowing streams. The association occurs in two main areas. One is in a long, narrow belt that parallels United States Highway 64 and Crowson Creek, and the other lies between Lawrenceburg and Ethridge. Most of the association is well drained, but some of the soils in depressions are very poorly drained.

Typically, the Pembroke soils occupy the broad, smooth ridges; the Decatur silt loams, the gently sloping ridges; and Decatur silty clay loams and shallow Cookeville soils, the mild slopes. Baxter soils are on the moderately steep and steep slopes. The Emory soil occurs on the foot slopes. Guthrie soils occupy the depressions in the association. In many places between the Guthrie and better drained soils, there are areas of the dark brown surface phases of Dickson silt loam and some areas of Pembroke soil that are more poorly drained than the typical soil. Bewleyville soils occupy some areas on the broader ridges, and there are small areas of Ennis and Lobelville cherty silt loams on the first bottoms.

This association is cropped the most intensively of any in the county. Only a small part, mostly Guthrie and steeper Baxter soils, is in trees. Most of the farms are large. Cotton farms are the main type, but there are some cash-grain, general, and livestock farms. The chief crops are cotton, corn, alfalfa, small grains, vetch, and crimson clover. The soils are well suited to a number of crops, and good yields are obtained. The soils are mostly in management groups 2, 3, and 4.

5. *Bewleyville-Cookeville-Baxter-Greendale*

This association occupies four irregular, widely separated areas. The areas are dissected to some extent. Each has at least one small, permanently flowing stream with intermittent drainageways branching out in a dendritic pattern. The stream bottoms are generally narrow. The areas are mostly gently sloping to sloping, but there are some depressions. Most of the soils are well drained and overlie cherty limestone.

Typically, Bewleyville soils occur on the mild slopes; Cookeville soils are on the gently sloping and sloping areas; and Baxter soils are on the gently sloping to moderately steep areas. Etowah, Humphreys, and Minvale soils occupy the terraces, and the Emory and Greendale soils occupy foot slopes. Ennis and Lobelville soils are on first bottoms, and Guthrie and Lee soils occupy depressions. There are many small areas in which Decatur, Dickson, Lobelville, Mountview, Pembroke, and light-colored Baxter soils occur in intricate patterns.

The farms are small to average in size, and most of them are cotton or general farms. There are a few grain and livestock farms, however, and some part-time and residential farms. The chief crops grown are cotton, corn, small grains, crimson clover, and common lespedeza. The soils are suited to many crops but vary in suitability and response to management. Careful management is needed to control erosion. These soils are mostly in management groups 2, 3, 4, and 10.

6. *Bodine-Mountview (shallow)-Greendale-Lobelville*

This association occupies more than 50 percent of the county. The areas are highly dissected, and the many

small, permanently flowing streams form a dendritic pattern. Generally the ridges are narrow, and the valleys are deep, are steep walled, and have narrow bottoms. Some areas have slopes that are moderately steep. Drainage is good to excessive in the upland areas and moderately good to somewhat poor in the narrow first bottoms along small creeks. Most of the soils are cherty silt loams and overlie cherty limestone.

The gently sloping to steep areas are occupied by cherty or shallow, droughty soils. Typically, the Bodine soils are on the gently sloping, moderately steep, and steep slopes, and the shallow Mountview soils are on the smoother ridge crests. The Greendale soils are on foot slopes along the intermittent drainageways, and the Lobelville soils occupy the lower positions along creeks and large drainageways. Large areas of light-colored Baxter soils occur in positions similar to those of the Bodine soils in the southwestern part of the county. The Sulphura soils occur on lower slopes in many places along Knob and Shoal Creeks. The Captina, Etowah, Minvale, and Pace soils occur on terraces and old colluvial slopes, and the poorly drained Lee soil occupies some areas along sluggish streams. In some places the steeper slopes above the streams are nearly vertical rock bluffs.

In the western part of the county, large areas of this association are in forested tracts that are not considered farmland. Generally, the soils on the upland ridges are not suited to cultivated crops but are better suited to pasture or trees. The soils of the valleys, as Greendale and Lobelville, however, are suited to fairly intensive use. Many of the soils in this association are best suited to forest, and many areas should be reforested.

On areas that are farmed, the chief crops are cotton and corn. Some vegetables, potatoes, rye, vetch, oats, alfalfa, and strawberries are grown. Tobacco is grown on some farms, particularly in the northern part of the county. Poultry, hogs, and milk cows are generally raised for use on the farm. Only a small part of the farm income is derived from the sale of forest products. Good management is required in all areas to get the best production from these soils. Soils of management groups 2, 7, 10, and 11 predominate.

7. *Ennis-Humphreys-Etowah-Captina*

Most of the soils in this association are on first bottoms and terraces. They generally occupy long areas, less than one-half mile wide, along the large creeks. The soils of the first bottoms are well drained and nearly level. The soils of the terraces are gently sloping to sloping. They rise gently from the first bottoms and seldom lie as much as 50 feet above a stream. The soils of the terraces generally have moderately good to good drainage, but many small areas are somewhat poorly drained or poorly drained. Most of the soils have formed from materials that were washed from soils weathered from cherty limestone, but there was some loess in places. In some places the soils of the terraces are underlain by chert, shale, or limestone at depths of 4 feet or more.

The soils vary widely in drainage, content of chert, and in size and shape of the areas. Typically, the Ennis soils are on first bottoms and the Humphreys soils are on low terraces. Of these two series the soils that contain the most silt occur along the larger streams and the ones that contain the most chert are along minor streams. Captina and Etowah soils are on gently sloping terraces,

and Robertsville and Taft soils occur in terrace depressions. In most places on the sloping areas, cherty Minvale and Pace soils occur at the bases of steep slopes. Emory, Greendale, and Lobelville soils occur on foot slopes. The Ennis soils are mainly along the larger streams, and the Lobelville soils occur, in many places, on first bottoms along the smaller streams.

Most of this association is used for crops, and the soils are among the most desirable in the county for general farming. Some of the poorly drained areas are used for hay or pasture, and some are idle. Most of the farms are small and of the general type, but there are some beef and dairy farms.

The soils of the terraces are suited to most of the crops commonly grown in the county. The better drained soils of the bottom lands are suited to corn or soybeans. Cotton and tobacco are the main cash crops, but some strawberries are grown. Most herds of beef and dairy cattle are small. Some calves and pigs are sold as feeders. Soils of management groups 1, 2, and 3 predominate.

Soil Descriptions

The soils of Lawrence County are described in detail in the following pages, and their use and suitability for agriculture are discussed. Some technical terms were used to make the soil descriptions more concise and exact. Definitions of these terms are given in the glossary, p. 61. The approximate acreage and the proportionate extent of the soils are given in table 5. Their location and distribution are shown on the soil map at the back of this report.

Baxter cherty silt loam, moderately steep phase (12 to 25 percent slopes) (Bd).—This soil has formed on upland slopes under a deciduous forest. It occupies small areas scattered throughout the county. Most of it is in the Bewleyville-Cookeville-Baxter-Greendale and the Pembroke-Decatur-Emory soil associations. This soil has a lighter colored surface layer and contains more chert than the Bewleyville, Cookeville, Pembroke, and Decatur soils. Its parent material is similar to that from which the Bodine soils have developed, but this soil is deeper, redder, and contains less chert and more clay than the Bodine soils.

Profile description of undisturbed soil:

- A thin layer of leaves and other forest litter on the surface.
- 0 to 6 inches, pale-brown to brown, friable cherty silt loam, the upper 2 inches somewhat darker because of the higher content of organic matter; contains chert fragments up to 6 inches in size.
- 6 to 28 inches, red, firm cherty silty clay loam; chert fragments generally between 1 and 6 inches in size, and chertiness increases with depth; moderate, medium blocky structure.
- 28 to 48 inches+, dark-red, firm, compact very cherty silty clay loam or silty clay; moderate medium subangular blocky structure; bedrock, in most places, is at depths of 8 feet or more.

In a few places the surface layer and subsoil are very cherty. The surface layer, in a few places, contains small pieces of quartz. The subsoil ranges from dark red to reddish yellow. In a few places the profile contains silt that resembles loess.

This soil is strongly acid to very strongly acid. The content of organic matter and plant nutrients is moderate. Surface runoff is rapid, and the water-holding capacity is moderate to low. This soil is permeable.

Included with this soil are a few areas that have a darker colored, heavier textured subsoil than that described in the typical profile.

Use and suitability (management group 10).—All of this soil is under forest. The forest has been cut over several times, and the present trees are small to medium in size. Under present management yields of timber are low. Most of this soil is best kept under forest. On some farms it would not be practical to use it for crops or pasture because it is so inaccessible. Furthermore, it is poorly suited to tilled crops. The moderately steep slopes and chert make it difficult to work and not well suited to the use of heavy machinery. If the soil is tilled, it will need management that will protect it from erosion. Lime and fertilizer are needed for satisfactory yields of crops or pasture.

Fair pastures can be established and maintained. They should not be overgrazed during dry periods.

Baxter cherty silt loam, eroded moderately steep phase (12 to 25 percent slopes) (Be).—Except that this soil has a thinner surface layer, it is similar to Baxter cherty silt loam, moderately steep phase. From 25 to 75 percent of the original surface soil has been lost through erosion. In many places there has been some mixing of the subsoil with the original surface soil. There are many spots so severely eroded that the reddish subsoil is exposed. In these places the surface soil is finer textured and less friable than in the typical soil. The present surface layer ranges from pale brown to brown, and the subsoil, from dark red to reddish yellow. There are a few shallow gullies in most areas of this soil.

This soil is strongly acid to very strongly acid. The content of organic matter and plant nutrients is low. Runoff is rapid and internal drainage is medium. The water-holding capacity is low.

Use and suitability (management group 10).—All of this soil has been cleared. An estimated 60 percent is in pasture, about 20 percent is in crops, and the rest is idle.

This soil has become more susceptible to erosion, and careful management is needed to protect it from further loss of soil. For most crops, it is moderately low in nitrogen, phosphorus, potassium, and lime. On areas that are cropped, management will be needed to check runoff and to keep a supply of moisture in the soil. Fair pastures can be established, but in dry seasons yields are low because of the low moisture-supplying capacity of the soil. Some areas would be best returned to forest.

Baxter cherty silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Ba).—Except that this soil is on milder slopes, is less cherty, and is somewhat eroded, it is similar to Baxter cherty silt loam, moderately steep phase. It occurs on ridge crests and is associated with the Cookeville, Bewleyville, Bodine, and Mountview soils, and with other Baxter soils.

The present surface layer is pale-brown to brown, friable, cherty silt loam. The subsoil is dark-red to yellowish-red, firm, cherty silty clay loam.

In some places chert fragments have accumulated on the surface. In places some loess occurs in the upper layers and the surface soil has a more yellowish color and is siltier in texture than typical.

About 25 percent of this soil is not eroded. In these areas the surface soil is thicker, is darker colored, and has a higher content of organic matter and plant nutrients than in the typical soil. Most of it is in small, uncleared areas.

TABLE 5.—Approximate acreage and proportionate extent of soils

Soil	Area	Extent	Soil	Area	Extent
Baxter cherty silt loam:	<i>Acres</i>	<i>Percent</i>	Etowah silty clay loam, severely eroded sloping phase.....	<i>Acres</i>	<i>Percent</i>
Moderately steep phase.....	1, 019	0. 3	Greendale cherty silt loam.....	233	(¹)
Eroded moderately steep phase.....	1, 301	. 3	Greendale silt loam.....	14, 878	3. 7
Eroded gently sloping phase.....	478	. 1	Guthrie silt loam.....	4, 371	1. 1
Sloping phase.....	443	. 1	Overwash phase.....	6, 878	1. 7
Eroded sloping phase.....	930	. 2	Humphreys silt loam.....	2, 616	. 6
Sloping light colored phase.....	839	. 2	Humphreys cherty silt loam.....	1, 969	. 5
Eroded sloping light colored phase.....	1, 701	. 4	Lawrence silt loam.....	755	. 2
Gently sloping light colored phase.....	228	(¹)	Brown variant.....	2, 968	. 7
Eroded gently sloping light colored phase.....	987	. 2	Lee silt loam.....	273	. 1
Moderately steep light colored phase.....	1, 211	. 3	Lobelville silt loam.....	4, 454	1. 1
Eroded moderately steep light colored phase.....	1, 710	. 4	Lobelville cherty silt loam.....	3, 461	. 9
Steep light colored phase.....	3, 553	. 9	Lobelville silt loam, local alluvium phase.....	6, 727	1. 7
Eroded steep light colored phase.....	1, 572	. 4	Mines, pits, and dumps.....	11, 275	2. 8
Baxter cherty silty clay loam:			Minvale cherty silt loam:		
Severely eroded sloping phase.....	956	. 2	Eroded gently sloping phase.....	1, 251	. 3
Severely eroded moderately steep phase.....	596	. 1	Sloping phase.....	207	(¹)
Bewleyville silt loam:			Eroded sloping phase.....	2, 422	. 6
Eroded gently sloping shallow phase.....	2, 058	. 5	Eroded moderately steep phase.....	960	. 2
Gently sloping shallow phase.....	247	. 1	Minvale cherty silty clay loam:		
Bodine cherty silt loam:			Severely eroded sloping phase.....	576	. 1
Sloping phase.....	13, 323	3. 3	Severely eroded moderately steep phase.....	136	(¹)
Eroded sloping phase.....	20, 153	5. 0	Mountview silt loam:		
Severely eroded sloping phase.....	2, 042	. 5	Gently sloping phase.....	3, 435	. 9
Gently sloping phase.....	1, 834	. 5	Eroded gently sloping phase.....	11, 459	2. 8
Eroded gently sloping phase.....	5, 355	1. 3	Gently sloping shallow phase.....	18, 196	4. 5
Steep phase.....	38, 574	9. 5	Eroded gently sloping shallow phase.....	34, 063	8. 4
Eroded steep phase.....	15, 008	3. 7	Sloping shallow phase.....	7, 631	1. 9
Moderately steep phase.....	31, 160	7. 7	Eroded sloping shallow phase.....	13, 653	3. 4
Eroded moderately steep phase.....	25, 940	6. 4	Mountview silty clay loam, severely eroded sloping shallow phase.....	6, 624	1. 6
Bodine fine cherty silt loam:			Pace cherty silt loam:		
Eroded gently sloping phase.....	1, 150	. 3	Eroded sloping phase.....	2, 293	. 6
Eroded sloping phase.....	895	. 2	Sloping phase.....	629	. 2
Captina silt loam:			Eroded gently sloping phase.....	1, 543	. 4
Eroded gently sloping phase.....	4, 246	1. 1	Eroded moderately steep phase.....	230	(¹)
Gently sloping phase.....	1, 147	. 3	Pace cherty silty clay loam, severely eroded sloping phase.....	193	(¹)
Eroded sloping phase.....	308	. 1	Pace silt loam:		
Cherty alluvial land.....	397	. 1	Eroded gently sloping phase.....	905	. 2
Cookeville silt loam:			Eroded sloping phase.....	163	(¹)
Gently sloping phase.....	648	. 2	Pembroke silt loam:		
Eroded gently sloping phase.....	4, 212	1. 0	Eroded gently sloping phase.....	2, 803	. 7
Sloping phase.....	410	. 1	Level phase.....	537	. 1
Eroded sloping phase.....	1, 749	. 4	Robertsville silt loam.....	640	. 2
Cookeville silty clay loam, severely eroded sloping phase.....	1, 830	. 5	Rockland.....	1, 632	. 4
Decatur silt loam:			Sango silt loam:		
Eroded gently sloping phase.....	2, 674	. 7	Gently sloping phase.....	455	. 1
Eroded sloping phase.....	390	. 1	Eroded gently sloping phase.....	887	. 2
Decatur silty clay loam:			Level phase.....	483	. 1
Severely eroded gently sloping phase.....	637	. 2	Sulphura cherty silt loam:		
Severely eroded sloping phase.....	1, 583	. 4	Steep phase.....	2, 337	. 6
Dickson silt loam:			Eroded steep phase.....	947	. 2
Gently sloping phase.....	3, 181	. 8	Eroded moderately steep phase.....	653	. 2
Eroded gently sloping phase.....	9, 665	2. 4	Taft silt loam.....	1, 259	. 3
Eroded gently sloping dark brown surface phase.....	1, 036	. 3			
Level dark brown surface phase.....	235	(¹)	Subtotal.....	404, 950	99. 8
Emory silt loam.....	2, 915	. 7	Water.....	810	. 2
Ennis silt loam.....	5, 283	1. 3			
Ennis cherty silt loam.....	2, 401	. 6	Total.....	405, 760	100. 0
Etowah silt loam:					
Eroded gently sloping phase.....	3, 685	. 9			
Eroded sloping phase.....	498	. 1			

¹ Less than 0.1 percent.

Baxter cherty silt loam, eroded gently sloping phase, is strongly acid to very strongly acid. Erosion has caused the content of organic matter and plant nutrients to be lower than in the uneroded Baxter cherty silt loams. Run-off and internal drainage are medium. The water-holding capacity is fair to good. This soil is permeable.

Use and suitability (management group 4).—Most of this soil has been used for crops or pasture. Cotton, corn, and common lespedeza are the main crops. About 25 percent is in cutover forest, chiefly of oak, hickory, and poplar. A small acreage is idle.

Although this soil is suited to the crops commonly

grown in the county, yields are low under present management. Lime and fertilizer are needed for all crops and particularly for alfalfa, strawberries, and orchardgrass. A suitable crop rotation is 1 year of a row crop to 3 or 4 years of close-growing crops. Crops give moderate to good yields under improved management. Although the chert hinders tillage, the soil is otherwise easy to work. Some small areas are surrounded by larger areas of soils that are poorly suited to cultivation. These are best used for forest.

Baxter cherty silt loam, sloping phase (5 to 12 percent slopes) (Bb).—Except that this soil is on milder slopes, has slightly thicker layers, and is somewhat deeper over bedrock, it is similar to Baxter cherty silt loam, moderately steep phase. Most of it is in the Bewleyville-Cookeville-Baxter-Greendale soil association. It occurs on narrow ridge crests above steep slopes occupied by Baxter or Bodine soils, or on slopes that are below gently sloping areas of Bewleyville soils.

This soil is strongly acid to very strongly acid. It has medium runoff and internal drainage and moderate water-holding capacity.

Use and suitability (management group 4).—Most of this soil is in cutover forest, but it is well suited to all the commonly grown crops and to pasture. The yields are moderate. Alfalfa and red clover can be grown under good management.

Although the chert interferes with tillage, this soil is easy to work. Most slopes are too short for stripcropping, but contour tillage can be used. Terracing is needed in some areas. Moderate to long crop rotations can be used on this soil, but lime and fertilizer will be needed. Some small areas that are surrounded by moderately steep and steep cherty soils should be left in forest.

Baxter cherty silt loam, eroded sloping phase (5 to 12 percent slopes) (Bc).—Except that this soil is on milder slopes and has somewhat thicker layers and slight erosion, it is similar to Baxter cherty silt loam, moderately steep phase. It occurs in similar locations and is associated with the same soils.

The surface layer is pale-brown to brown, friable, cherty silt loam. The subsoil is dark-red to reddish-yellow, firm, cherty silty clay loam.

In most places where much of the original soil has been lost by erosion, tillage has mixed the upper subsoil with the remaining surface soil. In some of the idle fields, shallow gullies have formed. Chert has accumulated on the surface in some places.

This soil is strongly acid to very strongly acid. Surface runoff and internal drainage are medium, and the water-holding capacity is moderate.

Included in this mapping unit are some small areas in which the soil is severely eroded. In the included areas the soil is redder, heavier textured, and firmer than the typical soil.

Use and suitability (management group 4).—All of this soil has been cleared. Most of it is used for crops or pasture, and only a small acreage is idle. The principal crops are corn, cotton, and common lespedeza.

Although this soil is suited to all the crops commonly grown in the county, including alfalfa, only moderate yields are obtained, even under good management. This soil has been cropped so frequently and it is so eroded that it needs more lime, fertilizer, and organic matter than Baxter cherty silt loam, sloping phase. Otherwise, the

two soils can be managed the same. This soil is moderately well suited to tree fruits. Some areas should be returned to forest.

Baxter cherty silt loam, sloping light colored phase (5 to 12 percent slopes) (Bh).—This soil has formed on ridges under a deciduous forest. The native trees were mainly red, white, post, and chestnut oak, hickory, yellow-poplar, and some ash, black walnut, and wild cherry. Most of this soil occurs in the southern part of the county, chiefly in the Bewleyville-Cookeville-Baxter-Greendale and Bodine-Mountview (shallow)-Greendale-Lobelville soil associations.

Profile description of undisturbed soil:

A thin covering of leaves and undecomposed organic matter on the surface.

0 to 6 inches, light yellowish-brown friable cherty silt loam, the surface 1 or 2 inches slightly darker because of the higher content of organic matter; contains chert fragments up to 4 inches in size.

6 to 22 inches, yellowish-brown to yellowish-red friable cherty silt loam or cherty silty clay loam; contains many chert fragments about 2 inches in size and a few more than 4 inches in size.

22 to 48 inches, red, firm, cherty silty clay loam; the chertiness increases with depth; moderate medium blocky structure; cherty limestone bedrock, in most places, is at depths of 6 feet or more.

In some places the surface layer and subsoil are very cherty. In many places small pebbles occur in the upper 12 inches of the soil. The surface layer ranges in color from light yellowish brown to brownish gray. In some places the profile contains silt that resembles loess.

This soil is strongly acid to very strongly acid, and the content of organic matter is low. This soil is somewhat excessively drained. Runoff and internal drainage are rapid, and the water-holding capacity is low. This soil is permeable enough to allow plant roots, water, and air to penetrate.

Use and suitability (management group 7).—Most of this soil is in cutover forest and should remain in forest. The soil can be used for crops, but the chert hinders tillage. Furthermore, many of the areas are not easily accessible. If this soil is used for crops, stripcropping and contour tillage are needed. Moderate to long rotations that include grasses and legumes are required. Lime and fertilizer are needed. The soil is fairly well suited to pasture, but soil amendments are necessary, and yields will be low during dry seasons.

Baxter cherty silt loam, eroded sloping light colored phase (5 to 12 percent slopes) (Bk).—Except that this soil has a thinner surface layer, it is similar to Baxter cherty silt loam, sloping light colored phase. It occurs in similar locations and in association with the same soils. Between 50 and 75 percent of the surface soil has been lost through erosion, and short, shallow gullies occur in most areas.

In many places there has been some mixing of the subsoil with the surface soil. The present surface soil is light yellowish-brown to light brownish-gray cherty silt loam. In a few places the yellowish-brown to yellowish-red subsoil is exposed and the surface soil is friable cherty clay loam.

This soil is strongly acid to very strongly acid. Runoff and internal drainage are rapid, and the water-holding capacity is low.

Use and suitability (management group 7).—All of this soil has been used for crops and pasture, but most of it is now idle or in unimproved pasture. On some farms it is

best used for pasture. On others, where the areas are not easily accessible, forest is the best use. The small areas that are cropped are used mainly to grow corn, cotton, and common lespedeza.

If used for crops this soil should be tilled on the contour. A suitable rotation would be 1 year of a row crop followed by 3 to 4 years of sericea lespedeza. All of the crops will need lime and fertilizer but will give only fair yields.

Baxter cherty silt loam, gently sloping light colored phase (2 to 5 percent slopes) (Bf).—Except that this soil is a little less cherty, has somewhat thicker layers, and occupies milder slopes, it is similar to Baxter cherty silt loam, sloping light colored phase. It occurs in similar locations and is associated with the same soils.

The surface layer is light yellowish-brown to light brownish-gray, friable cherty silt loam about 6 inches thick. The subsoil is yellowish-brown to yellowish-red, friable cherty silty clay loam.

In some places there is a thin layer of loess. The soil in these areas has a surface layer that is yellower and more silty than the typical soil.

This soil is strongly acid to very strongly acid. Its content of organic matter is moderately low. The soil has rapid internal drainage, runoff is medium, and the water-holding capacity is low.

Use and suitability (management group 7).—This soil is fairly well suited to crops and pasture, but all of it is in cutover forest. Some areas, because of small size and inaccessibility, should be kept in forest. The soil can be used and managed the same as the sloping light colored phase. Erosion control is less difficult, however, because of the milder slopes. In some places the use of this soil will be determined by that of the associated soils.

Baxter cherty silt loam, eroded gently sloping light colored phase (2 to 5 percent slopes) (Bg).—This soil is similar to Baxter cherty silt loam, gently sloping light colored phase, but has lost part of its surface soil through erosion. The surface layer is mixed with some of the subsoil so that the present surface layer is somewhat yellower or browner than that of the uneroded soil. The content of organic matter and plant nutrients is also lower. The two soils occur in similar areas and are associated with the same soils.

In places chert has accumulated on the surface of this soil. This soil is strongly acid to very strongly acid. Internal drainage is rapid and runoff is medium. The water-holding capacity is low.

Use and suitability (management group 7).—All of this soil has been used for row crops and pasture. At present about 50 percent is in crops, 25 percent is in unimproved pasture, and the rest is idle or abandoned. The main crops are cotton, corn, and common lespedeza.

This soil is fairly well suited to crops and pasture, but on some farms it is best used for pasture or, if the areas are not easily accessible, for forest. The crops and pastures need lime and fertilizer. Under good management moderate to long crop rotations can be used. This soil gives fair to good response to management, but as the soil is droughty yields are uncertain. Although the chert hinders tillage, this soil is easy to work.

Baxter cherty silt loam, moderately steep light colored phase (12 to 25 percent slopes) (Bm).—Except that this soil is steeper, generally has somewhat thinner layers, and in places on the lower slopes some shale outcrops, it is similar to Baxter cherty silt loam, sloping light colored

phase. It occurs in similar locations and is associated with the same soils.

This soil is strongly acid to very strongly acid. Internal drainage is rapid and runoff is very rapid. The water-holding capacity is low.

Included in this mapping unit are a few small areas of Bodine and Baxter soils and some areas of Sulphura cherty silt loams.

Use and suitability (management group 10).—All of this soil is in cutover forest, and on many farms this is its best use. It is fairly well suited to crops but is better suited to pasture.

Under good management crops yield fairly well. Pastures planted to orchardgrass, whiteclover, and sericea lespedeza give fair response to fertilizer. If the soil is cropped, measures to control erosion are needed. Suitable rotations consist of row crops grown in long rotations with close-growing crops.

Baxter cherty silt loam, eroded moderately steep light colored phase (12 to 25 percent slopes) (Bn).—Except that this soil generally has somewhat thinner layers and is on steeper slopes, it is similar to Baxter cherty silt loam, sloping light colored phase. It occurs in similar places and is associated with the same soils. From 25 to 75 percent of the surface soil has been lost by erosion. There are some short, shallow gullies on this soil and a few deeper gullies that are not easy to cross.

This soil is strongly acid to very strongly acid. It is low in content of organic matter. Internal drainage is rapid and runoff is very rapid. The water-holding capacity is low.

Use and suitability (management group 10).—All of this soil has been used for crops and pasture. At present, about 50 percent is idle, 40 percent is in unimproved pasture, and the rest is used for crops. Corn and common lespedeza are the main crops grown.

This soil is only fairly well suited to crops, even under good management. It is better suited to pasture. Inaccessible areas are best used for forest.

If the soil is cropped, long rotations must be used to reduce erosion. Crop yields are low and failures are common. Lime and fertilizer are needed for all crops and pasture. Orchardgrass, whiteclover, sericea lespedeza, and other lespedezas grow well. Pastures give good response to fertilizer, but grazing must be controlled during dry periods.

Baxter cherty silt loam, steep light colored phase (25 to 65 percent slopes) (Bo).—Except that this soil is on steeper slopes, has thinner layers, and the depth to bedrock is shallower, it is similar to Baxter cherty silt loam, sloping light colored phase. It occurs in the southern part of the county in association with other Baxter soils and with Bodine and Sulphura soils.

In many places very cherty material is at depths below 30 inches. Many shale and rock outcrops occur on the steeper, lower slopes. In some places these are calcareous. About 20 percent of this soil has a slightly browner surface layer than the normal soil and a subsoil of firm, red, cherty silty clay loam.

Baxter cherty silt loam, steep light colored phase, is strongly acid to very strongly acid. Internal drainage is rapid and runoff is very rapid. The water-holding capacity is low.

Included in this mapping unit are some small areas of the steep phases of the Baxter, Bodine, and Sulphura soils

Use and suitability (management group 11).—Most of this soil is still in forest and should not be cleared unless pasture is greatly needed. The trees are mainly oak and hickory, but there are some poplar, walnut, ash, and cherry trees. This soil is too cherty and steep, the erosion hazard too high, and the water-holding capacity too low for the soil to be used for crops or pasture over a long period. Even under good management pastures can be established and maintained only with difficulty.

Baxter cherty silt loam, eroded steep light colored phase (25 to 65 percent slopes) (Bp).—Except that this soil is on steeper slopes, has a thinner surface layer, and is shallower to bedrock, it is similar to Baxter cherty silt loam, sloping light colored phase. It occurs in similar places and is associated with the same soils. The surface soil is light yellowish-brown to light brownish-gray friable cherty silt loam. From 25 to 75 percent of the original surface soil has been lost by erosion, and shallow gullies are common. The rest of this soil is even more severely eroded.

This soil has variations and inclusions similar to those of Baxter cherty silt loam, steep light colored phase. In some small severely eroded places, the yellowish-brown or red cherty silty clay loam is exposed.

This soil is strongly acid to very strongly acid. Internal drainage is rapid and runoff is very rapid. The water-holding capacity is low.

Use and suitability (management group 11).—All of this soil has been cleared for many years. At present about 75 percent is idle, about 5 percent is used for corn, and some areas are used for unimproved pasture.

This soil is best suited to forest. It is poorly suited to crops and is only fairly well suited to pasture. Under usual management crop and pasture yields are low and corn often fails. Under good management fair pastures can be established and maintained. Lime and fertilizer are needed, and grazing must be carefully controlled. This soil is hard to work.

Baxter cherty silty clay loam, severely eroded sloping phase (5 to 12 percent slopes) (Br).—This soil is similar to Baxter cherty silt loam, moderately steep phase. It differs in that it has milder slopes and is more eroded, and there are more spots in which the subsoil is lighter colored and coarser textured. This soil occurs in similar places and is associated with the sloping phases of Baxter cherty silt loam. Most of the original surface soil has been lost through erosion and in some places part of the subsoil. Short, shallow gullies are common. Tillage is now in the subsoil.

The surface layer is light yellowish-brown to yellowish-red, friable cherty silt loam to firm cherty silty clay loam. The subsoil is yellowish-brown, friable cherty silt loam or dark-red firm cherty silty clay loam.

In some places a few inches of the original surface soil remains. In some places chert has accumulated on the surface of this soil.

This soil is strongly acid to very strongly acid. It has a low to very low content of organic matter. Internal drainage is medium to rapid, and runoff is rapid. The water-holding capacity is low. The erosion hazard is high.

Use and suitability (management group 4).—All of this soil has been used for crops and pastures. Nearly all of it is now idle or abandoned and is partly covered with weeds and brush. Some of it is reverting to forest. A small

acreage is used for corn, cotton, and common lespedeza, and some is used for unimproved pasture. This soil is best suited to pasture and close-growing crops such as small grains and hay. It is hard to work. Some areas are best suited to forest.

This soil can be used for crops and pastures only if well managed. If used for crops, long rotations are needed and tillage should be on the contour. Lime, fertilizer, and the addition of organic matter are required for all crops and pastures. Yields are low.

Baxter cherty silty clay loam, severely eroded moderately steep phase (12 to 25 percent slopes) (Bs).—Except that this soil is severely eroded and has a lighter colored, coarser textured subsoil, it is similar to Baxter cherty silt loam, moderately steep phase. It occurs in similar places and is associated with the same soils. Nearly all of the original surface soil has been lost by erosion. Short, shallow gullies are common.

The surface layer of this soil is light yellowish-brown to yellowish-red cherty silt loam or cherty silty clay loam that is friable to firm in consistence. The subsoil is yellowish-brown to dark-red, friable cherty silt loam or firm cherty silty clay loam.

In some places between gullies a few inches of the original surface soil remains. In many places the finer textured subsoil has been exposed. In other places some chert has accumulated on the surface.

This soil is strongly acid to very strongly acid. The internal drainage is medium to rapid, and runoff is very rapid. The water-holding capacity is low.

Use and suitability (management group 10).—All of this soil has been cultivated. About 70 percent is idle or abandoned and is partly covered with weeds and brush. Some of these areas are reverting to forest. About 20 percent is in pastures that are mainly unimproved. A small acreage is in row crops, mostly corn. The yields are low and crops often fail. This soil is poorly suited to crops and is only slightly better suited to pasture. It is hard to work and conserve. Even under good management pastures are hard to establish and maintain. Much of this soil is best used for forest.

Bewleyville silt loam, eroded gently sloping shallow phase (2 to 5 percent slopes) (Bu).—This soil occurs on upland slopes. It has formed under a hardwood forest consisting chiefly of oak and hickory. The parent material is a 20- to 42-inch layer of loess that overlies cherty limestone residuum. Most of this soil is in the Bewleyville-Cookeville-Baxter-Greendale and the Pembroke-Decatur-Emory soil associations. It is less cherty than the Baxter soils. It also has a darker colored surface soil and a browner and more friable upper subsoil. Except that this soil has formed in a thicker layer of loess and has a browner, more friable, less clayey upper subsoil, it is similar to the Cookeville soils.

Profile description:

- 0 to 6 inches, yellowish-brown to brown, very friable silt loam; weak fine crumb structure.
- 6 to 24 inches, strong-brown to yellowish-red, firm silty clay loam; contains some chert fragments up to one-half inch in diameter and a few small reddish and yellowish pebbles; moderate medium blocky structure.
- 24 to 48 inches+, red compact silty clay, silty clay loam, or cherty silty clay loam; contains chert fragments up to 2 inches in size, and chertiness increases with depth; strong medium subangular blocky structure; weathered cherty material at depths of 6 to 8 feet.

The color of the surface soil ranges from light yellowish brown to dark brown. The color of the subsoil is brown or dark brown in some places and yellowish red or red in others. In some places the underlying material varies in chert content, but depth to bedrock, in most places, is 8 feet or more. In many places there has been some mixing of the subsoil with the surface soil. In some areas the subsoil has been exposed by erosion.

This soil is medium acid to very strongly acid. The content of organic matter is medium to low. Surface runoff is medium, and the water-holding capacity is moderate to high. This soil is moderately permeable.

Included with this soil are a few areas that have a thinner layer of silt and a redder, firmer surface layer than typical. These areas were too small to map separately.

Use and suitability (management group 3).—Bewleyville silt loam, eroded gently sloping shallow phase, has nearly all been cleared. Most of it is used for crops and pasture, and only a small acreage is idle.

This soil is easy to work. It is productive and well suited to small grains, crimson clover, vetch, and permanent pasture. It is also suited to tree fruits. Alfalfa and red clover grow well, but to establish a stand and to keep these crops growing well, lime and a complete fertilizer are needed. Under good management row crops can be grown in short rotations and erosion can be kept to a minimum.

Bewleyville silt loam, gently sloping shallow phase (2 to 5 percent slopes) (Bt).—Except that this soil has a thicker surface layer, it is similar to Bewleyville silt loam, eroded gently sloping shallow phase. It occurs in similar areas. The surface layer of this soil is generally undisturbed and is 5 to 8 inches thick. In places it is covered by a thin layer of forest litter and organic matter.

This soil is medium acid to very strongly acid. The content of organic matter is moderate. Surface runoff and internal drainage are medium, and the water-holding capacity is high.

Use and suitability (management group 3).—All of this soil is in cutover forest. The trees are mostly oak and hickory.

This soil is well suited to small grains, crimson clover, vetch, permanent pasture, and tree fruits, and yields are high. Alfalfa and red clover grow well but need lime and a complete fertilizer. This soil is easy to work. Under good management row crops can be grown in short rotations and erosion losses kept to a minimum.

Bodine cherty silt loam, sloping phase (5 to 12 percent slopes) (Bx).—This excessively drained soil has formed from cherty materials. It occurs on sloping upland ridges. Locally, it is known as "white gravelly ridgeland" or "white gravelly soil." Most of this soil is in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association. It is associated with the Baxter soils, the shallow Mountview soils, the Sulphura soils, and with other Bodine soils. This soil is thinner, lighter colored, and contains more chert and less clay than the Baxter and Mountview soils.

Profile description of undisturbed soil:

A thin layer of leaves and forest litter is on the surface.

0 to 6 inches, light-gray to light yellowish-brown, friable, gritty cherty silt loam stained dark with organic matter in the upper part; contains chert fragments up to 6 inches in diameter.

6 to 18 inches, pale-brown to yellowish-brown, friable cherty

silt loam to light silty clay loam; weakly mottled in lower part with yellow, gray, and red.

18 inches+, mottled gray, yellow, brown, and red very cherty silt loam.

In a few places the depth to bedrock is shallow and the rock outcrops. In most places, however, weathered material is several feet thick over the bedrock. In many places quartz and chert pebbles occur on the surface. The surface layer ranges from 4 to 8 inches in thickness, and the subsurface layer, from 10 to 20 inches. In many places some loess occurs in the parent material. The content of chert varies, but in most places chert beds occur within 36 inches of the surface.

This soil is strongly acid to very strongly acid. Except for the thin surface layer of leaves and forest litter, it is low in organic matter. The soil is permeable and droughty. Surface runoff and internal drainage are rapid, and the water-holding capacity is low.

Included with this soil in mapping are a few areas that have slopes of 2 to 5 percent. Many areas have irregular slopes. Also included are some small areas of light-colored Baxter soils, of Bodine fine cherty silt loam, and of shallow Mountview soils.

Use and suitability (management group 7).—All of Bodine cherty silt loam, sloping phase, is in cutover forest, chiefly oak and hickory. The present stand is thin. The trees are mainly small, of poor quality, and undesirable for timber. Unless farm needs require use of these soils for crops or pasture, they are best used for forest.

This soil is better suited to pasture than to crops. It is cherty and is associated with steep cherty soils that are poorly suited to agriculture. Some areas are isolated and hard to reach with machines. In many places it is not practical to clear and cultivate the soil.

Under good management fair yields can be made on this soil, but in dry seasons yields will be low. A suitable rotation is cotton, rye, and vetch turned under, and common lespedeza 2 years, or sericea lespedeza 3 years. Lime and a complete fertilizer are needed for all crops. Where feasible, tillage should be on the contour, but in some areas the slopes prevent it. This soil, if cleared, should not be used frequently for cultivated crops.

Bodine cherty silt loam, eroded sloping phase (5 to 12 percent slopes) (By).—Except that this soil has a thinner surface layer, it is similar to Bodine cherty silt loam, sloping phase. From 25 to 75 percent of the original surface soil has been lost by erosion. Some places are so severely eroded that the subsoil is exposed. In many places there has been some mixing of the subsoil with the surface soil by tillage. There are many short, shallow gullies.

The surface layer is light brownish-gray to light yellowish-brown friable cherty silt loam. The subsoil is pale-brown to yellowish-brown friable cherty silt loam or light silty clay loam. In places chert occurs on the surface.

This soil is strongly acid to very strongly acid. It is permeable and is low in content of organic matter. Runoff and internal drainage are rapid, and the water-holding capacity is low.

Use and suitability (management group 7).—All of this soil has been used for crops and pasture. About 25 percent is now idle or abandoned, and some of this is reverting to forest. A small acreage is used for pastures that are mostly unimproved. The rest is used for cotton, corn, soybeans, lespedeza, and strawberries.

This soil can be used for crops, but if it is cultivated practices to control erosion are needed. Except for the chert the soil is easy to till. On many farms this soil can best be used for pasture. Crop and pasture yields are low, and good management is required to make fair yields. Even under good management, yields will be low during dry spells.

A suitable crop rotation is cotton, rye, vetch turned under, and common or sericea lespedeza grown for 2 to 4 years. Lime and a complete fertilizer are needed for all crops. If this soil is used for pasture, sericea lespedeza is a good choice. The areas that are inaccessible are best used for forest. The soil is suited to shortleaf pine and loblolly pine.

Bodine cherty silt loam, severely eroded sloping phase (5 to 12 percent slopes) (Bz).—This soil is similar to Bodine cherty silt loam, sloping phase. It differs chiefly in having a thinner surface layer. In places the subsoil is exposed. There are many short, shallow gullies and some deeper, longer gullies that are hard to cross. This soil occurs in the same general areas as other sloping Bodine soils.

The present surface layer of this soil is pale-brown to yellowish-brown friable cherty silt loam. In a few small areas it is cherty silty clay loam. In some places chert has accumulated on the surface.

Surface runoff is rapid on this soil. The water-holding capacity is low.

Use and suitability (management group 10).—All of this soil has been cultivated. About 60 percent is now idle or abandoned, and a small part is in pasture. On the rest the principal crops are cotton, corn, and lespedeza.

On many farms this soil is best used for forest. It is hard to work and is poorly suited to crops and pasture. Response to management is poor and crop failures are common. Pastures can be established, but even under good management they are hard to maintain and yields are low. This soil is suited to sericea lespedeza, but lime and a complete fertilizer are needed.

Bodine cherty silt loam, gently sloping phase (2 to 5 percent slopes) (Bv).—Except that this soil occurs on milder slopes and has slightly thicker layers, it is similar to Bodine cherty silt loam, sloping phase. Also in places it is more yellowish because of a thin capping of loess. This soil occurs in the same general areas as other Bodine soils. Most of it is in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association.

This soil has medium surface runoff. The water-holding capacity is low.

Use and suitability (management group 7).—All of this soil is in cutover forest. The stands are generally thin, the trees are small, and their market value is low. Nevertheless, areas that are small and not easily accessible are best kept in forest.

This soil is poorly suited to crops but is somewhat better suited to pasture. It is not well suited to corn and tobacco. It is better suited to crops that need little water or that grow well in cool seasons. Strawberries grow well under good management. This soil is easy to work, but the chert hinders tillage.

Where the soil is tilled, a 3- to 5-year rotation can be used if good management is practiced and erosion losses are kept to a minimum. Crops make fair response to fertilizer, but because the soil is droughty yields are uncertain.

Bodine cherty silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Bw).—Except that this soil is on milder slopes and has a thinner surface layer and thicker subsoil, it is similar to Bodine cherty silt loam, sloping phase. It occurs in the same general areas, which are mostly in the southeastern part of the county, and is also near the uneroded gently sloping and the moderately steep Bodine soils. From 25 to 75 percent of the original surface layer has been lost by erosion, and in a few small patches the subsoil is exposed. In many places tillage has mixed some of the subsoil with the surface soil.

The surface layer of this soil ranges from brownish gray to yellowish brown. This soil differs from Mountview silt loam, eroded gently sloping shallow phase, with which it is associated, in being more cherty, lighter colored, and more droughty.

In places this soil has a higher content of silt than normal, and in these places it has a more yellowish color and a more silty texture. In many places chert and quartz pebbles occur in the surface layer. This soil has a low water-holding capacity.

Use and suitability (management group 7).—All of this soil has been cultivated. An estimated 20 percent is now idle, and about 20 percent is used for pasture. Most of the rest is used for corn, cotton, lespedeza, rye, vetch, and other crops commonly grown in the county.

This soil is not well suited to corn because of the low moisture-holding capacity. It is better for cotton and grain sorghum. The row crops should be planted as early as feasible to take advantage of the moisture in the soil. The soil is well suited to sericea lespedeza. Pasture is a good use, or it is well to plant fall-seeded legumes or small grains that will grow during cool seasons. Good management is necessary to establish the pastures. If well managed, strawberries of good quality can be grown with fair success.

This soil can be used for crops, but it may not supply enough water during dry periods. The chert hinders tillage, although the soil is otherwise easy to work. If good management is practiced, a 3- to 5-year rotation can be used and erosion losses held to a minimum. Moderate amounts of lime and organic matter should be added frequently.

Bodine cherty silt loam, steep phase (25 to 65 percent slopes) (B2c).—This excessively drained soil has formed under forest from very cherty limestone. The forests were mainly oak and hickory, but there were some beech, cucumber, dogwood, gum, poplar, and sourwood trees.

This soil occurs in large areas, mostly in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association. It is in the highly dissected uplands and is associated with many of the upland soils. Most of the areas are thinly populated.

Profile description of undisturbed soil:

A thin layer of leaves, twigs, and undecomposed organic matter is on the surface.

0 to 2 inches, dark-gray, very friable cherty silt loam.

2 to 8 inches, light brownish-gray to light yellowish-brown, friable cherty silt loam.

8 to 18 inches, yellow to light yellowish-brown, friable cherty silt loam or cherty silty clay loam.

18 to 40 inches, very pale brown, friable, very cherty silt loam spotted with yellow, brown, and red; depth to bedrock is 4 feet or more.

In places on the steeper slopes, bedrock outcrops. On some of the steeper slopes, bluffs of limestone and shale

are exposed. In many places the profile consists of 6 to 12 inches of friable cherty silt loam that overlies beds of chert. In many places fragments of coarse chert occur.

This soil is strongly acid to very strongly acid, and the content of plant nutrients is low. Surface runoff is very rapid and internal drainage is rapid. The water-holding capacity is low. The soil is permeable. Except for a thin layer of leaves and forest litter on undisturbed areas, the content of organic matter is low.

Included with this soil, in a few places, are small areas of Sulphura soils and of Baxter soils that have a light-colored surface soil. Also included are a few areas in which the soil has formed from cherty limestone and the subsoil is reddish.

Use and suitability (management group 11).—All of Bodine cherty silt loam, steep phase, is forested with cutover hardwoods. This soil is not suited to crops or pasture and is best kept under forest.

Bodine cherty silt loam, eroded steep phase (25 to 65 percent slopes) (B2d).—Except that this soil is eroded, it is similar to Bodine cherty silt loam, steep phase. It occurs in the same general areas and is associated with the same soils. From 25 to 75 percent of the original surface layer has been lost through erosion, and some of the soil is even more eroded. The surface layer is generally 3 to 5 inches thick, but the thickness varies. In some places all of the surface layer and part of the subsoil have been lost. There are many short, shallow gullies and some longer, deeper gullies that cannot be crossed with farm machinery.

This soil is cherty throughout. The chert ranges in size from fine to coarse. In places it has accumulated on the surface, and on the lower slopes there are many chert drifts. In some places shale and rock outcrop.

This soil is strongly acid to very strongly acid, and the content of organic matter is low. Surface runoff is very rapid and internal drainage is rapid. The water-holding capacity is low.

Included with this soil are some small areas that have slopes that are less steep or that are steeper than those of the typical soil.

Use and suitability (management group 11).—All of Bodine cherty silt loam, eroded steep phase, has been used for crops or pasture. About 85 percent is now idle or abandoned, and most of this is covered with weeds, briars, brush, and trees. About 10 percent is used for pasture, and about 5 percent is cropped. Corn is the main crop, but cotton and sorghum are grown on some of the soil.

This soil is poorly suited to crops and pasture. It is hard to work. Yields are low and crop failures are common. The soil is best used for trees, but it is hard to get desirable kinds to grow. Shortleaf pine is best for this soil.

On some farms this soil is needed for pasture. Common lespedeza, ryegrass, and sericea lespedeza are desirable pasture plants. Lime and a complete fertilizer will be needed on the pastures. Large expenditures for seed, labor, and fertilizer are risky, however, because yields are low.

Bodine cherty silt loam, moderately steep phase (12 to 25 percent slopes) (B2a).—This soil is similar to Bodine cherty silt loam, steep phase. It differs chiefly in having thicker and more distinct soil layers. Most of it is in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association, but some of it is in the Mountview-Dickson-Lobelville soil association.

In places the surface soil contains less chert than that

of the typical profile. In these places the color is slightly browner than normal.

This soil is strongly acid to very strongly acid. Except for the thin surface layer, the content of organic matter is low. Runoff is very rapid and internal drainage is rapid. The water-supplying capacity is low. The soil is cherty throughout and is permeable.

Included with this soil are some areas in which most of the chert fragments are less than 2 inches across. The soil in these areas is browner than normal.

Use and suitability (management group 10).—All of Bodine cherty silt loam, moderately steep phase, is in cutover hardwood forest. The stands are thin, and only a few of the trees are good enough to market. Some of the forested areas are grazed. Most areas have been burned over at least once.

This soil is not suited to crops. It is best used for forest and will produce fair yields under good management. Pastures can be established but are hard to maintain even under good management. During dry periods yields will be low.

Bodine cherty silt loam, eroded moderately steep phase (12 to 25 percent slopes) (B2b).—Except that this soil is on milder slopes and has a thinner surface layer, it is similar to Bodine cherty silt loam, steep phase. Most of it has lost from 25 to 75 percent or more of the original surface soil through erosion. In many small spots the subsoil is exposed, and in many places tillage has mixed part of the subsoil with the surface soil.

There are short, shallow gullies, in places, and some deeper, longer gullies that are hard to cross. In some places chert has accumulated on the surface.

The surface soil is brownish gray to light yellowish brown. The subsoil is very pale brown to yellowish brown. This soil is cherty throughout. It has variations similar to other moderately steep and steep Bodine soils.

This soil is strongly acid to very strongly acid. It is low in organic matter. Runoff is very rapid and internal drainage is rapid. The water-holding capacity is low. This soil is permeable. The erosion hazard is high.

Use and suitability (management group 10).—All of this soil has been used for crops or pasture. Most of it is now idle, abandoned, or in unimproved pasture. Some of it is reverting to forest. A few areas are in improved pasture, and between 10 and 15 percent is used for crops, principally corn, cotton, and lespedeza.

This soil is poorly suited to crops. The chert and strong slopes hinder tillage and prevent the efficient use of heavy farm machinery. Where crops must be grown, long rotations are required and contour tillage is needed. Terraces generally should not be used on this soil.

This soil is best used for pasture or forest. It is fairly well suited to pasture, but yields are low. The soil is suited to sericea lespedeza, and whiteclover and orchardgrass can be grown under good management. Lime and a complete fertilizer are needed for all crops and for pasture.

The most severely eroded areas should be planted to trees. The trees to which the soil is best suited are loblolly and shortleaf pines. Some species, such as locust, are hard to establish.

Bodine fine cherty silt loam, eroded gently sloping phase (2 to 5 percent slopes) (B2e).—Except that this soil is browner and contains smaller chert fragments, it is similar to Bodine cherty silt loam, eroded gently sloping

phase. It occupies upland ridges above the moderately steep and steep phases of Bodine cherty silt loam. Most of it is in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association near the community of Pea Ridge. This soil is moderately eroded. There has been some mixing of the subsoil with the surface soil.

This excessively drained soil has formed under forest from very cherty limestone. The trees were chiefly oak and hickory. Most of the chert fragments in the surface layer of this soil are less than 1 inch in diameter, but there are larger fragments on the surface of some areas.

Profile description:

- 0 to 6 inches, light yellowish-brown, gritty friable fine cherty silt loam; contains numerous chert fragments, most of them $\frac{1}{4}$ to $\frac{3}{4}$ inch in diameter.
- 6 to 20 inches, yellow to brown, gritty, friable fine cherty silt loam; contains numerous chert fragments, most of them less than $\frac{3}{4}$ inch in diameter.
- 20 to 42 inches +, reddish-yellow, yellowish-red, or reddish-brown material consisting of compact beds of fine chert fragments and gritty, friable silty clay loam; in places mottled with light gray; this layer is several feet thick and the chert layers are several inches thick.

In some places there is a thin capping of loess. The color of the surface soil is in places light gray. In many places the subsoil is somewhat cemented at depths of 10 to 18 inches.

This soil is strongly acid to very strongly acid. Runoff is medium and internal drainage is rapid. The moisture-supplying capacity is low.

Included with this soil are some areas that are not cleared or eroded. The soil in these places has a thin cover of leaves and forest litter. In contrast to the typical soil, the surface layer in these areas is thicker, contains slightly less chert, and is darker in the topmost inch or two. Also included are some areas in which there is a red, very cherty subsoil, mottled with yellow and gray. A few areas of the shallow phases of Mountview soils, too small to be mapped separately, are included with this soil.

Use and suitability (management group 7).—Most of Bodine fine cherty silt loam, eroded gently sloping phase, has been used for crops or pasture, but about 10 percent is now idle or abandoned. The principal crops are cotton, corn, lespedeza, vetch, soybeans, and small grains.

This soil is fairly well suited to crops and pasture. Yields are low, however, particularly in dry seasons. This soil is best suited to drought-resistant crops and to small grains and pasture. Under good management cotton can be grown in fairly short rotations and permanent pastures can be established and maintained. This soil is well suited to common and sericea lespedeza. Lime and a complete fertilizer are needed for all crops and pasture.

Bodine fine cherty silt loam, eroded sloping phase (5 to 12 percent slopes) (B2f).—Except that this soil has stronger slopes, it is similar to Bodine fine cherty silt loam, eroded gently sloping phase. It occupies similar locations and is associated with the same soils.

The surface layer is light brownish-gray to light yellowish-brown friable fine cherty silt loam that is very light colored when dry. Small areas of browner or redder soil material are exposed.

This soil is strongly acid to very strongly acid. Its content of organic matter is low. Runoff and internal drainage are rapid, and the water-holding capacity is low.

In many places there are short, shallow gullies and rills that can be smoothed over by tillage.

Included with this soil are some uneroded areas that have not been cleared. The surface soil in these places has a thin cover of forest litter and is thicker and less cherty than that of the typical soil. Also included are a few severely eroded areas. In these places 75 percent or more of the surface soil has been lost by erosion and the soil is browner in color and contains more chert than the typical soil.

Use and suitability (management group 7).—All of Bodine fine cherty silt loam, eroded sloping phase, has been used for crops or pasture. About 20 percent is now idle, and about 10 percent is in unimproved pasture. The rest is used mostly for corn, cotton, common lespedeza, soybeans, and small grains.

This soil is fairly well suited to crops and pasture. It is easy to work, but if it is used for crops, contour tillage is needed. A suitable rotation is cotton, rye, vetch turned under, and sericea lespedeza for 3 to 4 years. Under good management pastures can be established and maintained, but yields will be lower in dry years. Lime and a complete fertilizer are needed for all crops and for pasture. The areas of this soil that are not easily accessible or that have slopes unsuited to contour tillage are best used for forest.

Captina silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Cb).—This moderately well drained soil is on stream terraces. It has formed under a hardwood forest, chiefly oak and hickory. The soil occurs in the valleys of creeks in the same general areas as Bodine, Ennis, Etowah, Lobelville, Robertsville, and Taft soils, but it is mainly in the Ennis-Humphreys-Etowah-Captina soil association. In contrast to the Bodine soil, it is free of chert in most places. This soil is better drained and is not so gray and is less mottled than the Robertsville and Taft soils. It is not so well drained as the Etowah soils, which lack the fragipan layer and are reddish in the lower part of the profile. The Ennis and Lobelville soils, unlike this soil, have formed from young mixed alluvium, do not have a fragipan, and have soil layers that are not so well developed.

This soil has formed from old mixed alluvium washed mainly from soils that are underlain by cherty limestone. In places it is similar to the Paden soils, which are not mapped in this county. There is a thin capping of loess in many places.

Most of this soil has been eroded, and there has been considerable mixing of the subsoil with the surface soil. The present surface layer varies in color, texture, and thickness.

Many small areas of this soil are at the bases of slopes occupied by Bodine, Dickson, and Mountview soils. The soil in these places has formed from local alluvium washed from the slopes. The surface layer in some of these areas is dark brown and about 7 inches thick.

Profile description:

- 0 to 6 inches, brownish-gray to yellowish-brown very friable silt loam.
- 6 to 26 inches, yellow to yellowish-brown friable to firm silty clay loam; has a few mottles of gray, light yellow, and rust in the lower part; moderate medium blocky structure.
- 26 to 40 inches (fragipan), mottled light-gray, pale-yellow, and strong-brown fine silt loam; compact in places; grades to mottled cherty silty clay loam at depths of $3\frac{1}{2}$ to 5 feet.

In many places this soil rests on chert beds or shale at depths between 4½ and 6 feet. In many places chert fragments or pebbles occur throughout the profile. The fragipan layer ranges in texture from silt loam to silty clay loam and in thickness from 8 to 18 inches. In a few places the fragipan layer is friable silt loam that is 6 to 8 inches thick. The depth to the fragipan layer ranges from 26 to 40 inches.

This soil is strongly acid to very strongly acid. The content of organic matter is moderately low. Surface runoff is medium, and internal drainage is medium to slow. The water-holding capacity is moderate. The surface layer and upper subsoil are permeable, but the fragipan layer is only slightly permeable.

Use and suitability (management group 5).—Most of this soil is used for crops, but some is pastured and a small part is idle. It is well suited to pasture and to cotton, corn, small grains, common lespedeza, soybeans, red clover, sericea lespedeza, and most of the other crops commonly grown in the county. It is not well suited to alfalfa. The soil is easy to work, but the fragipan limits its use. Short crop rotations are needed. For good yields lime and a complete fertilizer must be used for all crops and for pasture.

Captina silt loam, gently sloping phase (2 to 5 percent slopes) (Ca).—Except that this soil is on milder slopes and has a thicker surface layer, it is similar to Captina silt loam, eroded gently sloping phase. It occurs in similar locations and is associated with the same soils.

The surface layer ranges from 6 to 10 inches in thickness. In forested areas there is a thin cover of leaves and forest litter on the surface. In a few places the surface layer is brown. On about a third of this soil, the slopes are between 0 and 2 percent.

This soil is strongly acid to very strongly acid. The content of organic matter is low. Surface runoff is medium to slow, and internal drainage is medium. In the soil above the fragipan, the water-holding capacity is moderate.

Use and suitability (management group 5).—About 65 percent of this soil is in cutover forest. Most of the rest is used for cotton, corn, soybeans, lespedeza, sorghum, rye, and vetch.

This soil is well suited to pasture and to most of the crops commonly grown in the county. It is well suited to sericea lespedeza, but it is not suited to alfalfa. The soil is easy to work. It can be used the same as Captina silt loam, eroded gently sloping phase, but it responds somewhat better to management. A suitable crop rotation consists of 1 year of row crops to 3 years of close-growing crops. Lime and a complete fertilizer are needed for best yields.

Captina silt loam, eroded sloping phase (5 to 12 percent slopes) (Cc).—Except that this soil has stronger slopes, a thinner surface layer, and a fragipan layer at more variable depths, it is similar to Captina silt loam, eroded gently sloping phase. It occurs throughout the county, but most of it is near Bodine soils or near the Pace and other Captina soils in the Ennis-Humphreys-Etowah-Captina soil association. There are some short, shallow gullies.

About a third of this soil has lost most of the surface soil and part of the subsoil through erosion. In these places the subsoil is exposed and is browner than that of the typical soil. There are also a greater number of

gullies. The fragipan is more variable in depth and thickness than that in Captina silt loam, gently sloping phase, and in places it is only 6 to 10 inches thick. There are a few small cherty areas and some areas that are not eroded.

This soil is strongly acid to very strongly acid. The content of organic matter is moderately low. Surface runoff is rapid and internal drainage is medium. The water-holding capacity is moderate. The soil above the fragipan layer is permeable.

Use and suitability (management group 6).—Most of this soil has been used for crops and pasture. About 20 percent is now idle, and 20 percent is in pasture. The rest is used for cotton, corn, lespedeza, soybeans, rye, and vetch.

This soil is suited to most of the crops commonly grown in the county such as cotton, small grains, common lespedeza, red clover, sericea lespedeza, and vetch. It is not suited to corn but is fairly well suited to pasture. The soil is easy to work, but yields are low under ordinary management. Row crops on this soil are best grown in a 3- to 6-year rotation. Contour tillage and contour strip-cropping are needed to conserve moisture and control erosion. Lime and a complete fertilizer are needed for all crops and pastures.

The severely eroded areas are hard to work and are more droughty and less productive than the rest of this soil. Areas that are small and inaccessible are best used for forest.

Cherty alluvial land (0 to 5 percent slopes) (Cd).—This miscellaneous land type occurs on bottom lands in areas of irregular shape that roughly parallel the stream channels. In a few places it has slopes of 6 to 7 percent. It occurs in the same general areas as the Ennis and Lobelville soils. The cherty stream rubble making up this land type consists mostly of chert fragments that are up to 6 inches in diameter, but some cobbles and small pebbles are included. On some uncleared areas there is a thin stand of bottom-land hardwoods.

Use and suitability (management group 11).—Cherty alluvial land is poorly suited to crops, pastures, or trees. Some areas that are already in forest are best used for that purpose, but reforestation would be difficult. This land is hard to work and is droughty. Crop failures are so common that it is risky to spend money on labor or fertilizer. Some of the land is in wild pasture, but yields are uncertain because brush rapidly encroaches. This land is a good source of road material, particularly if washed chert is needed. Many of the areas are small and irregular and are therefore best used with the land they adjoin.

Cookeville silt loam, gently sloping phase (2 to 5 percent slopes) (Ce).—This well-drained soil occurs on uplands throughout the county. Most of it is in the Bewleyville-Cookeville-Baxter-Greendale and the Pembroke-Decatur-Emory soil associations. In contrast to the Bewleyville soils, it has a thinner layer of loess, is redder in color, and contains more chert. This soil is not so cherty as the Baxter soils but has a browner surface layer and a redder subsoil. Its surface layer is lighter colored than that of the Decatur and Pembroke soils, and its subsoil is lighter red and more friable. The parent material is weathered cherty limestone that in some places is capped by a 10- to 20-inch layer of loess.

Profile description of undisturbed soil:

- A thin layer of leaves and other forest litter is on the surface. 0 to 7 inches, brown very friable silt loam; contains a few chert fragments up to 1 inch in diameter.
- 7 to 17 inches, yellowish-red friable silty clay loam; contains some chert fragments up to 1 inch in diameter; weak medium blocky structure.
- 17 to 22 inches, dark-red, firm cherty silty clay loam.
- 22 to 72 inches +, yellowish-red to dark-red, firm to very firm or compact cherty silty clay loam or cherty silty clay streaked with yellow; contains chert fragments up to 6 inches in diameter and a few pebbles; strong medium subangular blocky structure.

This soil is medium acid to strongly acid. It has a moderate supply of plant nutrients and organic matter. Surface runoff is medium, and the water-holding capacity is moderate to high. The soil is permeable.

In places the surface soil contains a few chert fragments up to 2 inches in diameter and small pebbles of quartz and chert. The surface soil ranges from light yellowish brown to dark brown in color, and the subsoil, from brown to dark red. In a few places, between depths of 18 and 20 inches, the subsoil is compact cherty silty clay. The surface soil and the upper subsoil in some places contain fine sand.

Use and suitability (management group 3).—This soil is all in hardwood forest made up chiefly of small- to medium-sized oak and hickory trees. The areas that are somewhat isolated and inaccessible are best left in forest. This soil, however, is well suited to crops and pasture and could be used and managed the same as the Bewleyville soils.

Cookeville silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Cf).—Except that this soil has a thinner surface layer, it is similar to Cookeville silt loam, gently sloping phase. It occurs throughout the county in association with Baxter, Bewleyville, Bodine, Decatur, and Mountview soils, and with other Cookeville soils. It occupies many small knolls within areas of Mountview soils. Much of the surface soil has been lost by erosion, and there has been considerable mixing of the subsoil with the plow layer. The present surface soil is light yellowish brown to yellowish red.

This soil is medium acid to strongly acid. It has a moderate content of organic matter. Surface runoff and internal drainage are medium, and the water-holding capacity is high. The soil is permeable.

In many small, severely eroded areas, the reddish-yellow to dark-red, firm silty clay loam is exposed. In many places a small amount of chert occurs throughout the profile.

Included with this soil are a few small areas of cherty silt loam. These are designated on the soil map by chert symbols.

Use and suitability (management group 3).—This soil has all been used intensively for row crops and pasture. An estimated 65 percent is now used for crops, chiefly corn, cotton, small grains, soybeans, and common lespedeza. About 25 percent is used for pastures, some of which are improved, and about 10 percent is idle.

This soil is well suited to tree fruits and to all the crops commonly grown in the county, as cotton, small grains, orchardgrass, white clover, and crimson clover. Alfalfa and red clover grow well under good management. The soil is easy to work, and yields are good, even under ordinary management. Two- to four-year rotations are well suited, and winter cover crops should be used in these

rotations. Lime and a complete fertilizer are needed to maintain high yields.

Cookeville silt loam, sloping phase (5 to 12 percent slopes) (Cg).—Except that this soil is on stronger slopes and has slightly thinner layers, it is similar to Cookeville silt loam, gently sloping phase. It occupies small areas throughout the county in association with the Baxter, Bewleyville, Bodine, and Mountview soils, and with other Cookeville soils.

This soil is medium acid to strongly acid. The content of organic matter is moderate. Surface runoff is rapid and internal drainage is medium. The water-supplying capacity is high.

Use and suitability (management group 4).—All of this soil is in cutover forest. The trees are mainly oak, hickory, and poplar, but there are many other kinds. A few areas of this soil are isolated by hilly and steep cherty soils, and these are best left in forest.

This soil is well suited to all the crops commonly grown in the county. It is also well suited to pasture and particularly to such pasture plants as orchardgrass and whiteclover. If tilled, it is best used in a rotation in which row crops are grown only once in 3 to 5 years. Contour tillage, contour strip cropping, and, in some places, terracing will be needed to control erosion and to hold moisture in the soil. On some farms this soil is best used for small grains, winter legumes, and common lespedeza grown in various rotations. Alfalfa can be grown in a long rotation. Lime and a complete fertilizer are needed for all crops and pasture.

Cookeville silt loam, eroded sloping phase (5 to 12 percent slopes) (Ch).—Except that this soil has stronger slopes and thinner soil layers, it is similar to Cookeville silt loam, gently sloping phase. It occurs in similar locations and is associated with the same soils. From 25 to 75 percent of the original surface soil has been lost through erosion. There has been considerable mixing of the subsoil with the surface soil.

The present surface soil is light yellowish-brown to yellowish-red friable silt loam. The subsoil ranges from brown to dark-red firm silty clay loam or cherty silty clay loam. There are some short, shallow gullies.

This soil is medium acid to strongly acid. It is permeable, and the content of organic matter is moderate to low. Surface runoff is rapid and internal drainage is medium. The water-holding capacity is high.

In the places where erosion has been uneven, the color of the surface soil ranges from light yellowish brown to dark red. Where all the surface soil has been lost by erosion, the present surface soil is brown to dark-red firm silty clay loam.

Included with this soil are a few small areas of cherty silt loam. These are indicated on the soil map by chert symbols.

Use and suitability (management group 4).—All of Cookeville silt loam, eroded sloping phase, has been used intensively for crops and pasture. About 55 percent is now used for crops, chiefly cotton, corn, small grains, common lespedeza, and vetch. About 30 percent is in pasture, and the rest is idle.

This soil is well suited to pasture and to all the crops commonly grown in the county, particularly to small grains, winter legumes, orchardgrass, and whiteclover. Careful management is needed, however, to protect it from erosion. A rotation in which a row crop is grown

only once in 4 to 6 years is best. Contour tillage is needed to control erosion and to hold moisture in the soil. On some slopes contour stripcropping and terracing will be required. Lime and a complete fertilizer are needed to maintain high yields.

Cookeville silty clay loam, severely eroded sloping phase (5 to 12 percent slopes) (Ck).—Except that this soil has stronger slopes, is clayey, and has a thinner surface layer, it is similar to Cookeville silt loam, gently sloping phase. It occurs in the same general areas and is associated with the same soils.

About 75 percent or more of the original surface soil has been lost through erosion and part of the subsoil as well. Tillage has mixed part of the subsoil with the surface soil, and the present surface soil is a yellowish-brown to dark-red firm to friable silty clay loam. The subsoil is brown to dark-red firm silty clay loam or cherty silty clay loam. There are many short, shallow gullies. In a few small places, the compact silty clay is exposed. There are a few small cherty areas.

This soil is medium acid to strongly acid. The content of plant nutrients and organic matter is low. Surface runoff is rapid and internal drainage is medium. The soil has a low water-holding capacity. The erosion hazard is high.

Use and suitability (management group 4).—All of this soil has been used for crops and pasture. About 50 percent is now used for crops, chiefly cotton, corn, rye, lespedeza, and vetch. About 25 percent is in pasture, mainly unimproved, and the rest is idle.

This soil is suited to a number of crops and to permanent pasture. It is suited to small grains, common lespedeza, sericea lespedeza, red clover, and alfalfa, but it is best suited to the long-lived, deep-rooted crops. The soil is fairly easy to work, but yields are low under ordinary management. Careful management is needed to prevent further erosion and to conserve moisture. A rotation that includes legumes and grasses is required, and tillage on the contour is needed. A suitable rotation is cotton, rye and vetch turned under, and sericea lespedeza. Lime and a complete fertilizer are needed for best yields.

Decatur silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Da).—This well-drained upland soil has formed under a hardwood forest. Most of it is in the Pembroke-Decatur-Emory soil association, but some is in the Bewleyville-Cookeville-Baxter-Greendale soil association. This soil has a less silty surface layer and a firmer subsoil than the Bewleyville and Pembroke soils. It differs from the Cookeville soils in being redder, finer textured, firmer, and deeper to bedrock. The parent material of this soil is mostly weathered products of chert-free limestone that in many places is capped with 10 to 20 inches of loess.

Profile description of a cleared area:

- 0 to 6 inches, brown to light reddish-brown friable silt loam; weak fine granular to crumb structure.
- 6 to 18 inches, light reddish-brown to red firm silty clay loam; lower part is redder and firmer in consistence; strong medium subangular blocky structure.
- 18 to 48 inches, dusky-red compact silty clay; some grayish streaking; contains some angular chert fragments; strong medium to coarse subangular blocky structure; depth to bedrock, in most places, is 20 feet or more.

This soil is medium acid to strongly acid. Its content of organic matter is low. Surface runoff and internal

drainage are medium. The soil has a moderate water-supplying capacity and is moderately permeable.

A few uneroded areas of this soil have a very friable surface layer that is 8 to 10 inches thick. In some places the subsoil is yellowish red.

Included with this soil are some small areas of Decatur silty clay loam and of Pembroke silt loam. Decatur silty clay loam has a red to dusky-red surface soil of compact silty clay loam and is harder to work than the silt loam areas that surround it.

Use and suitability (management group 3).—Most of Decatur silt loam, eroded gently sloping phase, is used for crops and pasture. Only a small part is idle.

This soil is well suited to all the crops commonly grown in the county. It is also well suited to tree fruits and pasture. The soil is easy to work and responds well to management, so it can well be used for tilled crops. Under good management alfalfa can be grown for 4 years or longer. A rotation in which a row crop is grown once in 2 or 3 years is best. Contour tillage is needed to control erosion, and on some slopes terracing will be needed. Lime and a complete fertilizer are needed for best yields, particularly for alfalfa.

Decatur silt loam, eroded sloping phase (5 to 12 percent slopes) (Db).—Except that this soil has stronger slopes, it is similar to Decatur silt loam, eroded gently sloping phase. It occurs in association with Pembroke soils and other Decatur soils. Most of it is in the Pembroke-Decatur-Emory soil association. From 25 to 75 percent of the original surface soil has been lost by erosion. There has been some mixing of the subsoil with the surface soil. In a few places small patches of the red, firm silty clay subsoil are exposed.

The present surface soil is brown, dark-brown, or dark reddish-brown friable silt loam. The subsoil is reddish-brown to dark-red firm silty clay. In places there are small, yellow, angular chert fragments on the surface and in the subsoil.

This soil is medium acid to strongly acid. Its content of organic matter is moderate. Surface runoff is medium to rapid, and internal drainage is medium. The soil has a high water-holding capacity. Permeability is rapid.

Use and suitability (management group 4).—This is one of the best soils in the county for crops. Most of it is used for crops, mainly cotton, corn, small grains, crimson clover, alfalfa, and vetch. A small part is pastured. Only a small acreage is idle.

Although this soil is easy to work and crops make good yields, careful management is needed to prevent further erosion and to maintain good tilth. It is well suited to all the crops commonly grown in the county, including alfalfa, red clover, white clover, and orchardgrass. Under good management it can be used intensively for small grains, winter legumes, and common lespedeza, which will make excellent yields. Tillage on the contour is needed. Lime and a complete fertilizer are required for best yields.

Decatur silty clay loam, severely eroded gently sloping phase (2 to 5 percent slopes) (Dc).—Except that this soil has lost practically all of the original surface soil through erosion, it is similar to Decatur silt loam, eroded gently sloping phase. It occurs chiefly in the Pembroke-Decatur-Emory soil association. The present surface layer is the exposed former subsoil of red to dusky-red compact silty clay loam or silty clay. Some small, less eroded patches are reddish brown.

This soil is medium acid to strongly acid. It is permeable. Surface runoff and internal drainage are medium. The water-supplying capacity is high.

Included with this soil are a few cherty areas. These are indicated on the soil map by chert symbols. The subsoil in these places is dusky red to very dusky red compact silty clay.

Use and suitability (management group 3).—Most of this soil is used for crops or pasture. Only a small acreage is idle.

This soil is well suited to all of the crops commonly grown in the county, including alfalfa. If alfalfa is to maintain good yields for several years, however, lime and a complete fertilizer are required. Contour tillage and moderately short crop rotations are needed to prevent further erosion and to keep moisture in the soil. On many farms this soil is best used for pasture or hay grown in fairly long rotations.

Decatur silty clay loam, severely eroded sloping phase (5 to 12 percent slopes) (Dd).—Except that this soil has stronger slopes and is more eroded, it is similar to Decatur silt loam, eroded gently sloping phase. In a few areas it is on slopes of as much as 25 percent. This soil occurs in association with other Decatur soils. Most of it is in the Pembroke-Decatur-Emory soil association. Nearly all of the surface soil has been lost by erosion, and the clayey subsoil is exposed. In some places part of the subsoil has been washed away. Short, shallow gullies are common.

The present surface soil is compact, reddish-brown to dusky-red silty clay loam or silty clay. The subsoil is compact, dusky-red silty clay or clay. There are a few small, yellow, angular chert fragments on the surface and in the subsoil.

This soil is medium acid to strongly acid. The content of organic matter is low. Surface runoff is rapid and internal drainage is medium. The water-supplying capacity is low.

Included with this soil are a few cherty areas. These are designated on the soil map by chert symbols. The chert in these places hinders tillage.

Use and suitability (management group 4).—All of this soil has been cultivated. Most of it is now used for crops and pasture, but yields are low. Some of the soil has been abandoned.

This soil is hard to work and can be tilled only within a narrow range of moisture content. The surface soil packs easily and moisture infiltrates slowly. Consequently, runoff is rapid and the erosion hazard is high.

This soil is only fairly well suited to row crops but is better suited to pasture. Alfalfa can be grown under good management. Long crop rotations, contour tillage, and stripcropping are needed to control erosion and conserve moisture. In some places it would be well to use terraces. Lime and a complete fertilizer are needed for all crops and for pasture. On farms where less sloping and more easily worked soils are available for crops, this soil can best be used for pasture.

Dickson silt loam, gently sloping phase (2 to 5 percent slopes) (De).—This moderately well drained soil has formed under a hardwood forest. The native trees were chiefly blackjack, post, red, and white oaks, hickory, gum, and dogwood. The parent material is a 20- to 42-inch layer of loess that overlies cherty limestone residuum. This soil occurs mostly on the broad uplands in the Dickson-Lawrence-Guthrie soil association. Some small

areas are near the Sango soils on the broader ridges in many parts of the county.

This soil has slightly steeper slopes and better natural drainage than the Guthrie, Lawrence, and Sango soils. It is similar to the Mountview soils but has a fragipan layer and occupies milder slopes.

Profile description of undisturbed soil:

- A thin layer of leaves and forest litter is on the surface.
- 0 to 6 inches, brownish-gray to light yellowish-brown very friable silt loam; upper part is stained with organic matter.
- 6 to 22 inches, yellow to light yellowish-brown friable silt loam to silty clay loam, mottled in lower part with yellow and gray; moderate to weak medium blocky structure.
- 22 to 32 inches (fragipan), compact heavy silt loam mottled with light gray, light yellowish brown, rust brown, strong brown, and yellow; contains some chert fragments.
- 32 to 40 inches+, mottled pale-yellow, light-gray, and light-red compact silty clay loam; contains some angular chert; has some seams and veins of gray silt; moderate medium blocky structure.

In some places the fragipan is in the underlying cherty residuum. In a few places it is as shallow as 20 inches. In places the substratum is 8 to 10 feet thick and is chertier with depth.

This soil is strongly acid to very strongly acid. Its content of plant nutrients and organic matter is moderately low to low. Surface runoff is slow, and internal drainage is medium to slow. The water-holding capacity is moderate in the soil above the fragipan.

The upper layers of this soil are readily permeable, but the fragipan is very slowly permeable. Because water moves through the fragipan slowly (fig. 2), the layer below the pan is frequently dry when the layers above the pan are wet. In spring, the upper layers are usually saturated. In summer, when the upper layers are dry, the fragipan keeps plant roots from obtaining water in the moist soil below. Root systems develop almost entirely above the fragipan layer.

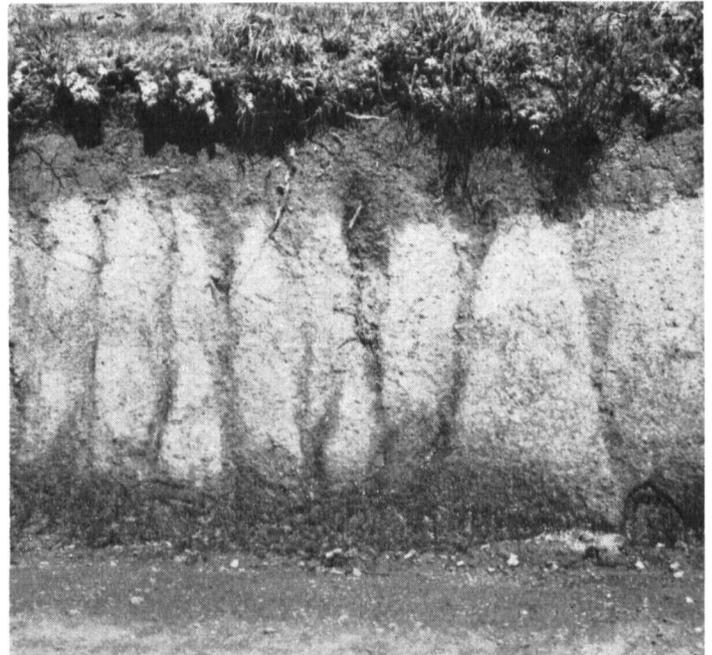


Figure 2.—Profile of Dickson silt loam, gently sloping phase, showing the depth of moisture penetration on the day following a rain. The slowly permeable pan was dry.

Use and suitability (management group 5).—This soil is nearly all in cutover forests, but some of it is cleared each year. Trees grow slowly.

This soil is fairly well suited to many of the crops commonly grown in the county. It is easy to work but is often either too wet or too dry for tillage. Yields are only moderate under ordinary management but increase if good management is used. This soil is better suited to cotton than corn and is suited to sericea lespedeza and red clover. It is not well suited to alfalfa, although some alfalfa is grown. Short crop rotations and contour tillage are needed to control erosion. Lime and a complete fertilizer are required for best yields.

Dickson silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Df).—Except that this soil is eroded and has a thinner surface layer, it is similar to Dickson silt loam, gently sloping phase. Most of it is in the Dickson-Lawrence-Guthrie soil association, but many large areas occur throughout the county on broad upland ridges. Much of the surface soil, including the thin topmost layer high in organic matter, has been lost by erosion. There has been some mixing of the subsoil with the surface soil. In a few small, severely eroded places, the subsoil is exposed.

The present surface soil is brownish-gray to light yellowish-brown silt loam. The subsoil, a yellow to light yellowish-brown silt loam or silty clay loam, is underlain by a fragipan at depths between 20 and 30 inches.

This soil is strongly acid to very strongly acid. The content of organic matter is low. Surface runoff is slow and internal drainage is moderately slow. The water-holding capacity is moderate. This soil is rapidly permeable above the fragipan, but the fragipan is slowly permeable.

Use and suitability (management group 5).—All of this soil has been used for crops and pasture. From 5 to 10 percent is now idle. The principal crops are cotton, corn, tobacco, soybeans, lespedeza, small grains, vetch, and sorghum, but yields are only moderate. There are some permanent pastures.

This soil is easy to work. It is fairly well suited to pasture and to most of the crops commonly grown in the county, as grain sorghum, common lespedeza, cotton, small grains, and soybeans. It is well suited to rye, vetch, and sericea lespedeza but is not well suited to corn, alfalfa, and tree fruits. Lime and a complete fertilizer are required.

Dickson silt loam, eroded gently sloping dark brown surface phase (2 to 5 percent slopes) (Dh).—This is a moderately well drained soil of the uplands. Except that it is darker in color and the layer of loess overlies either cherty or chert-free limestone materials, it is similar to Dickson silt loam, gently sloping phase. Most of this soil is in the Pembroke-Decatur-Emory soil association near areas of Pembroke, Decatur, and Guthrie soils. It is also associated with Bewleyville and Cookeville soils.

Profile description:

- 0 to 7 inches, yellowish-brown to dark-brown, very friable silt loam.
- 7 to 17 inches, yellowish-brown to strong-brown, friable coarse silty clay loam with a few mottles of rust brown or black in the lower part; weak to moderate medium blocky structure.
- 17 to 24 inches, yellowish-brown, friable coarse silty clay loam with fine mottles of pale yellow, gray, and rust; contains

many soft, dark concretions $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter; moderate medium blocky structure.

- 24 to 34 inches (fragipan), mottled light-gray, pale-yellow, strong-brown, and dark-gray firm silty clay loam; compact in place; contains many soft, dark concretions.
- 34 to 48 inches+, mottled red, pale-yellow and light-gray firm silty clay loam to silty clay; compact in place; contains a few to many large, dark, soft concretions about $\frac{1}{2}$ inch in diameter and some angular chert; chert fragments become more numerous with depth; moderate subangular blocky structure.

In places the subsoil is moist in winter but, in contrast to nearby areas of Dickson silt loam, gently sloping phase, it does not become saturated. In many places the fragipan layer is weaker and thinner than in the typical soil. In some places the pan consists largely of black concretions that are about one-half inch in diameter. In a few places the fragipan occurs at a depth of about 20 inches. In places the soil has formed over chert-free limestone, and here the subsoil is browner than typical and there is a thinner pan. The pan contains a greater number of concretions and, at a depth of about 32 inches, grades to silty clay loam.

This soil is strongly acid to very strongly acid. The content of plant nutrients and organic matter is moderate. Surface runoff is medium and internal drainage is slow. The water-holding capacity is moderate, but as roots cannot penetrate the pan readily, the water available to plants is limited.

Included with this soil are a few areas of Lawrence silt loam, brown variant, that are too small to map separately. Also included are a few areas in which the soil is not eroded and in which the surface soil is thicker than normal.

Use and suitability (management group 5).—Most of this soil is used for crops and pasture, and yields are moderate. Only a small acreage is idle.

This soil is fairly well suited to pasture and to most of the crops commonly grown in the county, but it requires careful management. It is easy to work. The soil is better suited to cotton than to corn. It is well suited to small grains, but it is not well suited to alfalfa. A short crop rotation can be used, but contour tillage is needed to control erosion. Lime and a complete fertilizer are required for best yields.

Dickson silt loam, level dark brown surface phase (0 to 2 percent slopes) (Dg).—Except that this soil is nearly level and has a somewhat thicker surface layer, it is similar to Dickson silt loam, eroded gently sloping dark brown surface phase. The surface soil is between 6 and 9 inches thick, and in undisturbed areas there is a thin layer of leaves and forest litter. In a few places the soil is lighter in color than the typical soil.

This soil is strongly acid to very strongly acid. Its content of organic matter is moderate. Surface runoff and internal drainage are slow. The water-holding capacity is moderate.

Included with this soil are a few small areas in which the soil is imperfectly drained.

Use and suitability (management group 5).—Most of this soil is in cutover forest of oak and hickory trees. The cleared areas are used intensively for crops, chiefly corn, cotton, and soybeans.

This soil is fairly well suited to pasture and to most of the crops commonly grown in the county, but its use is limited by slow internal drainage. It is well suited to white clover, Ladino clover, and sericea lespedeza but is

not well suited to alfalfa. The soil is easy to work, and yields are moderate. Short crop rotations can be used under good management, and little soil will be lost through erosion. If surface drainage is improved, yields will be increased and strawberries can be grown. Crops on this soil respond fairly well to applications of lime and a complete fertilizer.

Emory silt loam (0 to 5 percent slopes) (Ea).—This well-drained soil has formed from material recently washed from soils formed from a thin layer of loess over high-grade, chert-free limestone. Locally, it is known as "made land." Its slopes are mainly between 2 and 5 percent. Most of this soil occurs in long, narrow areas, in depressions, or along the bases of slopes occupied by Bewleyville, Cookeville, Decatur, Etowah, or Pembroke soils. Some of it is in sinkholes or depressions that do not have a surface outlet. This soil is chiefly in the Pembroke-Decatur-Emory soil association.

This is a young soil and has not had time to develop a distinct surface layer or subsoil. In some places the recent alluvium is shallow and is underlain by firm, red silty clay loam at depths of 18 to 40 inches. This soil differs from the Greendale soils in being red rather than yellow and in being free of chert.

Profile description:

- 0 to 28 inches, brown to very dark brown, very friable silt loam; very weak very fine crumb structure.
- 28 to 40 inches +, dark reddish-brown to dark-brown friable heavy silt loam; weak to moderate very fine crumb structure.

In a few places this soil is faintly mottled below a depth of 24 inches. In some places the profile has developed to the extent that there is a weak contrast between the surface layer and subsoil. In these places the subsoil is brown or reddish-brown friable coarse silty clay loam. In some places this soil is shallower than the typical profile, and here it is underlain by firm red silty clay loam.

This soil is medium acid. Its content of plant nutrients and organic matter is moderate. Permeability is rapid, and the water-supplying capacity is high. Surface runoff and internal drainage are medium.

Use and suitability (management group 2).—Nearly all of this soil is used for crops and pasture. It is easy to work and is used for all of the crops commonly grown in the county. As most of it occurs in small irregular shapes too small to be farmed separately, it is used the same as adjoining soils. This soil is well suited to tilled crops and pasture. It can be used intensively for row crops and is particularly well suited to corn and to summer pasture. Much of it will need improved surface outlets for strawberries, small grains, alfalfa, or orchardgrass to grow well.

Ennis silt loam (0 to 3 percent slopes) (Ec).—This well-drained soil occurs on nearly level flood plains. It has formed from material washed mostly from upland soils underlain by cherty limestone. Some of these upland soils were formed partly from a thin layer of loess, so the parent material of this soil contains some loess.

This soil occurs along the larger streams in all parts of the county. Much of it is along Buffalo River, Shoal Creek and its tributaries, and Sugar Creek. Many of the narrower areas are used along with nearby soils such as the Greendale and Humphreys. This soil is mostly in the Ennis-Humphreys-Etowah-Captina soil association.

It is associated with Ennis cherty silt loam, with the Lee and Lobelville soils of the bottom lands, and with Humphreys and Taft soils of adjoining low terraces or second bottoms. The soil is better drained and browner than the Lee and Lobelville soils. In contrast to the Humphreys soils, it is on first bottoms, its profile is not so well developed, and it has a more friable, less clayey subsoil.

Profile description:

- 0 to 8 inches, grayish-brown to very dark brown, very friable silt loam.
- 8 to 24 inches, brown to dark-brown friable silt loam, faintly spotted with gray in lower part; contains an occasional angular chert fragment.
- 24 to 36 inches +, dark-brown, very friable, stratified silt loam and fine sandy loam, spotted with light gray and reddish brown; contains some angular chert fragments.

In most places there is some chert on the surface and throughout the profile, but there is not enough to interfere with tillage. In the lower layers the content of chert varies. In a few places beds of chert occur at depths of 12 to 18 inches, and in these places the water-holding capacity is only fair. Waterworn gravel occurs in some areas. In a few places along Shoal and Factory Creeks, the surface layer and subsoil have a texture of coarse silty clay loam and are darker than in the typical soil. In places, at depths below 24 inches, the material is stratified fine sandy loam, loamy sand, gravel, or chert several feet thick.

Ennis silt loam is medium acid. The content of plant nutrients and organic matter is moderate. Surface runoff is slow, and internal drainage is medium to rapid. Permeability is rapid, and the water-supplying capacity is high.

Use and suitability (management group 1).—Most of this soil is used for crops or pasture. The main crops are corn, soybeans, and lespedeza. The streams are generally bordered by trees that shade the adjoining soil. The trees are chiefly beech, elm, gum, hickory, maple, oak, and sycamore.

This soil is easy to work, and crops grown on it produce high yields. It is somewhat limited in use, however, because of flooding. Although floodwaters generally add sediments high in plant nutrients and organic matter, in places they cause scouring and deposit gravelly or cherty materials. The length of time water covers different areas of this soil varies, and thus the suitability of the soil for winter or perennial crops varies. The soil is best suited to summer annuals. It can be used intensively for corn, particularly in rotations that include winter-cover and green-manure crops. This soil is suited to irrigation.

Ennis cherty silt loam (0 to 5 percent slopes) (Eb).—Except that this soil contains more chert, it is similar to Ennis silt loam. Much of it occupies long, narrow areas along minor streams, but some of it occurs along streams in all parts of the county. It is associated with Ennis silt loam and with Baxter, Bodine, Greendale, Humphreys, and Lobelville soils.

The surface layer is grayish-brown to dark-brown friable cherty silt loam. The subsoil is yellowish-brown to brown friable cherty silt loam.

This soil is medium acid. In most places the water-holding capacity is moderate. In places beds of gravel and chert occur at depths of 12 to 18 inches; in these places

the soil has a low water-holding capacity and is low in productivity.

Use and suitability (management group 1).—About half of this soil is used for pasture or for general field crops. Corn is the principal crop, but much of the soil is pastured. Soybeans, lespedeza, and sorghum are grown to a lesser extent than corn.

This soil is well suited to corn, soybeans, lespedeza, and sorghum. Because of periodic flooding, it is risky to grow small grains, winter legumes, and perennial crops such as alfalfa and red clover. These crops can be grown on some farms, however, as flooding varies, and in places the soil is not flooded for long periods. This soil is easy to work, but the chert hinders tillage. A complete fertilizer is needed to maintain satisfactory yields.

In places scouring occurs, and in others chert and gravel are deposited. The soil in these places needs special management.

Etowah silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Ed).—This well-drained soil occurs on stream terraces along drainageways throughout the county. Most of it is in the Ennis-Humphreys-Etowah-Captina soil association. It has formed under a hardwood forest that consisted mainly of various kinds of trees, chiefly gum, hickory, oak, poplar, and walnut. The parent material was old mixed alluvium washed from soils formed mostly from cherty limestone that, in places, was covered by a thin layer of loess.

Much of the surface soil has been lost through erosion, and many small spots are so severely eroded that the subsoil is exposed. Tillage has mixed some of the subsoil with the surface layer. Except that this soil is redder, better drained, and has no fragipan, it is similar to the Captina and Taft soils. It is redder, firmer, and more clayey than the Humphreys soils.

Profile description:

- 0 to 6 inches, grayish-brown to dark-brown, very friable silt loam; contains some fine chert or pebbles; very weak very fine crumb structure.
- 6 to 17 inches, strong-brown to reddish-brown, friable to firm silty clay loam; moderate medium blocky structure.
- 17 to 27 inches, red to dark-red, firm to compact silty clay loam; contains some chert fragments and pebbles up to three-fourths inch in diameter; strong medium blocky structure.
- 27 to 48 inches +, dark-red, compact silty clay; contains much angular chert up to 2 inches in diameter and some pebbles; strong to very strong medium subangular blocky structure.

Generally chert fragments occur in varying amounts throughout the profile. The surface layer is 4 to 10 inches thick. In a few places the subsoil is firm, red cherty silty clay loam at a depth of about 18 inches. In a few places the soil has formed almost entirely from silty material. The soil in these places has a profile that is not so well developed as that of the typical soil.

This soil is medium acid to strongly acid. The content of organic matter and plant nutrients is moderate. Surface runoff and internal drainage are medium, and the water-holding capacity is high. This soil is permeable throughout, and the subsoil is well aerated.

Included with this soil are a few uneroded areas. Also included are a few areas in which the subsoil is a friable yellowish-brown silty clay loam.

Use and suitability (management group 3).—Nearly all of Etowah silt loam, eroded gently sloping phase, is used for crops and pasture. Only a small part is idle.



Figure 3.—Burley tobacco on Etowah silt loam, eroded gently sloping phase. Soils on hills in the background are steep phases of Bodine cherty silt loam.

This soil is well suited to pasture and to all the crops commonly grown in the county. Where air drainage is adequate, it is suited to orchards. Tobacco (fig. 3), red clover, and alfalfa will grow well. This soil is easy to work, and crops grown on it generally produce high yields. Rotations in which row crops are grown only 1 year out of every 2 to 4 are needed to prevent erosion. Lime and a complete fertilizer are required to maintain high yields. This soil responds well to management and is suitable for irrigation.

Etowah silt loam, eroded sloping phase (5 to 12 percent slopes) (Ee).—Except that this soil is on stronger slopes and contains more chert and gravel, it is similar to Etowah silt loam, eroded gently sloping phase. It occurs in the same general areas and is associated with the same soils. From 25 to 75 percent of the surface soil has been lost by erosion. Some small spots are so severely eroded that the red, firm silty clay is exposed. There are some short, shallow gullies. In some places tillage has mixed some of the subsoil with the surface soil, and here the present surface soil varies in color and texture. The surface layer is grayish-brown to reddish-brown friable silt loam.

This soil is medium acid to strongly acid and has a moderate content of organic matter. Surface runoff is rapid and internal drainage is medium. The water-supplying capacity is high. This soil is permeable. It has a moderate erosion hazard.

Use and suitability (management group 4).—Nearly all of this soil is used for crops or pasture. A small acreage is in cutover forest consisting mainly of various kinds of hickories, oaks, and poplars. A number of different crops are grown.

This soil is well suited to all the field crops grown in the county. It is easy to work, and moderate yields are made under ordinary management. Under good management high crop yields can be made and pastures can be established and maintained. A suitable rotation is one in which row crops are grown only 1 year to 5 years of close-growing crops. To prevent erosion and conserve moisture, contour tillage is needed. In some places terracing is required. In many places the diversion of the runoff from the slopes above will be needed.

Etowah silty clay loam, severely eroded sloping phase (5 to 12 percent slopes) (Ef).—Except that this soil has a

thinner surface soil and occupies steeper slopes, it is similar to Etowah silt loam, eroded gently sloping phase. It occurs in the same general areas and is associated with the same soils. Erosion has removed nearly all of the surface soil and, in places, part of the subsoil. Short, shallow gullies are common. There is some chert gravel on the surface and in the subsoil.

The surface soil consists mainly of subsoil that has been mixed with the surface soil by tillage. The present surface soil ranges from brown to red in color and from silty clay loam to silt loam in texture.

This soil is medium acid to strongly acid. Its content of organic matter is moderate to low. Surface runoff is rapid and internal drainage is medium. The water-holding capacity is low. This soil is permeable. It has a high erosion hazard.

Use and suitability (management group 4).—All of this soil has been cultivated. An estimated 20 percent is now idle, and a small acreage is pastured. The rest is used mostly for cotton, corn, lespedeza, small grains, and vetch.

This soil is suited to small grains, hay, sericea lespedeza, red clover, alfalfa, and pasture. It is seriously eroded and needs good management to restore it to productivity. The soil is fairly easy to work. If it is cultivated, contour tillage and terracing are required. A suitable rotation is one in which the soil is used for legumes and grasses 4 to 5 years for every 1 year of row crops. This soil responds well to applications of lime and fertilizer.

Greendale cherty silt loam (0 to 5 percent slopes) (Ga).—This moderately well drained to well drained soil has formed on alluvial fans under a hardwood forest. The trees were mainly beech, maple, yellow-poplar, walnut, hickory, and oak. This is a young, cherty soil, sometimes called "made land." It consists of local alluvium or sloopwash derived mainly from the Baxter and Bodine soils of the uplands. The parent material has washed chiefly from soils that formed from limestone residuum, and, in places, these soils had a thin capping of loess.

This soil occurs throughout the county where small streams emerge onto the flood plains of larger streams; on narrow bottoms along deeply entrenched stream beds; and on narrow sloping areas at the bases of steep slopes. A few areas have slopes of as much as 8 percent. Most of this soil is in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association. It is associated with the Baxter, Bodine, Ennis, Humphreys, and Lobelville soils.

Except that this soil is younger, has less contrast between the surface and subsoil layers, and has a subsoil that is less firm and less clayey, it is similar to Humphreys cherty silt loam of the second bottoms. In general it is better developed than the Ennis and Lobelville soils of first bottoms. All of these soils have formed from similar parent materials.

Profile description:

- 0 to 7 inches, light grayish-brown to brown, friable cherty silt loam.
- 7 to 15 inches, yellowish-brown to brown, friable, cherty, heavy silt loam; chert fragments are mainly less than 2 inches in diameter.
- 15 to 40 inches, yellowish-brown to brown, friable to firm, cherty silty clay loam; has some gray mottles and seams in lower part; weak to moderate medium blocky structure.
- 40 inches+, chert bed.

In places there are chert and quartz pebbles throughout the profile. The chert fragments are up to 5 inches in diameter and increase in number with depth. In many places this soil is mottled at depths below 20 inches. In a few places in the southeastern part of the county, the surface layer is red sandy or clayey soil that has washed from the iron pits. In a few places there are chert beds within 18 inches of the surface.

This soil is medium acid to strongly acid. The content of plant nutrients and organic matter is medium to low. Surface runoff is medium, and internal drainage is medium to rapid. The water-supplying capacity is high. This soil is very porous and is permeable.

Included with this soil are a few small, imperfectly drained areas and a few small areas that are too cherty to cultivate.

Use and suitability (management group 2).—About half of Greendale cherty silt loam has been cleared, and most of the cleared areas are used for crops. The areas not used for crops are in unimproved pasture or idle. Many farm homes, barnyards, and gardens are on this soil.

Although this soil is cherty, it is well suited to pasture and to early vegetables and similar crops. It generally occupies narrow areas of irregular shape and is generally farmed the same as adjoining soils. Much of it occupies long, narrow strips shaded by trees on steep, wooded upland soils that are poorly suited to agriculture. On many farms such areas are best used for forest. The areas that have chert beds fairly near the surface are droughty and are not suited to field crops, particularly corn.

Under good management the usual moderate yields can be increased and loss of soil by erosion can be kept to a minimum. The use of crop rotations, lime, and a complete fertilizer are needed for best yields.

Greendale silt loam (0 to 5 percent slopes) (Gb).—This well-drained soil has formed from silty materials washed mainly from Baxter, Bodine, Dickson, and Mountview soils. It is a young soil and does not have distinct surface and subsoil layers. This soil occurs throughout the county at the bases of slopes from which the parent material washed. Most of it occupies long, narrow, irregularly shaped areas along intermittent drainageways. It is in the Mountview-Dickson-Lobelville and the Bodine-Mountview (shallow)-Greendale-Lobelville soil associations. Except that this soil is better drained and contains less chert, it is similar to Greendale cherty silt loam. It is lighter colored and has formed from chertier material than Emory silt loam. It is better drained than Lobelville silt loam, local alluvium phase. All are young soils of the bottom lands.

Profile description:

- 0 to 8 inches, grayish-brown to dark-brown, very friable silt loam; contains some angular chert fragments up to 2 inches in diameter.
- 8 to 36 inches, yellowish-brown to dark-brown, friable, fine silt loam to coarse silty clay loam; a few faint gray mottles in lower part; contains some chert fragments up to 2 inches in diameter.
- 36 to 48 inches, yellowish-brown, friable, cherty, coarse silty clay loam with faint, fine, light-gray mottles; compact in place; contains some quartz and chert pebbles up to 1 inch in diameter; grades to gray, compact chert beds.

Both the depth of this soil and the source of the parent material vary. In some places there is more chert than

in the typical profile but not enough to hinder tillage. In places the depth to underlying material is between 18 and 36 inches, and in many places this soil overlies an older soil such as the Mountview. In some places the 8- to 36-inch layer is dark-brown very friable silt loam. In a few places this soil is mottled at depths between 8 and 30 inches.

This soil is medium acid to strongly acid. Its content of plant nutrients is medium to low. Surface runoff and internal drainage are medium, and the water-supplying capacity is high. Permeability is rapid.

Use and suitability (management group 2).—Nearly all of this soil is used for crops (fig. 4). Ordinarily, it is used

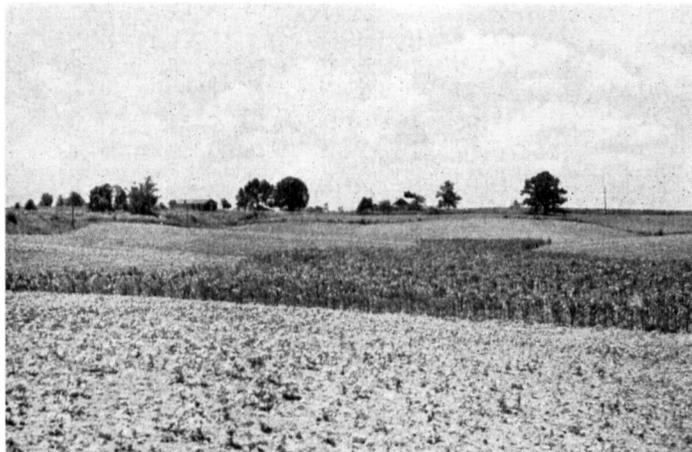


Figure 4.—Corn on Greendale silt loam along the drainageways. The soil on the slopes is Mountview silt loam, eroded sloping shallow phase.

the same as the soils on adjacent slopes.

This soil is easy to work and, if well managed, can be cropped intensively. It is well suited to corn, tobacco, truck crops, and pasture. Yields are moderate. Removal of excess surface water and control of runoff from adjacent slopes is necessary to grow small grains, alfalfa, strawberries, and orchardgrass, and to keep the soil from eroding. Lime and a complete fertilizer are needed for best yields.

Guthrie silt loam (0 to 3 percent slopes) (Gc).—This is a poorly drained soil of the uplands. Most of it is on level or depressed areas, but some of it is on slopes that range up to 3 percent. It occupies large to small areas, chiefly in the Dickson-Lawrence-Guthrie and Sango-Lawrence-Guthrie soil associations. This soil is grayer and more poorly drained than the Dickson, Lawrence, and Sango soils that formed from similar parent material, and its pan layer is more clayey. The parent material in most places is weathered cherty limestone capped by a thin layer of loess. A few areas have formed over high-grade, chert-free limestone. The original forest was made up of water-tolerant trees, as gum, red maple, and willow oak.

Profile description (uncleared area):

- 0 to 3 inches, light-gray or gray very friable silt loam or silt that is stained with organic matter; structureless or very weak, very fine crumb structure.
- 3 to 18 inches, light-gray friable silt loam; many pale-yellow and rust-colored, faint, fine mottles; white when dry, and may have an ashy feel; structureless.
- 18 to 42 inches (pan), dark-gray, compact, massive silty clay to clay; has pale-yellow and rust-colored mottles that

increase in size and number in lower part; strong medium to coarse blocky structure.

42 inches to 52 inches+, very compact gray silt loam mottled with pale yellow and rust color; contains some chert fragments and quartz pebbles; generally has strong medium to coarse blocky structure but is platy in places; grades to cherty limestone residuum at depths of 5 feet or more.

In some places there is a brown deposit, less than 6 inches thick, that has washed from higher areas. The pan layer varies. In places the pan is at depths of 8 to 24 inches, and in some places it is only 12 to 14 inches thick. In some places it is a silty clay loam that is firm but not compact. In places most of these variations in the pan layer occur in a single area.

This soil is very strongly acid to extremely acid. The content of organic matter is low. In the cleared areas the supply of organic matter is very low. Surface runoff is very slow or ponded, and internal drainage is very slow. The water-supplying capacity is low. The subsoil is poorly aerated, and the pan is very slowly permeable. In wet seasons water stands on the surface much of the time, and in dry seasons the soil becomes rather hard.

Use and suitability (management group 9).—This soil is mainly in forest, but some is in pasture. A small acreage is used for crops, mainly corn and soybeans. Some rye and vetch are grown.

This soil is poorly suited to crops and is only fairly well suited to pasture. It is suited to tall fescue, whiteclover, common lespedeza, and redbud. Yields of crops and pastures are low. On many farms this soil is best kept in forest. In some areas artificial drainage would improve the soil for pasture, but outlets are normally not available. Furthermore, the compact, impervious pan limits root penetration and the moisture-supplying capacity. Lime and a complete fertilizer are needed for all crops and pasture. The response is limited, however, by the droughtiness of the soil, and yields are uncertain.

Guthrie silt loam, overwash phase (0 to 3 percent slopes) (Gd).—This poorly drained soil is on uplands. It has formed under a hardwood forest consisting mainly of beech, hickory, gum, red maple, water-tolerant oaks, and willow. This soil occurs throughout the county in bands at the bases of slopes that border areas occupied by Guthrie silt loam, in narrow areas along intermittent streams, and in shallow depressions. Most of it is in the Mountview-Dickson-Lobelville and Dickson-Lawrence-Guthrie soil associations. It is made up of materials recently washed from soils on adjoining upland slopes. The materials came chiefly from loess that overlies Guthrie silt loam. In contrast to Lee silt loam, this soil occupies areas above flood stage, is formed from silty local alluvium, and has a pan in the lower subsoil.

Profile description:

- 0 to 10 inches, light yellowish-brown to brown very friable silt loam; many light-gray and rust-colored faint, fine mottles.
- 10 to 22 inches, light-gray very friable silt or silt loam; distinct pale-yellow and rust-colored mottles.
- 22 to 38 inches+, light-gray silt or silt loam mottled with pale yellow and rust color; compact in place; grades to heavier, more compact material at depths of 4 feet or more.

In places the surface layer is 18 inches thick and is mottled with dark brown. In some places in the narrow areas, the soil contains a layer 24 inches thick that consists of very recently deposited friable silt loam, mottled with gray and brown. In most places in the broader areas, the layer of recent overwash is at least 8 inches thick. In

many places the subsoil in these areas consists of firm silty clay loam at depths between 13 and 15 inches and of silty clay at depths below 18 to 20 inches. In many places on these broader areas, the soil is less permeable than the typical soil. In a few places cherty layers occur at depths of 18 to 30 inches.

This soil is strongly acid to very strongly acid. Surface runoff is very slow to ponded, internal drainage is very slow, and the water-holding capacity is low. In some places there is a high water table.

Use and suitability (management group 9).—About 65 percent of this soil is cleared. Of this, most is used for corn, common lespedeza, soybeans, hay, tall fescue, and pasture. About 10 to 15 percent is idle. Some areas are used along with the better drained adjacent soils.

Although this soil has no erosion hazard and is fairly easy to work, its use is limited by poor drainage. Yields are low. The soil is best suited to annual crops such as soybeans, common lespedeza, and sorghum. If drainage is improved, the soil is suited to corn and is well suited to tall fescue, Ladino clover, white clover, and redtop. It is poorly suited to small grains and alfalfa. Lime and fertilizer are needed to maintain moderate yields of all crops.

Humphreys silt loam (0 to .5 percent slopes) (Hb).—This well-drained soil occurs on low stream terraces. It has formed under a hardwood forest made up chiefly of beech, hickory, maple, red and white oaks, walnut, and yellow-poplar. The parent material is old general alluvium washed from soils that have formed chiefly from cherty limestone and silt. This soil is chiefly in the Ennis-Humphreys-Etowah-Captina soil association. It is associated with Bodine, Ennis, Etowah, Greendale, and Taft soils. This soil is on lower terraces, is less well developed, and has a browner, less firm silty clay loam subsoil than the Etowah soils. In contrast to the Ennis soils, which are formed from similar material, the Humphreys soils have better developed profiles and occupy slightly higher elevations.

Profile description:

- 0 to 12 inches, grayish-brown to dark-brown very friable silt loam.
- 12 to 24 inches, yellowish-brown to dark-brown, friable, light silty clay loam; a few strong-brown mottles; contains a few angular chert fragments; weak to moderate medium blocky structure.
- 24 to 36 inches+, yellowish-brown, friable, light silty clay loam, mottled with strong brown and a little gray; becomes cherty and more mottled with depth; moderate medium blocky structure.

The surface layer ranges from 6 to 14 inches in thickness. In some places part of the surface soil has been lost by erosion. Chert occurs in the plow layer in places, but there is not enough to hinder tillage. The content of chert in the subsoil varies, and in some places there is much chert. In a few places the subsoil is a dark-brown, friable silt loam. Along Shoal Creek, in a few places, the subsoil is a dark yellowish-brown, compact silty clay loam, and the soil in these places is somewhat less productive. In some places the soil is slightly mottled at depths below 30 inches.

This soil is medium acid to strongly acid. Its content of organic matter is moderate. Runoff is medium to low, internal drainage is medium, and the water-holding

capacity is high. The 10- to 24-inch layer is porous, and the soil is rapidly permeable. The erosion hazard is slight to moderate.

Included with this soil are a few areas of Humphreys cherty silt loam that are too small to be mapped separately. These are indicated on the soil map by chert symbols.

Use and suitability (management group 2).—Nearly all of Humphreys silt loam is used for crops and pasture. Only a small part is idle.

This is one of the better agricultural soils in the county. It is easy to work, responds well to management, and makes good yields. It is well suited to pasture and to most of the crops commonly grown in the county. Cotton, corn, tobacco, soybeans, small grains, common lespedeza, red clover, and alfalfa grow well. Lime and a complete fertilizer are needed to maintain high yields of all crops and pasture. The soil is well suited to irrigation. At times some areas are flooded.

Humphreys cherty silt loam (0 to 5 percent slopes) (Ha).—Except that this soil contains more chert and therefore is lower in water-supplying capacity, it is similar to Humphreys silt loam. It is a well-drained soil that occurs on low stream terraces. It is associated with Ennis, Etowah, Greendale, and Lobelville soils, and with Humphreys silt loam.

The surface soil is grayish-brown to dark-brown very friable cherty silt loam. The subsoil is light yellowish-brown to brown friable cherty silt loam or cherty silty clay loam. The chert fragments are as much as 6 inches in diameter and, in places, make up as much as 50 percent of the soil.

This soil is strongly acid to medium acid. Surface runoff is low, internal drainage is medium to rapid, and the water-holding capacity is moderate. The soil is very permeable.

Use and suitability (management group 2).—Most of this soil is used for crops. Some is used for pasture, and only a small acreage is idle.

This soil is suited to nearly all of the crops commonly grown in the county. It is easy to work, but the chert hinders tillage. Yields are low, but they can be increased under good management. Lime and a complete fertilizer are necessary to grow alfalfa and red clover and are needed to obtain high yields of all other crops.

Lawrence silt loam (0 to 4 percent slopes) (La).—This somewhat poorly drained soil is on uplands. It has formed under a forest made up mainly of gum, red maple, willow, and blackjack and post oak trees. Most of the soil has slopes of 2 to 3 percent, but about 25 percent is on slopes of less than 2 percent. Some is in depressions.

This soil is mostly in the Dickson-Lawrence-Guthrie and Sango-Lawrence-Guthrie soil associations. Most of it occupies narrow bands between areas of Dickson and Guthrie soils. Some of it is in the same general area as the Sango soils, and some isolated areas are near Mountview soils. The parent material is loess that overlies material weathered from cherty limestone.

This soil is better drained and occupies higher positions than the Guthrie soils. It is not so well drained as the Dickson and Sango soils and has milder slopes. The Guthrie, Dickson, and Sango soils also occur on uplands and have formed from silt that contains little chert. They also have fragipans.

Profile description of uneroded forested area on 0 to 2 percent slopes:

- A thin layer of leaves and forest litter is on the surface.
- 0 to 10 inches, gray to pale-yellow friable silt loam, the upper 2 inches stained with organic matter; contains a few chert fragments up to 2 inches in diameter.
- 10 to 16 inches, pale-yellow, friable to firm, light silty clay loam, finely mottled with light gray and rust brown; hard when dry; contains a few chert fragments; moderate medium blocky structure.
- 16 to 24 inches (fragipan), pale-yellow to light-gray firm silty clay loam, mottled with gray, rust color and light brown; hard to very hard when dry; moderate medium blocky structure.
- 24 to 36 inches+, mottled gray, yellow, and rust-colored compact silty clay loam that grades to compact clay containing some chert fragments; gradual transition to cherty limestone residuum at depths of 4 to 10 feet; massive; breaks to moderate medium to coarse blocky fragments.

The thickness of the 10- to 16-inch layer ranges from 4 to 8 inches. In some places the subsoil, at depths of about 12 inches, is compact silty clay loam. The depth to the fragipan ranges from 16 to 30 inches. Some angular chert fragments occur in the fragipan in places.

In most of the cleared areas, the thin layer of forest litter and leaves is gone and part of the surface layer has been lost by erosion or by tillage. Tillage in most of the cleared areas is still in the original surface soil, but there has been some mixing of the subsoil with the surface soil. In some places the subsoil is exposed. The soil in the cleared areas ranges from friable silt loam to coarse silty clay loam in texture, and there are some small patches of firm to compact silty clay loam. In some places small rills occur following heavy rains.

This soil is very strongly acid to extremely acid. Its content of organic matter is low. Surface runoff is very slow, and in places the water is ponded. Internal drainage is very slow, and the water-holding capacity is low. The fragipan retards downward movement of water. During spring and fall the soil is wet much of the time. The soil is poorly aerated, and the fragipan is almost impervious to roots.

Use and suitability (management group 8).—About 30 percent of this soil is in cutover forest, some of which has been burned over. About 10 percent is used for crops, about 40 percent is pastured, and about 20 percent is idle. The chief crops are corn, soybeans, cotton, common lespedeza, and rye and vetch. Because in many places this soil occurs in small areas of irregular shape, on some farms it is used for cultivated crops along with Dickson and Sango soils and for pasture where it occurs with Guthrie soils.

Although this soil is easy to work, it is too wet for tillage or for roots to grow much of the year, and in dry seasons it is droughty. It is poorly suited to cultivated crops and is better suited to pasture. Some areas are best used for trees. Hay and pasture plants, as tall fescue, redbud, whiteclover, and common lespedeza, make fair yields.

The soil is suited to soybeans, sericea lespedeza, sorghum, and rye and vetch but is poorly suited to corn, wheat, oats, barley, and alfalfa. In most places it needs surface drainage, and in some places it needs diversion ditches to carry away runoff from the slopes above. Artificial drainage would widen the use of this soil, but the compact pan and lack of suitable outlets hinder drainage in many

places. Lime and a complete fertilizer are required to maintain even fair yields of all crops and pasture.

Lawrence silt loam, brown variant (0 to 5 percent slopes) (Lb).—This somewhat poorly drained soil has formed under a hardwood forest that consisted mainly of various kinds of gum, hickory, and oak trees. It lies between the well-drained Pembroke and Decatur soils and the poorly drained Guthrie soils. It is associated with Decatur, Guthrie, and Pembroke soils and with the dark brown surface phases of the Dickson series. Most of it is in the Pembroke-Decatur-Emory soil association. The parent material was washed mainly from the red associated soils.

Profile description:

- 0 to 6 inches, dark yellowish-brown to dark-brown very friable silt loam; contains many small, dark, fairly hard concretions; very fine weak crumb structure.
- 6 to 17 inches, yellowish-brown to strong-brown friable silt loam; has a few faint mottles of light gray and rust color; contains several large and small, dark, soft concretions.
- 17 to 26 inches (pan), mottled light-gray, weak-red, strong-brown, and rust-colored, firm, heavy silt loam; this is a weakly cemented concretionary pan that contains many soft to hard black concretions, $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter, and colored rust, yellow, and brown on the inside.
- 26 to 60 inches+, mottled red and black compact silty clay containing pockets, about half of which are filled with firm, white silt loam to silty clay loam mottled with pale yellow; the pockets are irregular in shape and length; many are about 3 inches across and 6 to 12 inches long, although the walls are curved; this layer resembles a red sponge, the openings of which are filled with light-colored material.

The surface layer ranges from 4 to 10 inches in thickness. In a few places the soil is slightly eroded and has a thin surface layer. In some places the soil is more poorly drained than the typical soil. In some places the colluvial deposit is very recent and the profile is less well developed than in the normal soil. There are a few spots that have a subsoil of firm silty clay loam.

This soil is medium acid to strongly acid. Its content of plant nutrients and organic matter is moderate. Surface runoff is slow, and internal drainage is slow to very slow. In some places the water is ponded. The water-supplying capacity is moderate to high. The topmost 18 inches is permeable, but the lower layers are much less permeable.

Included with this soil are a few small areas that are similar to the dark brown surface phases of Dickson silt loam.

Use and suitability (management group 8).—Most of Lawrence silt loam, brown variant, is used for crops, chiefly soybeans, cotton, common lespedeza, and some corn. Only a small part is pastured.

This soil is poorly suited to corn, cotton, small grains, winter legumes, alfalfa, and red clover. It is well suited to sorghum, soybeans, and common lespedeza. Tall fescue and whiteclover can be grown but need lime and a complete fertilizer. The soil is easy to work. If it is drained it is suited to corn, cotton, small grains, and pasture. Generally, drainage is hindered, however, by lack of outlets.

Lee silt loam (0 to 2 percent slopes) (Lc).—This is a poorly drained soil of the bottom lands. It has formed under a forest made up mainly of water-tolerant trees, as blackgum, sweetgum, red maple, and willow oak. The parent material is alluvium that has washed chiefly from upland soils, which are underlain by cherty limestone that

has a thin capping of loess in places. Most of the soil occupies long narrow strips along creeks, but some is in wider areas that receive sediments from intermittent drainageways.

This soil is mostly in the Ennis-Humphreys-Etowah-Captina and the Bodine-Mountview (shallow)-Greendale-Lobelville soil associations. It is associated mainly with Bodine, Ennis, Greendale, Lobelville, and Pace soils. It is more poorly drained than the Ennis, Greendale, and Lobelville soils, which are also young soils that have formed from similar materials. It is younger than the better drained Pace soils and the poorly drained Robertsville soil that have formed on stream terraces, and it is less cherty and darker colored than the Bodine soils.

Profile description:

- 0 to 4 inches, light-gray to dark-gray very friable silt loam or loam stained by organic matter; contains some fine chert.
- 4 to 24 inches, white to light-gray friable silt loam mottled with pale yellow and rust color; contains some chert fragments one-half inch in diameter; somewhat compact in place.
- 24 to 36 inches, mottled pale-yellow, gray, rust-colored, and white compact silt loam; contains some fine chert.

The surface layer ranges from 2 to 8 inches in thickness. In some places the soil material below 24 inches is several feet thick. In the southeastern part of the county are a few areas in which there is a 6-inch deposit of red silty clay loam that has washed from iron pits. The content of chert varies, but the fragments are small in most places. A few small areas are cherty enough to hinder tillage. There are crawfish chimneys in many places. In some places a very cherty layer occurs at depths below 18 inches, and in some places the subsoil is firm silty clay loam at depths below 24 to 28 inches. In many places water seeps from the adjacent steep slopes occupied by Bodine soils, and many small areas are saturated by water from seepage and from springs.

This soil is strongly acid to very strongly acid, and its content of organic matter is low. Surface runoff is very slow to ponded, and the water-holding capacity is high. Internal drainage is very slow and the water table is high. The lower part of the profile is poorly aerated and is saturated much of the time.

Use and suitability (management group 9).—Most of this soil is in forest, and much of the cleared part is idle. The rest is mainly in pasture, but some is used for corn, sorghum, and soybeans.

This soil is poorly suited to most crops requiring tillage. Much of it is fairly well suited to redtop, ryegrass, white-clover, common lespedeza, sorghum, and soybeans. The soil is well suited to tall fescue and white and Ladino clovers if it is drained, but lime and a complete fertilizer will be needed. Many areas need drainage. If the soil in these areas is drained, corn, sorghum, soybeans, hay, and pasture make moderate yields. In many places, however, drainage may not be practical, because suitable outlets are lacking.

Lobelville silt loam (0 to 3 percent slopes) (Le).—This somewhat poorly drained to moderately well drained soil has formed on first bottoms under forest. The trees were mainly various kinds of gum and willow, and hickory, sycamore, water oak, and willow oak. The parent material is alluvium washed from upland soils underlain chiefly by cherty limestone that is capped with loess in places.

Much of this soil is on flood plains in narrow areas along streams. It is associated with Bodine and Ennis soils

and with Lee silt loam and Lobelville cherty silt loam. Most of it is in the Ennis-Humphreys-Etowah-Captina and the Bodine-Mountview (shallow)-Greendale-Lobelville soil associations. It is not so cherty and is browner than the Bodine soils. Its parent material is similar to that of the well-drained Ennis soils and the poorly drained Lee soil.

Profile description:

- 0 to 7 inches, brown to brownish-gray very friable silt loam faintly mottled with gray; contains a few angular chert fragments.
- 7 to 22 inches, mottled gray, brown, and yellow friable silt loam, the gray color increasing with depth; contains some chert.
- 22 to 36 inches, gray friable silt loam mottled with rust and brown.
- 36 to 44 inches +, dark-gray firm silty clay loam with many rust-colored streaks; contains much angular chert; somewhat massive.

The surface layer ranges from 6 to 18 inches in thickness. In a few places it has a dark-brown, firm silty clay loam surface soil and a gray, firm silty clay loam subsoil. In a few places the subsoil between depths of 18 and 24 inches is a coarse silty clay loam that is less permeable than the subsoil in the typical profile. In many places chert fragments are scattered on the surface, but they do not hinder tillage. The lower layers vary in content of chert but generally are cherty.

This soil is medium acid to strongly acid, and its content of organic matter is low. Surface runoff is very slow, and internal drainage is slow. The water-supplying capacity is high. Although this soil is permeable throughout, the lower layers are poorly aerated in places and are saturated with water much of the time.

Use and suitability (management group 1).—Nearly all of this soil is used for crops and pasture. Only a small part is idle.

This soil is well suited to summer pasture. It is almost as well suited to corn, sorghum, soybeans, and common lespedeza and to other hay and pasture plants. The crops make moderate yields. This soil is easy to work. It responds well to fertilizer. Its use is limited, however, by periodic flooding. The soil is permeable enough for drainage, and on some farms it can be irrigated.

Lobelville cherty silt loam (0 to 3 percent slopes) (Ld).—Except that this soil contains more chert, it is similar to Lobelville silt loam. Most of it occurs in long, narrow areas along small creeks in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association. It is associated with Bodine, Ennis, Greendale, Humphreys, and Lee soils.

The surface layer is brownish-gray to brown very friable cherty silt loam. The subsoil is brownish-gray to yellowish-brown friable cherty silt loam, spotted with gray or strong brown.

This soil is strongly acid to very strongly acid. Surface runoff is slow to very slow, and internal drainage is slow. The water-holding capacity is moderate.

Use and suitability (management group 1).—About 60 percent of this soil is used for crops and pasture. Much of it is in unimproved pasture or idle, and the rest is used for crops. The main crops are corn, sorghum, and soybeans. Some common lespedeza is grown.

This soil is best suited to corn, soybeans, sorghum, common lespedeza, redtop, tall fescue, and whiteclover. It can be used about the same as Lobelville silt loam, but

it is cherty and harder to work, has a lower water-holding capacity, and is more deficient in plant nutrients. It is also less responsive to management.

Lobelville silt loam, local alluvium phase (0 to 5 percent slopes) (Lf).—This somewhat poorly drained to moderately well drained soil has formed under a hardwood forest. The trees were mainly gum, hickory, and oak, but there were many other kinds. This soil is on gentle slopes along intermittent drainageways, at the bases of upland slopes, and in shallow upland depressions. It occurs in most parts of the county, but it is mainly in the Mountview-Dickson-Lobelville and the Dickson-Lawrence-Guthrie soil associations. The parent material washed mainly from silty soils, as the Mountview and Dickson.

Profile description:

- 0 to 7 inches, grayish-brown to brown very friable silt loam faintly mottled with light gray.
- 7 to 20 inches, mottled strong-brown, pale-brown, light-gray and rust-colored very friable silt loam; mottles are large.
- 20 to 40 inches, mottled yellowish-brown, pale-yellow, and light-gray friable light silty clay loam; very weak medium blocky structure.

There is a small amount of chert in the surface layer and subsoil in many places. In many places the slope-wash is 12 to 24 inches thick and overlies an older soil, as the Lawrence or Dickson. In these places the soil has a yellowish, firm to friable silty clay loam subsoil at depths between 15 and 30 inches. In a few places the local alluvium has washed from Pembroke or Bewleyville soils and overlies Sango or Lawrence soils. Here, the surface layer is dark-brown very friable silt loam, 10 to 20 inches thick, and there is an abrupt transition to the subsoil of yellow, firm, light silty clay loam.

This soil is medium acid to strongly acid. The content of organic matter and plant nutrients varies but is generally moderate. Surface runoff is slow to very slow, and in a few places the water is ponded. The upper layers are permeable. The subsoil is very slowly permeable, and in many places it is only slightly permeable. Plant roots are confined mainly to the upper 18 to 20 inches.

Use and suitability (management group 2).—About 90 percent of this soil is cleared. Most of it is cropped, some is pastured, and a small part is idle.

This soil is suited to corn, cotton, common lespedeza, tobacco, sorghum, rye, vetch, red clover, white clover, redbud, and tall fescue. It is not suited to alfalfa and strawberries. As much of the soil occupies small, irregular areas, it is best used along with adjoining soils. The soil is easy to work, but its use is somewhat limited by poor drainage. In many places terraces, roads, or other barriers cause water to pond, and in some places runoff from the slopes above needs to be diverted. If this soil were drained, the yields of small grains and pasture crops would improve. Lime and a complete fertilizer are needed to maintain high yields of all crops and particularly the yields of tall fescue and white clover.

Mines, pits, and dumps (Ma).—This miscellaneous land type is made up mainly of excavations from which different types of materials have been removed. Most of the excavations are old pits where iron ore has been removed, and some are several acres in size. Their depth is as much as 30 feet or more. Some have several feet of water standing in them most of the time. There are a few old chert pits, and a few dumps made up of waste material taken from the mines and pits.

Use and suitability (management group 11).—None of this land type has any practical use for agriculture. Some of the areas are best used for trees, and some are reverting to forest. On some areas, however, reforestation is not feasible because of the ponded water.

Minvale cherty silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Mb).—This well-drained soil has formed on foot slopes under forest. The trees were mainly beech, gum, hickory, maple, walnut, and yellow-poplar. This soil is associated with the Baxter and Bodine soils of the uplands, with the Etowah and Humphreys soils of the terraces, and with the Ennis and Greendale soils of the bottom lands. Most of it is in the Ennis-Humphreys-Etowah-Captina and the Bodine-Mountview (shallow)-Greendale-Lobelville soil associations. The parent material has washed mainly from the steeper Baxter and Bodine soils.

This soil has a browner surface layer than the Baxter soils. It is darker colored than the associated Bodine and Sulphura soils. It is older than the Greendale and Humphreys soils and more cherty than the Etowah soils.

In most areas this soil receives runoff from the slopes above. Most of it has lost part of the surface soil through erosion. The present surface layer in these areas is brown to red friable cherty silt loam, and in some small places the subsoil of red, firm, cherty silty clay loam is exposed.

Profile description:

- 0 to 6 inches, light-brown to reddish-brown friable cherty silt loam; chert fragments are up to 4 inches in diameter.
- 6 to 32 inches, dark-brown to dark-red firm cherty silty clay loam; many of the chert fragments are 3 inches in diameter; moderate to strong medium blocky structure.
- 32 to 60 inches +, mottled red, gray, and yellow compact cherty silty clay loam; color becomes paler with depth and content of chert increases; strong medium blocky structure.

The depth of the slope-wash ranges from about 36 inches to several feet. In places, at depths below 3 or 4 feet, it rests on shale, chert beds, or massive limestone. In some places pebbles up to 1 inch in diameter occur throughout, and in a few small areas the soil is almost too cherty for tillage. Rock outcrops occur in some places, and the weathered parent material is exposed in a few places.

This soil is strongly acid to very strongly acid, and its content of plant nutrients and organic matter is moderate to low. Surface runoff and internal drainage are medium, and the water-holding capacity is high. Permeability is rapid.

Included in this mapping unit are a few areas in which the soil is slightly phosphatic. These are in the southern part of the county.

Use and suitability (management group 4).—Most of Minvale cherty silt loam, eroded gently sloping phase, is used for crops and pasture. Only a small acreage is idle.

This soil is well suited to all of the crops commonly grown in the county, including tobacco and strawberries. It is easy to work, but the chert hinders tillage in places. Although areas of this soil are small, farm machinery generally can be used. A suitable rotation is one in which a row crop is grown every 2 to 4 years. Under good management high yields are made, but lime and a complete fertilizer are necessary to maintain these yields.

Minvale cherty silt loam, sloping phase (5 to 12 percent slopes) (Mc).—Except that this soil is on stronger slopes, is not eroded, has thinner layers, and is shallower and more variable in depth to bedrock, it is similar to Minvale

cherty silt loam, eroded gently sloping phase. It occurs in the same general areas as other Minvale soils. The surface is covered with leaves and forest litter, and in undisturbed areas the surface soil is stained dark with organic matter. In a few small areas, this soil is too cherty for tillage.

This soil is strongly acid to very strongly acid. The content of organic matter is low. Surface runoff is rapid, internal drainage is medium, and the water-holding capacity is high. The soil is permeable.

Use and suitability (management group 4).—Most of this soil is in cutover hardwood forest. Only a small amount is cultivated.

This soil is well suited to pasture and to most of the crops grown in the county, including tobacco, small grains, and strawberries. Areas that are inaccessible are best kept in trees. Although the soil is cherty, it is easy to work. A 3- to 5-year rotation is needed to keep soil losses at a minimum, and in some places contour stripcropping and terracing are desirable. Lime and a complete fertilizer are necessary to maintain moderate to high yields.

Minvale cherty silt loam, eroded sloping phase (5 to 12 percent slopes) (Md).—Except that this soil is on stronger slopes, is more cherty, has thinner layers, and is shallower over bedrock, it is similar to Minvale cherty silt loam, eroded gently sloping phase. It occurs in similar locations and is associated with the same soils. From 25 to 75 percent of the original surface soil has been lost by erosion. There has been much mixing of the subsoil with the surface soil, and there are many short, shallow gullies.

This soil is strongly acid to very strongly acid. The content of organic matter is low. Surface runoff is rapid and internal drainage is medium. The water-holding capacity is moderate.

Use and suitability (management group 4).—About 70 percent of this soil is used for crops, mainly cotton, corn, common lespedeza, small grains, vetch, and soybeans. About half of the remainder is in pastures that are mainly unimproved. The rest is idle.

This soil is well suited to pasture and to all of the crops commonly grown in the county. Although the chert hinders tillage and some places are too cherty for tillage, the soil is easy to work. Yields are low under ordinary management, but under good management moderate to good yields can be made. Contour tillage is needed, and in some places ditches are needed to divert runoff from the slopes above. A suitable rotation is one in which row crops are grown once every 3 years.

Minvale cherty silt loam, eroded moderately steep phase (12 to 25 percent slopes) (Me).—Except for having stronger slopes, thinner soil layers, and a lighter textured subsoil, this soil is similar to Minvale cherty silt loam, eroded gently sloping phase. Much of it occurs on slopes below the steep phases of Baxter, Bodine, and Sulphura soils. In most places only a thin remnant of the original surface soil remains, and there are some small spots so severely eroded that the red, firm subsoil is exposed. There are many short, shallow gullies. The present surface layer is brown to reddish-brown cherty silt loam.

In some places the soil has formed, in part, from weathered parent materials and from limestone. In some places chert has accumulated on the surface. There are a few outcrops of limestone and some of bedrock or shale.

This soil is strongly acid to very strongly acid. Its content of organic matter is low. Surface runoff is rapid

to very rapid, internal drainage is medium, and the water-holding capacity is low. The soil is permeable. The erosion hazard is high.

Included with this mapping unit are a few areas in which the soil is moderately phosphatic. Also included are a few uncleared, uneroded areas, and in these the soil has a thicker, darker surface layer than that of the typical soil.

Use and suitability (management group 10).—Most of this soil has been cleared, but a small part is still in hardwood forest. At least 50 percent is idle, and about 25 percent is pastured. The rest is used for crops, mainly corn and cotton.

This soil is poorly suited to tilled crops, but it is fairly well suited to pasture. Some of the forested areas are best kept in forest. Because of the steepness of the slopes, the content of chert, and the low moisture supply, this soil is hard to till and is poorly suited to the use of heavy machinery. Under good management fair pastures can be established and maintained. Crops on this soil respond well to lime and fertilizer. In dry periods grazing must be controlled. Contour tillage and long rotations are necessary.

Minvale cherty silty clay loam, severely eroded sloping phase (5 to 12 percent slopes) (Mf).—Except that it is on stronger slopes, is more eroded, and is shallower and more variable in depth to bedrock, this soil is similar to Minvale cherty silt loam, eroded gently sloping phase. It occurs in similar locations and is associated with the same soils. This soil has lost nearly all of the original surface soil through erosion and, in places, part of the subsoil. Tillage is now mostly in the subsoil. There are many short, shallow gullies.

As erosion has been uneven, the present surface layer varies. It ranges from brown to reddish-brown friable cherty silt loam to dark-brown to dark-red firm cherty silty clay loam. Chert has accumulated on the surface in places.

This soil is strongly acid to very strongly acid, and its content of organic matter is low. Runoff is rapid and internal drainage is medium. The water-holding capacity is low.

Use and suitability (management group 4).—About 60 percent of this soil is idle or abandoned, and a small part is in pasture. The rest is used for crops, mainly corn, cotton, and common lespedeza.

This soil is suited to pasture and to close-growing crops such as small grains and deep-rooted perennials, but yields are low. It is severely eroded and hard to work. A suitable rotation is corn, rye and vetch turned under, and sericea lespedeza grown for 3 to 4 years. Control of runoff water is needed, and lime and a complete fertilizer are needed for all crops.

Minvale cherty silty clay loam, severely eroded moderately steep phase (12 to 25 percent slopes) (Mg).—Except that it occurs on stronger slopes, is more eroded, has thinner layers, and is shallower and more variable in depth to bedrock, this soil is similar to Minvale cherty silt loam, eroded gently sloping phase. It occurs in similar locations and is associated with the same soils. Erosion has removed nearly all of the surface soil and, in places, part of the subsoil. There are many short, shallow gullies and some deeper ones that are hard to cross with farm machinery. The erosion has been irregular, and a few inches of the original surface soil remains in places. The present

surface layer is normally brown to dark-red, firm cherty silty clay loam, but in places it is friable cherty silt loam.

This soil is strongly acid to very strongly acid, and its content of organic matter is low to very low. Surface runoff is very rapid, and the water-holding capacity is low. The soil is permeable. It has a high erosion hazard.

Use and suitability (management group 10).—All of this soil has been cultivated. About 75 percent is now idle or abandoned. A small amount is used for pasture, and corn and cotton are grown on the rest.

This soil is poorly suited to crops and pasture. It is hard to work and yields are low. On some farms it is best used for trees. Under good management fair pastures can be established and maintained, but lime and a complete fertilizer are necessary. Yields will be low during dry periods.

Mountview silt loam, gently sloping phase (2 to 5 percent slopes) (Mh).—This well-drained soil of the uplands has formed under forest. The trees were chiefly various kinds of hickory and oak. The parent material is a layer of loess, 20 to 42 inches thick, that overlies cherty limestone residuum. Most of the soil is on broad ridges throughout the county and is in the Mountview-Dickson-Lobelville soil association. It is associated with the Dickson soils; Greendale silt loam; Lobelville silt loam, local alluvium phase; and with the shallow Mountview soils.

Except that it generally has no fragipan in the lower subsoil, this soil is similar to the Dickson soils. It is older than the Greendale and Lobelville soils, which have formed from similar parent materials, and its parent material has a thicker layer of loess than the shallow Mountview soils.

Profile description of undisturbed soil:

- 0 to 5 inches, pale-yellow very friable silt loam; upper 2 inches stained dark with organic matter; weak fine crumb structure.
- 5 to 10 inches, light yellowish-brown friable silt loam; weak fine crumb structure.
- 10 to 24 inches, yellowish-brown, friable to firm, light silty clay loam or heavy silt loam; contains some small chert fragments; moderate medium blocky structure.
- 24 to 28 inches, light yellowish-brown, friable, heavy silt loam or silty clay loam mottled faintly with light gray and yellow; contains a few small reddish chert fragments.
- 28 to 60 inches+, dark-brown, compact silty clay or clay to cherty silty clay; prominently mottled with yellow, reddish-brown, gray, and rust color; contains many small, angular chert fragments and many quartz and chert pebbles; becomes more cherty with depth; strong fine to medium blocky structure with many subangular faces.

The depth of the friable silty material ranges from about 20 to 42 inches. The amount of chert in the underlying residuum varies; in places much chert occurs at depths of about 24 inches. In many places, at depths of about 28 to 42 inches, there is a gray, mottled, weakly developed fragipan of friable silt loam about 4 inches thick between the loess and the cherty residuum. In most places chert fragments and pebbles occur on the surface and throughout the profile.

This soil is strongly acid to very strongly acid. It is moderately low in plant nutrients and low in content of organic matter. Surface runoff is medium to slow, internal drainage is medium, and the water-holding capacity is high. The soil is permeable in the upper layers, but the cherty residuum is somewhat less permeable.

Included with this soil are some areas of Dickson and some shallow Mountview soils that are too small to map separately.

Use and suitability (management group 5).—Most of this soil is in forest or has recently been cleared.

This soil is suited to many crops and to pasture. It is easy to work, but crops grown on it make only moderate yields. It is well suited to sweetpotatoes, strawberries, small grains, red clover, and sericea lespedeza. Alfalfa can be grown, but even under good management it makes moderate yields for only 3 or 4 years. If this soil is used for crops, a moderately short rotation is best. Lime and a complete fertilizer are needed for all crops and pasture.

Mountview silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Mk).—Except for having a thinner surface layer, this soil is similar to Mountview silt loam, gently sloping phase. It occurs in similar locations and is associated with the same soils. Much of it is near the communities of Center, Leoma, Liberty Grove, and Loretto.

The original surface soil remains on some of the broader areas, but in most places the subsoil has been mixed with the surface soil by tillage. The present surface layer is light yellowish-brown to yellowish-brown friable silt

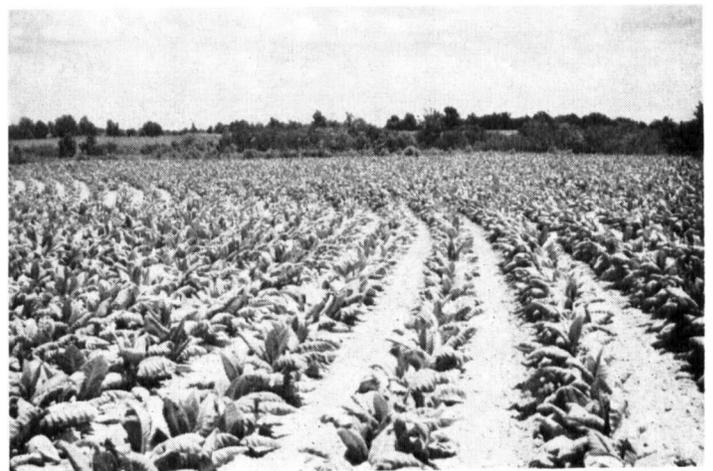


Figure 5.—Tobacco on Mountview silt loam, eroded gently sloping phase.

loam. Many small spots are so severely eroded that the subsoil of yellowish-brown, firm silty clay loam is exposed.

This soil is strongly acid to very strongly acid. Its content of organic matter is moderately low. Surface runoff and internal drainage are medium, and the water-holding capacity is high. The soil is permeable.

Use and suitability (management group 5).—Most of this soil is used for crops, mainly cotton, corn, common lespedeza, soybeans, small grains, and vetch. About 20 percent is in permanent pasture, and about 10 percent is idle.

This soil is well suited to nearly all of the crops commonly grown in the county. It is suited to pasture and is moderately suited to tree fruits. The soil is easy to work and makes moderate yields. It is suited to strawberries, tobacco (fig. 5), sweetpotatoes, small grains, vetch, and crimson clover. Red clover and sericea lespedeza can be grown if lime and fertilizer are applied. Alfalfa can be grown, but even under good management it will make moderate yields for only 3 or 4 years. If this soil is used for row crops, a winter cover crop and a moderately short rotation will keep soil losses at a min-

imum. Lime and a complete fertilizer are required to maintain yields.

Mountview silt loam, gently sloping shallow phase (2 to 5 percent slopes) (Mm).—This well-drained, shallow soil has formed on uplands. The parent material is a layer, 10 to 20 inches thick, of relatively chert-free, friable silty material that overlies cherty or very cherty limestone. Except that this soil is shallower in depth to the cherty material, has a subsoil that is somewhat more variable in color, and contains more chert, it is similar to Mountview silt loam, gently sloping phase.

This soil occurs on ridges in all parts of the county in the same general areas as Bodine, Dickson, and other Mountview soils. It is chiefly in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association.

Profile description of undisturbed soil:

- 0 to 7 inches, pale-yellow to light yellowish-brown very friable silt loam, the top part stained with organic matter; contains some angular chert.
- 7 to 15 inches, light-brown to yellowish-brown friable silt loam to silty clay loam; contains some angular chert; weak medium blocky structure.
- 15 inches +, light-brown friable cherty silty clay loam; contains chert fragments that are up to 4 inches in diameter; grades to very cherty material at depths of 4 to 5 feet.

The soil varies in content of chert, color of the subsoil, and color and texture of the underlying material. In many places small chert and quartz pebbles, some up to 2 inches in diameter, occur throughout the profile. A gray, silty, mottled layer, 3 to 4 inches thick, occurs in many places between the subsoil and the layer immediately below. In a few small places near Sims Ridge School, the surface layer is grayish-brown gravelly silt loam. In a few places mottled compact silty clay or cherty silty clay occurs at a depth of 20 inches. Chert and quartz pebbles occur throughout the upper layer in many places, and in places, below the layer of loess. A few areas are underlain by reddish cherty material.

This soil is strongly acid to very strongly acid. Its content of plant nutrients and organic matter is moderately low to low. Surface runoff is medium, and internal drainage is medium to rapid. The water-holding capacity of the upper layers is moderately low, and that of the lower layers is low to very low. The upper silty layers are very permeable, but the cherty layer varies in permeability.

Included with this soil are some small areas of Bodine, Dickson, and Mountview soils that are too small to map separately.

Use and suitability (management group 5).—Most of this soil is in forest that consists chiefly of hickory and oak. A small acreage has been cleared recently, and more is being cleared each year.

This soil is suited to most of the crops commonly grown in the county. Much of the soil, however, occurs on narrow ridges in isolated areas that are not easy of access, and these areas are best left in forest. The soil is easy to work but requires good management to make good yields. It is better suited to small grains than to corn and is well suited to strawberries, cotton, common lespedeza, red clover, and sericea lespedeza. It is not well suited to alfalfa, and even under good management alfalfa can be grown only 2 to 3 years. A moderately long rotation is best for cotton, and cotton must be well managed.

Mountview silt loam, eroded gently sloping shallow phase (2 to 5 percent slopes) (Mn).—Except that this soil has a thinner surface layer and is shallower over the underlying material, it is similar to Mountview silt loam, gently sloping shallow phase. It occurs in similar locations and is associated with the same soils. Much of the surface soil has been lost by erosion, and the subsoil is mixed with the remnants of the original surface soil. The present surface soil is grayish-brown to yellowish-brown friable silt loam. The subsoil is friable silty clay loam or silt loam.

In many places chert fragments occur on the surface, and there are some small cherty spots. The color, texture, and chert content vary at depths below 20 inches.

This soil is strongly acid to very strongly acid. Its content of organic matter is low to moderately low. Surface runoff is medium, internal drainage is medium to rapid, and the water-holding capacity is low. The upper part of this soil is permeable.

Use and suitability (management group 5).—Most of this soil is used for corn, cotton, common lespedeza, tobacco, soybeans, small grains, vetch, and crimson clover. Some areas have been used continuously for row crops since being cleared. About 20 percent is used for pasture, and 10 to 15 percent is idle.

This is one of the most extensive soils in the county, and it has a wide range of suitability. It is suited to pasture and to most of the crops commonly grown in the county. It is easy to work, but its use is somewhat limited by droughtiness. In many places there are old ineffective terraces that hinder tillage.

This soil is better suited to cotton, grain sorghum, and small grains than to corn. It is suited to tobacco, strawberries, crimson, red and white clover, vetch, orchard-grass, redtop, and tall fescue. All require lime and a complete fertilizer to maintain yields. The low water-holding capacity limits growth of sweetpotatoes. The soil is not well suited to alfalfa, which can be grown for only 2 or 3 years, even under good management.

If the soil is to be cropped continuously, the content of organic matter must be maintained. A 4-year rotation will help minimize losses of soil by erosion. Contour tillage is needed in many places, and in some places terraces are necessary.

Mountview silt loam, sloping shallow phase (5 to 12 percent slopes) (Mo).—Except that this soil is on stronger slopes, has slightly thinner soil layers, and is chertier, it is similar to Mountview silt loam, gently sloping shallow phase. It occurs in similar locations and is associated with the same soils.

Many of the areas are small and irregular in shape. In most places the slopes are short, but they are not uniform in some places.

This soil is strongly acid to very strongly acid. Except for the thin surface layer, the content of organic matter is low. Surface runoff is rapid, internal drainage is medium to rapid, and the water-holding capacity is moderately low. The soil is permeable.

Included with this soil are some small areas of Bodine cherty silt loams and of Mountview silt loam, gently sloping shallow phase.

Use and suitability (management group 6).—Most of this soil is in cutover forests consisting mainly of oak and hickory. The stands are generally thin. Some of the

forests are parts of large woodlands, and many of them have been burned over. A small acreage is cleared each year.

This soil is suited to most of the crops commonly grown in the county. It is easy to work but erosion is a hazard. Moderate yields are made under good management. Some areas are adjacent to hilly and steep cherty soils that are not suited to tillage and that are not easily accessible. These areas are best left in forest. The soil is well suited to crops that grow in cool, moist seasons, as small grains, vetch, crimson clover, and pasture. A suitable rotation is cotton, rye and vetch, and 3 or more years of tall fescue. Contour tillage and terracing are needed and are generally feasible. All crops and pastures need lime and a complete fertilizer.

Mountview silt loam, eroded sloping shallow phase (5 to 12 percent slopes) (Mp).—Except for having steeper slopes and a thinner surface layer, this soil is similar to Mountview silt loam, gently sloping shallow phase. It occurs in similar locations and is associated with the same soils. Much of the surface soil has been lost by erosion, and the subsoil is exposed in places. In most places tillage has mixed some of the subsoil with the surface layer. In many small areas the subsoil is exposed, and there are some short, shallow gullies. Most of the slopes are short.

The present surface layer is grayish-brown to yellowish-brown friable silt loam. The subsoil is yellowish-brown silty clay loam or heavy silt loam.

The thickness of the surface layer varies. In places chert fragments are scattered on the surface and in the subsoil.

This soil is strongly acid to very strongly acid. The content of organic matter is low. Surface runoff is rapid, internal drainage is medium to rapid, and the water-holding capacity is moderately low. The soil is permeable.

Included with this soil are some cherty areas too small to be mapped separately.

Use and suitability (management group 6).—Most of this soil is used for crops and pasture. About 20 percent is idle, and part of this is growing up in weeds and bushes. The main crops grown are cotton, corn, common lespedeza, small grains, and vetch. The pastures are mostly unimproved. There are many old terraces.

This soil is suited to pasture and to most of the crops commonly grown in the county. Yields are moderate under good management but are lower during dry periods. The soil is easy to work, but erosion is a hazard. It is suited to common lespedeza, red clover, sericea lespedeza, and most pasture plants. Alfalfa does not grow well, even though heavily fertilized. A long crop rotation is best on this soil, and contour tillage is necessary. On some farms terracing is needed. Lime and a complete fertilizer are necessary to maintain yields.

Mountview silty clay loam, severely eroded sloping shallow phase (5 to 12 percent slopes) (Mr).—Except that this soil has stronger slopes and is eroded, it is similar to Mountview silt loam, gently sloping shallow phase. It occurs in similar locations and is associated with the same soils. Most of the original surface layer has been lost by erosion. The subsoil is exposed in many places, and there are many shallow gullies. The subsoil has been mixed with the surface soil by tillage, and the present surface layer is grayish-brown to yellowish-brown friable

silty clay loam or silt loam. The subsoil is a yellowish-brown friable to firm silty clay loam.

Erosion has been uneven, and as a result the surface layer varies in color and texture. There are some un-eroded spots. In many places there is chert in the surface layer and in the subsoil. In places the underlying cherty material is exposed.

This soil is strongly acid to very strongly acid. Its content of organic matter is very low. Surface runoff is rapid, internal drainage is medium to rapid, and the water-holding capacity is low.

Included with this soil are a few small cherty areas that are too small to be mapped separately.

Use and suitability (management group 10).—Nearly all of this soil has been cultivated. About 50 percent is now idle or abandoned, and some of these areas are reverting to forest. About 25 percent is in pasture, and the rest is in crops that are mainly cotton, corn, common lespedeza, and rye and vetch.

This soil is poorly suited to crops or pasture. The erosion hazard is high, and yields are low. On most farms the soil is best used for pasture. Under good management fair pastures can be established and maintained, but yields will be lowered in dry seasons. Some areas are adjacent to steeper and more cherty soils. These are best used for trees, and loblolly and short leaf pines will grow well. Sericea lespedeza can be grown, but it requires lime and a complete fertilizer. The soil can be used for tilled crops in a long rotation after it has been built up by growing well-managed sod crops.

Pace cherty silt loam, eroded sloping phase (5 to 12 percent slopes) (Pc).—This moderately well drained to well drained soil occurs on foot slopes. It has formed under a forest made up chiefly of hickory and oak trees. The parent material is old slopewash derived mainly from the cherty Bodine soils that are on the steeper slopes above. This soil occurs in the same general areas as the Bodine, Captina, Greendale, Lee, and Lobelville soils. Most of it is in the Bodine-Mountview (shallow)-Greendale-Lobelville and the Ennis-Humphreys-Etowah-Captina soil associations.

This soil contains less chert than the Bodine soils. It has no fragipan and is more cherty than the Captina soils that also occur on terraces. The soil has stronger slopes, is more cherty, and is better developed than the Greendale soils of bottom lands. It is older and better drained than the Lee and Lobelville soils that are also on bottom lands.

Much of the original surface soil has been lost by erosion. In many places part of the subsoil has been mixed with the surface soil.

Profile description:

- 0 to 10 inches, grayish-brown to yellowish-brown friable cherty silt loam; most of the chert is $\frac{1}{2}$ to 1 inch in diameter, but some is as much as 4 inches across.
- 10 to 20 inches, yellow to yellowish-brown friable to firm cherty silty clay loam; has a few fine distinct mottles of rust and gray in lower part.
- 20 to 26 inches, mottled light yellowish-brown, gray, and strong-brown firm cherty silty clay loam; chert fragments are 1 to 4 inches in diameter; weak to moderate medium blocky structure.
- 26 to 48 inches, mottled brown, gray, and rust-colored compact beds of angular chert.

The surface layer ranges from 4 to 10 inches in thickness. In places the depth to chert beds or shale is 24

inches. In some places the mottled layer is absent from the lower part of the profile. The subsoil, in a few areas, is a friable cherty silt loam. In places pebbles up to 1 inch in diameter are on the surface and throughout the profile.

This soil is strongly acid to very strongly acid. The content of organic matter and plant nutrients is low. Surface runoff is rapid, internal drainage is medium to slow, and the water-holding capacity is low. The upper layers of this soil are permeable. Most of this soil receives runoff from the steeper slopes above. In many places water seeps onto it from the bases of steeper slopes. These areas are poorly drained.

Use and suitability (management group 7).—Most of this soil is used for crops and pasture, and only about 15 percent is idle. Pastures, mainly unimproved, occupy much of the soil, and the rest is used for crops. The principal crops are corn, cotton, common lespedeza, and some tobacco. Yields are low.

This soil is suited to pasture and to most of the crops grown in the county. It is easy to work but it is erodible, and some small areas are too cherty to cultivate. This soil is well suited to rye and vetch but is not well suited to alfalfa. The water-supplying capacity is too low for corn to make high yields. The crops require lime and a complete fertilizer.

Pace cherty silt loam, sloping phase (5 to 12 percent slopes) (Pb).—Except that this soil is less eroded and has a thicker surface layer, it is similar to Pace cherty silt loam, eroded sloping phase. It occurs in similar locations and is associated with the same soils. A thin layer of leaves and forest litter covers the surface. Where the soil is undisturbed, the upper 1 or 2 inches is stained a dark color. The surface layer is dark gray to light yellowish brown.

This soil is strongly acid to very strongly acid. Except for a thin surface layer, it is low in organic matter. Surface runoff is rapid, and internal drainage is medium to slow. The water-holding capacity is low. The upper part of the soil is permeable, but permeability in the lower layers varies.

Use and suitability (management group 7).—All of this soil is in cutover forests of hickory, oak, and many other kinds of trees. Many of the areas are small and irregular and are not easy of access. These are best left in forest.

This soil is suited to pasture and to most of the crops grown in the county. It is well suited to rye and vetch, but it is not well suited to alfalfa and corn. Although this soil is easy to work, it is erodible and not well suited to intensive use. Yields are generally low. A rotation of cotton, small grain, and then pasture for 2 to 4 years will help to control runoff and keep erosion to a minimum. Lime and a complete fertilizer are needed for all crops.

Pace cherty silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Pa).—Except that this soil has milder slopes and somewhat thicker soil layers, it is similar to Pace cherty silt loam, eroded sloping phase. It is associated with Bodine soils and with other Pace soils. In most places part of the surface soil has been lost by erosion, but tillage is still mostly in the original surface soil. A small acreage that is uncleared has a covering of forest litter on the surface.

This soil is strongly acid to very strongly acid, and the content of organic matter is low. Surface runoff is medium, and internal drainage is medium to slow. The

water-holding capacity is low. The upper part of the soil is permeable, but the lower layers vary in permeability and are less permeable.

Use and suitability (management group 7).—Most of this soil has been cultivated. A small part is still in cutover forest made up mainly of hickory and oak trees, and a small part is idle. About half of the cleared acreage is in pasture, and the rest is used for corn, cotton, common lespedeza, truck crops, and farm gardens.

This soil is fairly well suited to pasture and to small grains, vetch, common lespedeza, and sericea lespedeza. Although the chert hinders tillage, the soil is easy to work and there is little risk of erosion. It is droughty, however, and yields are low under the usual management. The use of close-growing crops in a rotation lasting 3 to 5 years will help keep erosion to a minimum. Lime and a complete fertilizer are needed to maintain yields.

Pace cherty silt loam, eroded moderately steep phase (12 to 25 percent slopes) (Pd).—Except that this soil has stronger slopes and a somewhat thinner surface layer, it is similar to Pace cherty silt loam, eroded sloping phase. Most of it is on foot slopes below steep Bodine and Sulphura soils. It is widely scattered throughout the Bodine-Mountview (shallow)-Greendale-Lobelville soil association. Much of the original surface layer has been lost by erosion. There are many short, shallow gullies and a few deeper ones.

In some places depth to bedrock is 3 feet or less, and there are a few rock outcrops. Chert has accumulated on the surface in some areas.

This soil is strongly acid to very strongly acid. Surface runoff is very rapid, and internal drainage is medium to slow. The water-holding capacity is low. The soil varies in permeability, but the lower layers are generally slowly permeable.

Included with this soil are some small uncleared areas. These have a thin cover of forest litter and a surface layer that is thicker than that of the typical soil. Also included are a few small severely eroded spots. Here the subsoil is exposed and there are many gullies.

Use and suitability (management group 10).—Most of this soil has been cultivated but is now idle or abandoned. The uncleared areas are in cutover forest. A small acreage is used for corn.

This soil is poorly suited to crops. On many farms it is best used for forest. The soil is hard to work. If well fertilized, pastures can be established and maintained. Even under good management, however, yields of both crops and pastures are low because the soil is droughty.

Pace cherty silty clay loam, severely eroded sloping phase (5 to 12 percent slopes) (Pe).—Except that this soil is more eroded and of shallower and more varied depth to bedrock, it is similar to Pace cherty silt loam, eroded sloping phase. It differs further in having a finer textured surface soil. It occurs in similar locations and is associated with the same soils. Much of the surface soil has been lost by erosion, and the subsoil is exposed in places. There are many short, shallow gullies. The present surface soil ranges from light grayish brown to yellowish brown in color and from silt loam to silty clay loam in texture. In most places tillage is in the yellowish-brown subsoil.

In some places chert has accumulated on the surface, and a few small areas are almost too cherty to cultivate.

This soil is strongly acid to very strongly acid. The content of organic matter is low. Surface runoff is rapid,

internal drainage is medium to slow, and the water-holding capacity is low. Permeability varies, particularly in the lower layers.

Use and suitability (management group 10).—All of this soil has been cultivated, and most of it is now idle or abandoned. On some areas trees are slowly encroaching. A small acreage is used for pasture, corn, cotton, and common lespedeza.

This soil is poorly suited to crops and pasture. On many farms it is best used for trees. The soil is hard to work, and the risk of erosion is high. Pastures can be established, but the cost is high and yields are low.

Pace silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Pf).—This well-drained soil has formed under a forest made up chiefly of hickory and oak trees. The parent material has washed from such soils as the Baxter, Bodine, Dickson, and Mountview. The soil occurs in small areas throughout the county in association with Bodine, Captina, Lobelville, and Mountview soils. Although there are some small, uneroded areas, which have a thicker surface layer, most of this soil has lost part of the surface layer through erosion. Tillage has mixed some of the subsoil with the surface layer.

Profile description:

- 0 to 6 inches, light yellowish-brown to brown very friable silt loam; contains some chert fragments as much as 1 inch in diameter.
- 6 to 28 inches, light yellowish-brown to brown, friable, light silty clay loam; contains many chert fragments up to 1 inch or more in diameter; moderate medium blocky structure.
- 28 to 48 inches+, gray, mottled, very cherty silty material.

Pebbles up to 1 inch in diameter occur in places on the surface and throughout the profile. In places the profile is 24 to 40 inches thick and overlies cherty layers, compact chert beds, shale, or limestone. In some places a slightly mottled layer of friable silt loam, 4 to 6 inches thick, occurs at depths of 22 to 30 inches. The amount of chert in the surface layer varies somewhat, but the chert does not hinder tillage.

This soil is strongly acid to very strongly acid. The content of organic matter is moderate. Surface runoff and internal drainage are medium. The uppermost 24 inches is permeable. In places the chert in the substratum hinders internal drainage and lowers the water-holding capacity. In a few places water seeps onto the soil from the bases of steeper slopes, and here the soil is somewhat poorly drained or poorly drained. The small uneroded areas are more productive than the normal soil.

Use and suitability (management group 5).—This soil is fairly well suited to pasture and to most of the crops grown in the county. Alfalfa can be grown, but it needs to be well fertilized. The soil is easy to work, but good management is needed for high yields. Heavy farm machinery can be used on it without difficulty. Erosion can be kept to a minimum if a moderately short rotation is used and good management is practiced.

Pace silt loam, eroded sloping phase (5 to 12 percent slopes) (Pg).—Except for having stronger slopes, slightly thinner layers, and more chert scattered on the surface, this soil is similar to Pace silt loam, eroded gently sloping phase. It occurs in similar places and is associated with the same soils. From 25 to 75 percent of the original surface soil has been lost by erosion, and there are many short, shallow gullies.

This soil is strongly acid to very strongly acid. The content of organic matter is moderate. Surface runoff is rapid, internal drainage is medium, and the water-holding capacity is moderate. The uppermost 20 to 40 inches of the soil is permeable.

Use and suitability (management group 6).—Most of this soil is used for crops and pasture, and only a small part is in cutover forest. The main crops are cotton, corn, tobacco, and common lespedeza. The pastures are mainly unimproved.

This soil is suited to pasture and to most of the crops commonly grown in the county. It is easy to work. Yields are moderate under good management. The soil is suited to red clover, common lespedeza, and sericea lespedeza. It is not suited to alfalfa, which will last for only 2 or 3 years, even under good management. In dry seasons pasture yields are low. Contour tillage and close-growing crops used in a moderately long rotation will help to prevent erosion and conserve moisture. In some places diversion ditches are needed to control runoff from higher soils. Lime and a complete fertilizer are needed for all crops.

Pembroke silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Pk).—This well-drained soil of the uplands has formed under hardwood forest. The trees were various kinds of hickory, red and white oaks, walnut, yellow-poplar, and other trees desirable for timber. The parent material is a layer of loess, 20 to 42 inches thick, that overlies weathered limestone. The soil occurs in the central part of the county in association with Decatur and Emory soils. Although it is not extensive, it is useful for agriculture. Most of it is in the Pembroke-Decatur-Emory soil association. In a few uneroded areas, this soil has a thicker surface layer than normal and is on slightly milder slopes. In most places, however, between 25 and 75 percent of the original surface layer has been lost by erosion.

Except that this soil has a more friable upper subsoil, it is similar to the Decatur silt loams.

Profile description:

- 0 to 6 inches, dark-brown to dark reddish-brown very friable silt loam; very weak medium crumb structure.
- 6 to 28 inches, reddish-brown to dark reddish-brown friable to firm silty clay loam; redder and finer textured in lower part; weak medium blocky structure.
- 28 to 42 inches, dark reddish-brown to dark-red firm silty clay loam; has many small, dark concretions in and below this layer; moderate to strong medium blocky structure.
- 42 to 60 inches+, dusky-red compact silty clay or clay; contains some yellow angular chert fragments and many small, dark concretions; strong medium to coarse blocky structure.

The surface layer ranges from about 4 to 7 inches in thickness. Cherty or chert-free limestone occurs at depths of 8 to about 40 feet in places. In many places the chert-free limestone has weathered to red clay. In some areas the profile is more brown than red, and here the surface layer is brown and the subsoil is brown or reddish brown. The underlying material in these areas is friable reddish-brown silty clay loam, which occurs at depths of several feet. In a few places mottles and medium-sized concretions occur at depths of 36 to 42 inches.

This soil is medium acid to strongly acid. The content of organic matter is moderate. Surface runoff and internal drainage are medium, and the water-holding capacity is high. The soil is moderately permeable. The

subsoil contains a good supply of minerals for deep-rooted crops.

Use and suitability (management group 3).—Most of this soil is used for crops and pasture. Only a small part is idle.

This soil is well suited to all the crops commonly grown in the county, including alfalfa. It is easy to work and yields are high. The soil is well suited to cotton, corn, tobacco, small grains, soybeans, red and white clovers, common lespedeza, orchardgrass, tall fescue, winter legumes, strawberries and other truck crops, and tree fruits. Alfalfa will make good yields for 4 years or more, but it requires lime and fertilizer. Rotations in which row crops are grown every other year or every third year are suited.

Pembroke silt loam, level phase (0 to 2 percent slopes) (Ph).—Except that this soil is uneroded, nearly level, and has thicker layers and a browner, less red subsoil, it is similar to Pembroke silt loam, eroded gently sloping phase. The surface layer is between 6 and 10 inches thick. This soil is in the Pembroke-Decatur-Emory soil association in the same general areas as Decatur, Emory, and other Pembroke soils.

This soil is medium acid to very strongly acid. Its content of plant nutrients and organic matter is moderate. Surface runoff is slow to very slow, internal drainage is medium, and the water-holding capacity is high. The soil is permeable.

Use and suitability (management group 3).—Most of this soil is cropped, and less than 10 percent is pastured. It is well suited to pasture and to most of the crops grown in the county. The soil is easy to work and yields are high. If drainage is improved, alfalfa and strawberries can be grown. A short rotation that includes the use of winter cover crops is desirable. Lime and a complete fertilizer are needed, and the response to these is good.

Robertsville silt loam (0 to 3 percent slopes) (Ra).—This poorly drained soil has formed on stream terraces under a forest of water-tolerant trees. The parent material is old alluvium that has washed from soils formed over cherty limestone capped, in places, by a thin layer of loess. This soil occurs in nearly level to slightly depressed areas and at the bases of steep slopes occupied by Bodine soils. It occurs in the same general areas as Captina, Etowah, Humphreys, and Taft soils. Most of it is in the Ennis-Humphreys-Etowah-Captina soil association.

Except that this soil is older and has a fragipan, it is similar to the Lee soil of the bottom lands. It is grayer and not so well drained as the Captina, Etowah, Humphreys, and Taft soils, also on terraces, although these soils have formed from similar parent material. The Captina and Taft soils also have a pan layer, but the Etowah and Humphreys soils do not.

Profile description:

- 0 to 6 inches, light-gray to gray very friable silt loam.
- 6 to 18 inches, light-gray friable heavy silt loam mottled with yellow and rust color.
- 18 to 36 inches (pan), mottled gray, yellow, and rust-colored compact silty clay loam to silty clay; massive, but breaks to strong to moderate medium blocky aggregates.
- 36 to 48 inches+, mottled gray, yellow, and rust-colored compact silty clay; contains some angular chert fragments.

In places a few fine chert fragments occur on the surface and throughout the profile. Chert beds or shale occur at depths of 48 inches or more in places. In places the pan occurs at depths of 12 to 24 inches and is between 12 and

24 inches thick. The pan ranges from silty clay loam to clay in texture and is compact and very slowly permeable. Small concretions are common throughout the profile.

This soil is very strongly acid to extremely acid. The content of organic matter is low. Surface runoff is very slow to ponded, internal drainage is very slow, and the water-supplying capacity is low.

Use and suitability (management group 9).—Most of this soil is used as woodland, some of which is pastured. About 20 percent is idle. A few areas are used for corn, sorghum, soybeans, or common lespedeza.

This soil is poorly suited to most of the crops commonly grown in the county. It is easy to work but is usually too wet or too dry for tillage. On many farms it is best used for trees. This soil is fairly well suited to pasture, but the quality is poor and yields are low. Tall fescue and whiteclover, however, will produce moderate pasture yields under good management. This soil is fairly well suited to soybeans, sorghum, and other late spring crops. If it is drained, it is fairly well suited to common lespedeza. Beds or open ditches can be used to improve surface drainage; they will broaden the use and increase yields. The soil is not suitable for tile drainage. Lime and a complete fertilizer are required for even moderate yields.

Rockland (12 to 65 percent or more slopes) (Rb).—This miscellaneous land type occurs on steep, almost vertical slopes, mainly along creeks. More than 50 percent of it consists of ledges and outcroppings of cherty limestone, chert-free limestone, and shale. In some places there is a thin covering of soil, but generally the soil material occurs only in cracks and crevices in the rocks. The soil material varies in color and texture but is mostly dark-gray silt loam or silty clay loam. The steeper bluffs are rocky and bare. On the rest of the land there is a thin stand of various kinds of hardwood and coniferous trees, as redbud, redcedar, and blackjack, chestnut, post, and red oaks. Most of this land type is in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association.

Use and suitability (management group 11).—This miscellaneous land type is mainly in cutover forest. It is of little use for crops or pasture. In some places it is so rocky as to be of little value for trees.

Sango silt loam, gently sloping phase (2 to 5 percent slopes) (Sb).—This is a somewhat poorly drained to moderately well drained soil of the uplands. It has formed under a hardwood forest consisting mainly of hickory, blackjack and post oaks, and water-tolerant trees. The parent material was a layer of loess, 20 to 42 inches thick, underlain by weathered cherty limestone. This soil is in the same general areas as Dickson, Guthrie, and Lawrence soils. Most of it is in the Sango-Lawrence-Guthrie soil association.

This soil is yellower and is not so well drained as the Dickson soils. It is less mottled and better drained than the Guthrie and Lawrence soils.

Profile description:

- 0 to 4 inches, light-gray to light yellowish-brown very friable silt loam; surface stained with organic matter.
- 4 to 20 inches, olive-yellow to light yellowish-brown, friable to firm, light silty clay loam; mottled with light gray and rust at depths of 16 to 18 inches; contains a few chert fragments up to ½ inch in diameter; very weak medium blocky structure.
- 20 to 30 inches (fragipan), mottled light-gray, rust-colored, pale-yellow, and brownish-yellow, firm to compact, light

silty clay loam; contains some angular chert fragments up to 1 inch in diameter; weak medium blocky structure.

30 to 40 inches +, mottled light-gray, olive-yellow, rust-colored, and strong-brown, compact silty clay loam; contains some angular chert fragment up to 2 inches in diameter; number of fragment increases with depth; strong to moderate medium blocky structure; gradual transition to mottled firm cherty silty clay loam at depths of about 4 feet.

In forested areas there is a thin layer of leaves and litter. In places the fragipan is between 3 and 20 inches thick.

This soil is very strongly acid to extremely acid. It is low to very low in content of organic matter and in plant nutrients. Surface runoff and internal drainage are slow, and the water-holding capacity is low. The upper 18 or 20 inches is permeable, but the lower subsoil is very slowly permeable. The soil is saturated until late in spring, and it drains slowly.

Included with this soil are some small areas of Dickson and Lawrence soils that were too small to map separately.

Use and suitability (management group 8).—Most of this soil is in cutover forest. The trees are mainly small blackjack and post oaks, but briars, broomsedge, and wild honeysuckle bushes are encroaching.

This soil is only fairly well suited to tilled crops, and on some farms it is best used for pasture or trees. It is easy to work but is wet in spring and droughty in summer. Yields are low, even under good management. The soil is fairly well suited to cotton, sorghum, soybeans, common lespedeza, redtop, sericea lespedeza, tall fescue, white-clover, rye, and vetch. It is not well suited to alfalfa, corn, and wheat. Lime and a complete fertilizer are required for all crops, but the response is only moderate.

Sango silt loam, eroded gently sloping phase (2 to 5 percent slopes) (Sc).—Except that this soil is eroded and has a thinner surface layer, it is similar to Sango silt loam, gently sloping phase. It is associated with the same soils. Part of the surface layer has been lost by erosion, and the subsoil is mixed with the remaining surface soil. There are many small spots so severely eroded that the subsoil is exposed. The surface soil is light colored when dry.

This soil is very strongly acid to extremely acid and is low to very low in organic matter. Surface runoff and internal drainage are slow, and the water-holding capacity is low. The soil is very slowly permeable at depths below about 20 inches.

Use and suitability (management group 8).—All of this soil has been cultivated. About 10 percent is now idle, and about 50 percent is in pasture. On the rest the main crops are cotton, corn, soybeans, sorghum, common lespedeza, rye, and vetch. Some wheat is grown, and a few areas are used for tomatoes.

This soil is fairly well suited to crops and pasture. When it is not too wet or too dry, it is easy to work. The soil is droughty, and yields are low even under good management. Lime and a complete fertilizer are needed for all crops and pasture, but the response is only moderate.

Sango silt loam, level phase (0 to 2 percent slopes) (Sa).—Except that this soil is nearly level and has lost little of the surface soil through erosion, it is similar to Sango silt loam, gently sloping phase. It occurs in similar locations and is associated with the same soils.

Some of this soil is in hardwood forest, and in these areas there is a thin covering of leaves and twigs. Some of it receives runoff from soils on higher slopes.

This soil is very strongly acid to extremely acid. The content of organic matter in the cleared areas is very low. Surface runoff is slow to very slow, internal drainage is slow, and the water-holding capacity is low. At depths below 20 inches, the soil is very slowly permeable.

Included with this soil are a few small areas of Lawrence soils that are too small to map separately.

Use and suitability (management group 8).—Most of this soil is used for crops and pasture. About 20 percent is uncleared, and only a small part is idle. About 30 percent is in pasture, and the rest is in crops, mainly corn, soybeans, sorghum, common lespedeza, and rye.

This soil is only fairly well suited to crops and pasture, and yields are low. If not too wet or too dry, it is easy to work. Fair pastures can be established and maintained under good management, but yields will be low in dry seasons. The soil is well suited to rye and vetch and is suited to common lespedeza, redtop, sericea lespedeza, tall fescue, and whiteclover. It is only fairly well suited to cotton, sorghum, and soybeans and is not well suited to alfalfa and corn. Lime and a complete fertilizer are required for all crops.

Sulphura cherty silt loam, steep phase (25 to 65 percent slopes) (Se).—This is an excessively drained, shallow soil. It has formed under a hardwood forest made up chiefly of hickory and oak trees but with some cucumber and poplar trees. This soil occurs where creeks have cut through cherty formations into the underlying shale. Most of it is along Knob, Shoal, and Weakley Creeks in the Bodine-Mountview (shallow)-Greendale-Lobelville soil association. The parent material is noncalcareous and nonphosphatic shale and cherty limestone. The shale is gray, green, or bluish in color and contains much chert. In places the parent material has a layer of colluvial material, as much as 20 inches thick, that has washed from Baxter and Bodine soils.

This soil is shallower over underlying material than the upland Baxter and Bodine soils, and it has a browner surface soil. It is also shallower than the Minvale and Pace soils that are on foot slopes in the same soil association.

Profile description:

0 to 7 inches, pale-brown to dark-brown friable cherty silt loam; contains many chert fragments as much as 4 inches in diameter.

7 to 48 inches +, light-green noncalcareous shale mottled and stained with black and yellow.

The surface layer ranges from about 6 to 20 inches in thickness. In many places shale and rocks outcrop, and in some places there are many shale chips. In some places where the shale has weathered more, the subsoil, at depths of about 6 to 24 inches, is yellowish-brown, friable, light silty clay loam. In places the shale layer is 50 or more feet thick, and in many places chert layers are interbedded with the shale.

Although it varies, generally this soil is strongly acid to very strongly acid and has a low content of organic matter. Surface runoff is very rapid, internal drainage is rapid, and the water-holding capacity is low. The soil is permeable above the shale layer.

Included with this soil are some areas of Baxter cherty silt loam, steep light colored phase, and of Bodine cherty silt loam, steep phase. Also included are a few areas of Minvale cherty silt loam, moderately steep phase, and a few areas that are low to medium in phosphorus.

Use and suitability (management group 11).—All of Sulphura cherty silt loam, steep phase, is in hardwood forest that has been cut over several times. This soil is not suited to crops or pasture and is best suited to forest. It is droughty, and the steep slopes and chert hinder tillage.

Sulphura cherty silt loam, eroded steep phase (25 to 65 percent slopes) (Sf).—Except that this soil is eroded and has a thinner surface layer, it is similar to Sulphura cherty silt loam, steep phase. It is associated with Baxter, Bodine, Minvale, and other Sulphura soils. There are some shallow gullies, but erosion has been uneven and the thickness of the surface layer varies. In some places nearly all of the surface soil has been lost by erosion, and there are many more gullies than in the typical soil.

This soil is strongly acid to very strongly acid, and the content of organic matter is low. Surface runoff is very rapid, internal drainage is rapid, and the water-holding capacity is low. The permeability of the soil below the surface layer is slow.

Included with this soil are a few areas that are slightly to moderately phosphatic.

Use and suitability (management group 11).—All of this soil has been used for crops or pasture. About 35 percent is now idle, and some areas are reverting to forest. About 60 percent is in pasture, and on the rest corn is the chief crop.

This soil is poorly suited to pasture but is somewhat more poorly suited to crops. It is droughty, and the steep slopes and chert hinder tillage. On some farms the soil is best used for pasture, but yields will be low. Some areas are best used for trees.

Sulphura cherty silt loam, eroded moderately steep phase (12 to 25 percent slopes) (Sd).—Except that this soil occupies less steep slopes, is eroded, and has a thinner surface layer, it is similar to Sulphura cherty silt loam, steep phase. It occurs in similar locations and is associated with the same soils. Part of the surface soil has been lost by erosion, and there are many short, shallow gullies. About 20 percent of this soil is uncleared, and in these places the surface soil is thicker and has a layer of forest litter. Another 20 percent of the soil occurs chiefly on narrow ridges, on slopes of 5 to 12 percent. In a few places most of the original surface layer has been lost by erosion.

This soil is strongly acid to very strongly acid and is low in content of organic matter. Runoff is very rapid, internal drainage is rapid, and the water-holding capacity is low. Permeability is variable but is generally slow.

Use and suitability (management group 10).—All of this soil has been used for crops and pasture. About 25 percent is now idle, and at least 50 percent is used for pasture. The rest is used for crops, chiefly corn.

This soil is poorly suited to crops and pasture. It is hard to work and yields are low. This soil is suited to sericea lespedeza, and pastures can be established, but yields will be low in dry seasons. Lime and a complete fertilizer are needed, and grazing must be controlled. Some areas are best used for trees.

Taft silt loam (0 to 3 percent slopes) (Ta).—This somewhat poorly drained soil of the terraces has formed under a hardwood forest. The trees were hickories, oaks, and various kinds of water-tolerant trees. The parent material was old general alluvium. The alluvium was washed from soils on steeper slopes, which were formed chiefly

from cherty limestone that, in places, had a capping of loess. In some places the parent material washed from upland soils, as the Mountview and Dickson.

Most of this soil occurs in slight depressions on second bottoms. It is associated with Captina, Humphreys, and Robertsville soils and is mainly in the Ennis-Humphreys-Etowah-Captina soil association. In some areas it is associated with Dickson, Lee, and Mountview soils.

This soil is less well drained and lighter in color than the Captina soils and is better drained and not so gray as the Robertsville soil. Except that it has formed from alluvium and is on terraces, it is similar to the upland Lawrence soils. This soil, like the Captina, Lawrence, and Robertsville, has a fragipan.

Profile description:

- 0 to 6 inches, light-gray to yellow very friable silt loam mottled with rust color, contains a few angular chert fragments.
- 6 to 18 inches, yellow to light yellowish-brown, friable, heavy silt loam; layer spotted with gray and highly mottled in the lower part; weak fine to medium blocky structure.
- 18 to 26 inches (fragipan), light yellowish-brown friable silty clay loam to compact heavy silt loam; layer highly mottled with light yellow, gray, and rust colors; contains a few chert fragments; weak fine to medium blocky structure.
- 26 to 42 inches +, mottled light-gray, pale-yellow, and rust-colored compact silt loam, silty clay loam, or silty clay; contains many chert fragments that are up to 2 inches in diameter.

In places the subsoil is silty clay loam. In a few small areas, the surface layer has been lost by erosion and yellowish, firm silty clay loam is exposed. The content of chert varies somewhat but in no place hinders tillage. The depth to the fragipan ranges from about 16 to 30 inches. In places, at depths below 42 inches, there are chert beds, shale, or limestone rocks.

This soil is strongly acid to very strongly acid. The content of organic matter and plant nutrients is low. Surface runoff is very slow, and internal drainage is slow to very slow or none. The water-supplying capacity is low. The surface layer and upper subsoil are permeable, but the fragipan is very slowly permeable. The water table is at or near the surface in wet seasons, especially in winter and early in spring. During dry periods the soil is droughty.

Included with this soil are a few areas, too small to map separately, in which Minvale, Pace, Robertsville, and Taft soils are intermingled.

Use and suitability (management group 8).—About 60 percent of Taft silt loam is cleared, and about half of this is idle. Much of the soil is used along with associated Captina and Robertsville soils. Corn, cotton, soybeans, common lespedeza, and redbud are the main crops.

Use of this soil is limited by poor drainage. Although the soil is easy to work, it is either too wet or too dry for tillage. Yields are low and crop failures are common. Some areas are best kept in forest.

This soil is fairly well suited to pasture and to soybeans, tall fescue, whiteclover, sorghum, common lespedeza, and redbud. It is not well suited to corn, alfalfa, and crimson clover. The use of beds or open ditches to improve surface drainage would increase crop yields in places. As a rule, tile drainage is not feasible. Under good management crops to which the soil is suited can be used in short rotations. Lime and a complete fertilizer are needed to maintain even moderate yields.

Use and Management of Soils

Many farmers of Lawrence County now use and manage their soils so as to maintain good yields at a minimum cost. The farmers who practice good management have yields that are much higher than the average for the county. In general, these farmers do the following things:

1. Use good crop varieties that are suited to the county.
2. Follow a cropping sequence that will control and use water to the best advantage. On most of the sloping to moderately steep soils of the uplands and terraces, the rotation will include a legume to add nitrogen; a tilled crop to control weeds; a deep-rooted crop to forage for nutrients in the subsoil and to increase permeability; and pasture, meadow, or a green-manure crop to increase or maintain organic matter, to improve tilth, and to control runoff and keep erosion losses at a minimum.
3. Return barnyard or green manure to the soil to maintain the supply of nitrogen and to add fresh organic matter.
4. Apply lime, phosphate, nitrogen, or potash, or a combination of these materials if needed. (The county agent should be consulted about testing the soil before lime or fertilizer is added.)
5. Prepare the seedbed carefully. (The practices used by farmers in the county who use good management or the suggestions of the experiment station regarding the time and rate of planting should be followed.)
6. Use suitable measures to control weeds, insects, and diseases.

The practices listed are a part of good management almost anywhere. Another important part of good management, however, is knowing the characteristics of the soils and applying practices that will allow them to produce at their best now and for the years to come.

In the following pages management is discussed in terms of the strong points and deficiencies of the soils. The soils have been divided into 11 management groups. For each group, except management group 11, there is a table listing the soils of the group and showing average yields to be expected under two levels of management for the crops listed. For all of the groups, there is a description of the important characteristics common to the soils

of the group and a discussion of the use and management needs of the soils.

In columns A of the yield tables are estimated average acre yields under common management. Under this management a rather poorly defined system of crop rotation has been used, adequate lime and fertilizer have not been applied, and drainage has not been provided for some of the soils that are too wet. In columns B are yields to be expected under improved management.

Management Group 1

The soils of this group are shown in table 6. They are level to gently sloping and occur on bottom lands. The soils are well drained to somewhat poorly drained and have a moderate to high water-supplying capacity. They are medium acid to very strongly acid. The supply of plant nutrients is moderate and is replenished by sediments from the floodwaters of adjacent streams. The soils of this group occupy 4.4 percent of the county. They are desirable soils for growing crops and pasture.

Use and management.—Many areas of these soils, along streambanks and on the adjacent slopes, are shaded by trees. Some areas are uncleared, and a few inaccessible areas are idle. The soils are used intensively to grow corn, sorghum, soybeans, and common lespedeza, which produce fair to good yields. Cotton is not grown extensively because it makes excessive stalk growth and is slow to open. Some vetch and crimson clover are grown for green manure or seed.

Floods in winter and early in spring limit the use of these soils. The soils are generally easy to work, although in some places chert hinders tillage. They can be tilled at a wide range of moisture content without serious injury. Farm machinery can be used satisfactorily.

These soils are well suited to corn, soybeans, sorghum, Ladino and white clovers, tall fescue, sudangrass, lespedeza, annual hay crops, and summer pasture. They are not so well suited to red clover and are poorly suited to alfalfa. Although in some years it is hard to get a good stand of a winter cover crop, corn can be grown year after year if winter legumes, vetch, rye and vetch, or crimson clover are planted in fall and turned under in spring.

In places, hedges, levees, or diversion ditches are needed to protect the soils from overflow and from runoff from higher soils. In some places open ditches are needed to provide drainage, and on some areas of the Lobelville

TABLE 6.—Soils of management group 1: Estimated average acre yields of principal crops under two levels of management

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

Soil	Corn		Lespedeza		Soybeans		Pasture	
	A	B	A	B	A	B	A	B
	Bu.	Bu.	Tons	Tons	Bu.	Bu.	Cow-acre-days ¹	Cow-acre-days ¹
Ennis silt loam.....	44	70	1.1	1.6	24	30	115	150
Ennis cherty silt loam.....	33	50	.9	1.4	16	25	80	125
Lobelville silt loam.....	38	55	.7	1.3	18	25	100	140
Lobelville cherty silt loam.....	28	42	.6	1.2	15	20	70	115

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

soils, tile drains can be used. The soils of this group are suited to irrigation, and many areas occur along the larger creeks where water can be obtained easily.

Lime and phosphate will benefit pastures and all crops, particularly the legumes, and are necessary to establish and maintain a stand of red clover. Nitrogen is needed to maintain high yields of corn, especially if corn is grown every year. Potash is needed for some crops. On areas that do not receive silt from stream overflow, crop residues turned under, green manure, or barnyard manure is required to maintain organic matter.

A corn-hay rotation is desirable on these soils. Corn can be rotated with clover. On most farms a good rotation is corn and soybeans. If a slightly longer rotation is needed, the soybeans can be followed by red clover and grass. A rotation of corn or sorghum, wheat, and crimson clover is suitable on the soils that have the least risk of flooding. Small grains can be grown along streams that overflow for only short periods.

These soils are seldom used for pasture because they are so well suited to intensive cropping. In dry summers, however, some areas can be used for emergency grazing if they are seeded to millet, sudangrass, or common lespedeza, and fertilizer is applied. If the soils are pastured, grazing must be controlled and the areas mowed to control weeds and encroaching bushes. The soils are suited to irrigated pasture.

Management Group 2

These well drained to somewhat poorly drained soils are listed in table 7. They occur on the mild slopes of stream terraces and on bottom lands. The soils are medium acid to strongly acid. They occupy 8.9 percent of the land area of the county. These soils are desirable for growing crops and pasture.

Use and management.—Most of these soils are used intensively to grow corn, cotton, soybeans, small grains, common lespedeza, vetch, and crimson clover. Alfalfa is grown on some of the soils, and a small part is used for pasture. Some of the soils are used for truck crops and farm gardens. Except for the Humphreys soils, they



Figure 6.—Corn on Lobelville silt loam, local alluvium phase, in foreground. The soil in the background is Bodine cherty silt loam, severely eroded sloping phase.

generally occur in small areas and are used along with adjacent soils. Some fields are laid out without regard to suitability of other soils (fig. 6). Many areas of the Greendale soils are hard to reach and have not been cleared. Some of the soils are shaded by trees.

These soils are seldom flooded. They have a wider use than the soils of management group 1 but are especially well suited to hay and pasture. They are mostly easy to work, but chert in the Greendale and Humphreys cherty silt loams hinders tillage to some extent. The soils can be tilled throughout a wide range of moisture content without injury, and crops make good yields.

These soils are well suited to summer pasture and to corn, cotton, tobacco, soybeans, and common lespedeza. They are also suited to red, white, and Ladino clovers, sudangrass, millet, orchardgrass, and vegetable crops. Except on Greendale cherty silt loam and on the Lobelville soil, alfalfa can be grown under good management that includes the use of adequate fertilizer. If alfalfa and strawberries are to grow well on any of these soils, drainage must be improved. Small grains and cotton require balanced nutrients. In some years small grains lodge.

Good yields can be obtained on these soils under almost

TABLE 7.—Soils of management group 2: Estimated average acre yields of principal crops under two levels of management [Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management. Dashes indicate soil is poorly suited to the crop]

Soil	Corn		Cotton (lint)		Wheat		Oats		Lespedeza		Alfalfa		Soybeans		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	Bu.	Lb.	Lb.	Bu.	Bu.	Bu.	Bu.	Tons	Tons	Tons	Tons	Bu.	Bu.	Lb.	Lb.	Cow- acre- days ¹	Cow- acre- days ¹
Emory silt loam.....	45	75	450	650	18	25	40	65	1.2	1.8	2.5	3.5	25	32	1,700	2,200	120	165
Greendale cherty silt loam..	32	50	280	350	10	17	20	40	.9	1.4	1.8	2.6	17	24	1,400	1,700	80	125
Greendale silt loam.....	43	70	400	600	14	21	35	55	1.0	1.6	2.2	3.0	22	28	1,600	1,950	110	150
Humphreys silt loam.....	43	65	370	450	13	20	32	55	1.1	1.6	2.2	3.2	19	26	1,700	2,100	105	145
Humphreys cherty silt loam.....	27	46	250	350	11	18	20	38	.9	1.4	1.9	2.7	16	24	1,300	1,600	70	120
Lobelville silt loam, local alluvium phase.....	40	60	340	450	13	16	-----	-----	.9	1.5	-----	-----	20	27	1,400	1,800	100	140

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

continuous row crops, but a short rotation is desirable on most farms. Suitable cropping systems are (1) 1 year each of corn, wheat, and either red or crimson clover; (2) 1 year each of corn red clover, or common lespedeza; (3) 1 year each of soybeans, wheat, common lespedeza, and barley and crimson clover; (4) corn with vetch and rye turned under; (5) grain sorghum, oats, and crimson clover or vetch; (6) 1 year each of tobacco and crimson clover or vetch.

In rotation (1) cotton or potatoes can be substituted for the corn and oats or barley for the wheat. Alfalfa can be substituted for the red clover in some areas, but this would require a longer rotation. Rotations (4) and (5) can be used on farms where it is necessary to grow row crops almost continuously. In rotation (4) cotton, potatoes, or any vegetable crop can be substituted for the corn.

Diversion of the runoff from higher areas is needed in some places. In many places the Emory and Lobelville soils would be improved by surface drainage. Tillage on the contour is needed on the longer, gentle slopes. Natural waterways are best left in sod.

These soils have a better supply of plant nutrients than most of the soils in the county, but crops respond well to soil amendments. Lime will benefit all crops and, in most places, lime will be needed to establish and maintain a stand of red clover and alfalfa. Nitrogen is generally required for crops other than legumes, particularly corn, even though legumes are included in the rotation. Phosphate must be used for high yields of most crops, and some crops need potash. If these soils are used intensively for row crops, crop residues turned under, green manure, or barnyard manure will be required to maintain the supply of organic matter.

These soils are generally moist. They make good yields of most crops, even in hot, dry seasons. They are

therefore desirable for summer pasture. A good mixture for seeding the pastures is orchardgrass and white and Ladino clovers. On some farms the Lobelville soil and Greendale cherty silt loam can be seeded to sudangrass, millet, or common lespedeza, although these soils are better suited to fescue and clover. Grazing must be controlled and the areas mowed. Lime and fertilizer are needed.

Management Group 3

The soils of this group are listed in table 8. They are well drained and have a moderate to high water-supplying capacity. The soils are medium acid to very strongly acid. The supply of plant nutrients is moderate but varies, depending on the past cropping system and the degree of erosion. Most of the soils are moderately permeable and have a moderate risk of erosion. They occupy about 4.3 percent of the county.

Use and management.—Most of these soils are used for crops and pasture, and only about 5 percent is uncleared. The principal crops are corn, cotton, wheat, oats, barley, rye, vetch, soybeans, crimson clover, common lespedeza, and alfalfa. Some tobacco is grown, mainly on the Etowah and Pembroke soils. Strawberries are grown on many farms, and some red clover is grown. On many farms the use of these soils depends upon other soils. Generally, these soils are good for crops and pasture.

Most of the soils are easy to work, and good tilth is easy to maintain. Much of the time, however, Decatur silty clay loam, severely eroded gently sloping phase, is too wet or too dry to be worked, and more power is required for tillage than is needed for the other soils.

The soils are well suited to tree fruits and to corn, cotton, tobacco, strawberries, crimson clover, small grains, soybeans, and vetch. They are also suited to pasture

TABLE 8.—Soils of management group 3: Estimated average acre yields of principal crops under two levels of management [Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management]

Soil	Corn		Cotton (lint)		Wheat		Oats		Lespedeza		Alfalfa		Soybeans		Tobacco		Pasture		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Bewleyville silt loam:																			
Eroded gently sloping shallow phase.....	Bu. 37	Bu. 51	Lb. 360	Lb. 525	Bu. 15	Bu. 20	Bu. 31	Bu. 51	Tons 0.8	Tons 1.3	Tons 2.0	Tons 3.0	Bu. 16	Bu. 21	Lb. 1,425	Lb. 1,700	Cow-acre-days ¹ 90	Cow-acre-days ¹ 140	
Gently sloping shallow phase.....	41	60	395	575	17	22	34	56	.9	1.5	2.2	3.2	18	24	1,600	1,900	100	145	
Cookeville silt loam:																			
Gently sloping phase.....	37	52	385	525	16	21	32	52	.8	1.4	2.1	3.0	16	23	1,475	1,800	90	130	
Eroded gently sloping phase.....	33	46	350	500	14	19	30	50	.7	1.2	1.9	2.8	14	18	1,350	1,600	80	125	
Decatur silt loam, eroded gently sloping phase.....	39	60	385	575	18	24	36	60	1.0	1.5	2.7	3.5	22	27	1,500	1,900	100	145	
Decatur silty clay loam, severely eroded gently sloping phase.....	30	55	375	575	15	24	32	52	.9	1.5	2.5	3.5	15	25	1,325	1,650	90	145	
Etowah silt loam, eroded gently sloping phase.....	38	55	375	550	16	22	34	56	1.0	1.4	2.4	3.2	17	21	1,500	1,900	95	140	
Pembroke silt loam:																			
Eroded gently sloping phase.....	40	62	405	600	18	24	36	60	1.0	1.5	2.7	3.5	22	27	1,500	1,900	100	145	
Level phase.....	44	72	450	650	20	26	40	65	1.2	1.8	3.0	3.8	24	32	1,700	2,100	120	165	

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

plants, as tall fescue, orchardgrass, button, Ladino, and white clovers, common lespedeza, millet, and sudangrass. If lime and fertilizer are applied, alfalfa and red clover grow well.

Under good management these soils can be used intensively for crops and erosion losses kept at a minimum. A good rotation is one in which a row crop is grown every other year, or every third year. On smoother areas, where the soils are less easily eroded, a 2- or 3-year rotation, as a row crop followed by a small grain and then by a winter legume turned under, is suited. Areas that are more eroded will need longer rotations.

Suitable rotations for these soils are (1) 1 year each of corn or cotton and a small grain and 2 to 4 years of red clover, alfalfa, or common lespedeza; (2) 1 year each of corn (vetch), cotton, wheat, and red clover and grass; (3) 2 years of corn (vetch), 1 year of a small grain, and 4 years of alfalfa; (4) 1 year each of grain sorghum and oats and crimson clover; (5) 1 year each of grain sorghum or cotton and button clover; and (6) 1 year each of soybeans, wheat with common lespedeza, and crimson clover and barley.

In the first rotation orchardgrass can be added to the red clover or alfalfa if desired, and a truck crop or tobacco can be substituted for the corn. If a less depleting rotation than that shown in (2) is desired, vetch can be substituted for the corn. The third rotation is suitable for use on dairy farms. If the dairy farmer desires a less depleting rotation, he can grow vetch instead of the first year of corn.

Contour tillage is desirable in most areas, and on some of the longer slopes, terraces are needed. Natural waterways are best left in sod. The severely eroded phases of the Decatur silty clay loams will need careful management to prevent further erosion and to maintain good tilth.

Lime and phosphate will benefit all crops, particularly legumes such as common lespedeza, and they are necessary to establish and maintain alfalfa and red clover. Nitrogen is needed to maintain high yields of all crops. Less nitrogen fertilizer is required for crops that follow legumes. Potash is needed for cotton, tobacco, and legumes and for some crops that follow a high-yielding hay crop.

Although the soils are well suited to pasture, applications of lime and fertilizer are needed to maintain and produce high yields. If the soils are pastured, grazing must be controlled and the areas mowed to control weeds.

Management Group 4

These well-drained soils are listed in table 9. They occupy gently sloping and sloping areas. Generally, runoff is rapid, and the water-supplying capacity is low. Some of the soils occur at the bases of steeper slopes and receive runoff water from the higher areas. In some places there are shallow gullies. The soils of this group occupy 3.4 percent of the county. They are moderately good for crops and pasture.

Use and management.—Most areas of these soils are used for crops and pasture. Only a small part is in forest. The chief crops are corn, cotton, soybeans, small grains, common lespedeza, alfalfa, and vetch. Cotton is the chief cash crop, although some tobacco and strawberries are grown. There are some permanent pastures and some rotation pastures that are seeded mainly to

common lespedeza. On many farms these soils are used along with soils of management groups 2 and 3 without regard to soil differences.

The soils of this group cannot be used so intensively as those of management group 3 for row crops or for close-growing crops that require annual seedbed preparation. Although the uneroded areas are easy to work, there are eroded areas that are harder to work. Under good management these soils are suited to corn, cotton, tobacco, small grains, alfalfa, red and crimson clovers, Ladino and other white clovers, orchardgrass, tall fescue, common lespedeza, and sericea lespedeza. Except on the severely eroded soils, yields are moderate.

A rotation in which row crops are grown only once in 3 to 6 years can be used on these soils and erosion kept to a minimum. Fertilizer must be used, however, and other good management must be practiced. On the severely eroded areas, it is advisable to keep the soil in close-growing crops instead of row crops until runoff has been controlled and the content of organic matter has been increased. A cover crop should always follow a tilled crop, and a grass-legume mixture needs to be grown periodically to help to maintain the supply of organic matter in the soil. If a sod crop is not included in the cropping system, a green-manure crop should be grown. The soils that have short slopes can be used in a shorter rotation than the soils on longer slopes, but generally they are too cherty for intensive use for crops.

Good rotations for these soils are (1) 1 year of corn followed by a small grain seeded with vetch and then 4 years of alfalfa; (2) 1 year each of corn or cotton, wheat, and red clover seeded with orchardgrass. If the soils are properly fertilized and excess water is controlled, practically all of the rotations suggested for the soils of group 3 can be used and erosion kept to a minimum.

It is best to plow these soils in spring. Tillage on the contour is required, where feasible, and on the longer slopes stripcropping is needed. Natural drainageways are best left in sod. Terracing is desirable in many places, particularly where row crops are grown frequently. In places gullies can be filled in by bulldozer.

Tillage is difficult on the severely eroded areas because the soil is usually either too wet or too dry. It is easy to maintain good tilth on the uneroded soils. The growing of sod crops, deep-rooted legumes, and green-manure crops will help to improve tilth.

Lime and phosphate are needed for all crops and pastures, and particularly for legumes and grasses. Nitrogen is required except where it is supplied by legumes. Potash is needed for cotton, tobacco, and alfalfa, and for other crops. The amount needed depends upon past cropping practices. Green-manure crops and barnyard manure are needed to maintain organic matter. Soils that are used for tobacco especially need applications of barnyard manure.

Pastures are somewhat hard to establish, especially on the more eroded areas. Here, barnyard manure, where available, or nitrogen fertilizer is needed. Legumes are necessary to maintain high yields. A good pasture mixture is orchardgrass and Ladino clover or white clover. If less fertilizer is available, redbud and common lespedeza can be used to establish and maintain pastures. When these soils are used for pasture, it is necessary to control grazing, and the areas need to be mowed to control growth of weeds.

TABLE 9.—Soils of management group 4: Estimated average acre yields of principal crops under two levels of management [Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management. Dashes indicate soil is poorly suited to crops]

Soil	Corn		Cotton (lint)		Wheat		Oats		Lespedeza		Alfalfa		Soybeans		Tobacco		Pasture		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Baxter cherty silt loam:																			
Eroded gently sloping phase.....	Bu. 22	Bu. 38	Lb. 260	Lb. 375	Bu. 11	Bu. 16	Bu. 18	Bu. 35	Tons 0.5	Tons 1.1	Tons 1.7	Tons 2.4	Bu. 9	Bu. 12	Lb. 625	Lb. 1,000		Cow-acre-days ¹ 55	Cow-acre-days ¹ 105
Sloping phase.....	22	38	260	375	11	16	18	35	.5	1.1	1.7	2.4	9	12	625	1,000		55	105
Eroded sloping phase.....	20	34	235	325	9	14	16	32	.4	1.0	1.5	2.2	8	10	550	900		50	95
Baxter cherty silty clay loam, severely eroded sloping phase.....		20		225		10		21	.3	.7								25	60
Cookeville silt loam:																			
Sloping phase.....	33	46	350	500	14	19	30	50	.7	1.2	1.9	2.8	14	18	1,350	1,600		80	125
Eroded sloping phase.....	30	40	310	450	13	17	27	45	.6	1.1	1.7	2.4	13	16	1,200	1,450		70	110
Cookeville silty clay loam, severely eroded sloping phase.....		27		300		11	16	31	.4	.8		1.7						30	75
Decatur silt loam, eroded sloping phase.....	35	55	345	525	16	22	32	54	.9	1.4	2.3	3.3	19	24	1,350	1,700		90	135
Decatur silty clay loam, severely eroded sloping phase.....		35		350		15		30	.4	1.0		2.1						40	95
Etowah silt loam, eroded sloping phase.....	32	50	335	500	14	20	31	51	.9	1.2	2.0	2.8	15	19	1,350	1,700		85	125
Etowah silty clay loam, severely eroded sloping phase.....		32		335		13	17	34	.4	.8		1.8						35	85
Minvale cherty silt loam:																			
Eroded gently sloping phase.....	25	45	335	500	13	19	20	38	.7	1.2	1.8	2.8	12	18	1,150	1,525		75	125
Sloping phase.....	25	45	335	500	13	19	20	38	.7	1.2	1.8	2.8	12	18	1,150	1,525		75	125
Eroded sloping phase.....	22	40	300	450	11	17	18	35	.6	1.1	1.6	2.4	10	15	1,000	1,375		65	105
Minvale cherty silty clay loam, severely eroded sloping phase.....		22		260		10		22	.3	.7		1.6						25	65

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

Management Group 5

The soils of this group are shown in table 10. They are level to gently sloping silt loams, and some are eroded. Surface runoff is slow to medium, and internal drainage is slow to rapid. The soils are strongly acid to very strongly acid. The Captina and Dickson soils have fragipans, and the Mountview soils are underlain by cherty materials. The soils of this group occupy 21.5 percent of the county. They are fair to good for crops and pasture.

Use and management.—About 35 percent of the acreage is in forest, and some is cleared each year. About 50 percent of the cleared part is used for corn and cotton. The rest is used mainly for pasture, small grains, vetch, and annual hay and seed crops. Although cotton is the main cash crop, some strawberries, tobacco, and okra are grown.

None of these soils are cherty enough to hinder tillage, but the Captina and Dickson soils are sometimes too wet to till. As most of the soils are somewhat erodible and droughty, they are best suited to crops that do not require a large supply of moisture. In unusually moist, cool seasons, some other crops will grow.

The soils are better suited to cotton than to corn and are fairly well suited to wheat, rye, oats, barley, soybeans,

grain sorghum, common and sericea lespedeza, vetch, strawberries, and some vegetables. If heavily fertilized, orchardgrass, tall fescue, and red, white, and Ladino clovers can be grown.

These soils are not well suited to tree fruits, and the water-supplying capacity is too low for sweetpotatoes to grow well in most years. None of the soils are well suited to alfalfa. Although alfalfa can be established if it is heavily limed and fertilized, the stand is hard to maintain. The Mountview soils are better suited to tobacco than the other soils of this group.

A row crop can be grown on these soils as much as 50 percent of the time. It is best not to grow a row crop more than 2 years in succession, however, and a cover crop should follow the row crop. Suitable rotations for these soils are (1) 1 year of corn and 2 years of small grains and common lespedeza; (2) 1 year each of corn, wheat, and red clover and grass; (3) 1 year each of corn, cotton, rye and vetch, and vetch; (4) 1 year each of grain sorghum, oats with common lespedeza, and crimson clover; (5) 1 year each of soybeans, wheat with common lespedeza, and crimson clover; (6) 1 year of corn, 1 year of wheat, and 3 years of sericea lespedeza; and (7) 1 year of cotton with vetch and rye, and 1 year of vetch.

In rotation (1) cotton, tobacco, or potatoes can be

TABLE 10.—*Soils of management group 5: Estimated average acre yields of principal crops under two levels of management*
 [Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management.
 Dashes indicate soil is poorly suited to the crop]

Soil	Corn		Cotton (lint)		Wheat		Oats		Lespedeza		Alfalfa		Soybeans		Tobacco		Pasture		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Captina silt loam:																			
Eroded gently sloping phase.....	Bu. 26	Bu. 44	Lb. 310	Lb. 450	Bu. 12	Bu. 17	Bu. 19	Bu. 38	Tons 0.7	Tons 1.2	Tons	Tons	Bu. 13	Bu. 18	Lb. 850	Lb. 1,300	Cow-acre-days ¹ 55	Cow-acre-days ¹ 105	
Gently sloping phase.....	29	48	330	475	13	19	22	43	.8	1.4	-----	-----	15	21	975	1,450	60	115	
Dickson silt loam:																			
Gently sloping phase.....	28	46	325	450	12	18	20	40	.7	1.3	-----	-----	14	20	900	1,400	60	110	
Eroded gently sloping phase.....	25	42	295	425	11	17	19	38	.6	1.2	-----	-----	12	18	800	1,250	55	100	
Eroded gently sloping dark brown surface phase.....	27	46	315	475	12	18	20	40	.7	1.2	-----	-----	13	19	850	1,300	60	115	
Level dark brown surface phase.....	30	50	350	500	14	20	21	42	.9	1.5	-----	-----	15	22	850	1,300	65	120	
Mountview silt loam:																			
Gently sloping phase.....	32	52	365	525	14	20	24	46	.8	1.4	1.9	2.8	16	22	1,400	1,700	65	120	
Eroded gently sloping phase.....	30	48	335	500	13	18	22	44	.7	1.2	1.7	2.6	14	19	1,250	1,525	65	115	
Gently sloping shallow phase.....	26	42	300	425	11	17	19	38	.6	1.2	1.7	2.5	12	18	1,250	1,600	60	110	
Eroded gently sloping shallow phase.....	24	38	285	400	10	16	18	36	.5	1.1	1.5	2.2	10	16	1,125	1,450	55	100	
Pace silt loam, eroded gently sloping phase.....	25	44	305	450	11	17	19	38	.6	1.2	-----	-----	12	18	800	1,250	50	105	

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

substituted for the corn. If a less depleting rotation is desired than shown in rotation (3), vetch can be substituted for the corn. Barley and crimson clover, or rye and vetch can be grown continuously on these soils. To make best use of available moisture, it is better to seed the droughty soils to small grains in fall than to corn. The small grains can be used for grazing.

It is desirable to till on the contour wherever feasible. On the longer slopes terracing or other practices are needed to control runoff. Natural drainageways are best left in sod.

Lime, phosphate, potash, and nitrogen are required for high yields of most crops. Potash is needed particularly for cotton and legumes. Legume crops, well inoculated and turned under when green, will supply enough nitrogen for moderate yields of the crop that follows. For best yields, however, corn, truck crops, and tobacco require a complete fertilizer. Corn, cotton, and small grains will benefit by nitrogen used as a side dressing. All cover crops need a complete fertilizer.

These soils are suited to pasture, but lime and a complete fertilizer must be used at the time the pasture is seeded, and maintenance applications must be added annually. Where grazing is controlled and adequate fertilizer is added, pastures need only an occasional mowing to control weeds.

Management Group 6

The soils of this management group are listed in table 11. They are on steeper slopes, are shallower in depth to the underlying cherty material, and are more droughty

than the soils of group 5. The surface runoff is rapid, internal drainage is medium to rapid, and the water-holding capacity is moderate to low. The soils are strongly acid to very strongly acid and generally have a low content of organic matter. They occupy about 5.5 percent of the county.

Use and management.—About 35 percent of the acreage is in trees, and a few areas have been reforested by planting shortleaf pines. About 15 percent of the cleared part is idle, and the rest is used for pastures and crops, about half of which are row crops. Cotton is the main cash crop, but some tobacco and strawberries are grown. Little alfalfa is grown because it is difficult to maintain a stand, but a fairly large acreage is used for wheat. Soybeans are grown for hay and seed, and rye and vetch are grown together for winter cover, green manure, and seed. Some of the acreage is in barley and crimson clover. Some buckwheat is grown.

These soils are fairly easy to work, but the risk of erosion limits tillage. The soils are suited to pasture and to such crops as corn, cotton, soybeans, small grains, sericea lespedeza, tobacco, and vegetable crops. They are better suited, however, to small grains or cotton than to corn or soybeans. Orchardgrass and tall fescue and red, Ladino, and white clovers can be grown if well fertilized. It is difficult to maintain a stand of alfalfa on these soils.

These soils require a longer rotation than the soils of group 5, and the rotation should include more close-growing crops. Row crops can be grown as much as 35 percent of the time but should not be grown 2 years in succession. Suitable rotations are (1) 1 year of corn, 2 years of small grain and common lespedeza, and then

TABLE 11.—Soils of management group 6: Estimated average acre yields of principal crops under two levels of management [Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management. Dashes indicate soil is poorly suited to the crop]

Soil	Corn		Cotton (lint)		Wheat		Oats		Lespedeza		Alfalfa		Soybeans		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Captina silt loam, eroded sloping phase.....	Bu. 20	Bu. 35	Lb. 275	Lb. 400	Bu. 10	Bu. 15	Bu. 15	Bu. 32	Tons 0.5	Tons 0.9	-----	-----	Bu. 10	Bu. 14	Lb. 700	Lb. 1,050	Cow-acre-days ¹ 45	Cow-acre-days ¹ 85
Mountview silt loam: Sloping shallow phase.....	23	38	285	400	10	16	18	36	.5	1.1	-----	2.2	10	16	1,125	1,450	55	100
Eroded sloping shallow phase.....	20	38	250	400	9	16	16	32	.4	1.0	-----	-----	9	16	900	1,300	50	90
Pace silt loam, eroded sloping phase.....	22	38	275	360	9	15	17	34	.5	1.1	-----	2.2	10	16	700	1,125	45	95

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

crimson clover; or (2) 1 year of corn and 3 years of small grain and common lespedeza followed by crimson clover. Almost any of the other row crops can be grown instead of corn in these rotations.

It is important to follow all row crops with vetch, rye and vetch, or some other cover crop. Some of the soils are best used for small grains and winter legumes each year. If row crops are grown, they should be planted early in spring.

Good tillth is easy to maintain, and tillage can be carried on throughout a fairly wide range of moisture content. It is necessary to till on the contour; otherwise the soils will continue to erode. On the longer slopes, stripcropping is needed. Natural drainageways are best left in sod. The soils have smooth slopes and terraces can be used. Therefore, where suitable outlets are available, runoff can be controlled by terracing or by use of diversion ditches.

Lime, phosphate, potash, and nitrogen are required for high yields of most crops. Corn requires a side dressing of nitrogen for the best yields, and small grains need a top dressing of nitrogen. Cover crops, in particular, need a complete fertilizer.

The soils are suited to pasture but need lime and phosphate. Also, moderate applications of nitrogen and potash will be needed to establish the stand of pasture plants. Grazing must be controlled and the areas mowed occasionally to control weeds. A good pasture mixture is white or Ladino clover and orchardgrass.

Management Group 7

The soils of this group are shown in table 12. Most of them occupy slopes of 5 to 12 percent, but some are on slopes of 2 to 5 percent. Surface runoff is medium to rapid. Internal drainage is rapid, except in the Pace soils, and these have medium to slow internal drainage. The soils have a low water-holding capacity and a low content of plant nutrients and organic matter. They are strongly acid to very strongly acid. These soils occupy about 12.5 percent of the county. They are poor to fair for crops and pasture.

Use and management.—In many places these soils occur on narrow, winding ridges that are not easy of

access and near soils not suited to agriculture. About 35 percent of the acreage is under forest and is best used for that purpose. About 25 percent of the cleared part is idle or abandoned, and in some places bushes are encroaching.

On many farms these soils make up the major part of the cropland and must be used to grow feed and cash crops. On these, corn, cotton, common lespedeza, and rye and vetch can be grown with fair success if good management is used. Cotton is the principal cash crop, but some tobacco and strawberries are grown. There are some improved pastures.

The use of these soils is limited in many places by their location, by the low water-holding capacity, and by the chert that hinders tillage and prevents the use of heavy farm machinery. Many cleared areas that are not easy of access should be reforested, and some plantings of shortleaf pine have already been made. Some areas, especially those that are small and associated with steeper soils, are best used for pasture. Removal of the large chert fragments would widen the use of these soils, but the expense would be justified only on small fields that are to be used for intensive cash crops.

These soils are best suited to crops that require little moisture or that grow in moist seasons, as, for example, fall-seeded crops and pasture. Good management is needed for even fair yields. Corn, cotton, small grains, vetch, common and sericea lespedeza, redbud, orchardgrass, tall fescue, and white and Ladino clovers can be grown if good management is practiced. The soils are not well suited to red clover, but it can be grown if adequate fertilizer is applied.

Although these soils can be used for row crops up to a third of the time, a row crop should not be grown 2 years in succession. The following are suitable rotations: (1) 1 year each of corn, wheat, and red clover and orchardgrass; (2) 1 year each of common lespedeza and small grain; (3) 1 year each of corn or cotton, common lespedeza, small grain, and common lespedeza; and (4) 1 year of corn and 3 or 4 years of sericea lespedeza. If a less depleting rotation than that shown in (3) is desired, wheat or rye can be substituted for the corn or cotton, and, if the operator desires, vetch or crimson clover can

TABLE 12.—*Soils of management group 7: Estimated average acre yields of principal crops under two levels of management*
 [Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management.
 Dashes indicate soil is poorly suited to the crop]

Soil	Corn		Cotton (lint)		Wheat		Oats		Lespedeza		Alfalfa		Soybeans		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Baxter cherty silt loam; Sloping light colored phase	Bu. 20	Bu. 32	Lb. 245	Lb. 335	Bu. 8	Bu. 14	Bu. 15	Bu. 32	Tons 0.4	Tons 0.9	Tons	Tons 2.0	Bu. 10	Bu. 10	Lb. 600	Lb. 900	Cow- acre- days ¹ 45	Cow- acre- days ¹ 85
Eroded sloping light colored phase	18	29	220	300	7	12	---	29	.3	.8	---	1.8	---	10	---	800	40	75
Gently sloping light colored phase	23	35	275	360	9	15	17	36	.5	1.0	---	2.2	---	12	650	1,000	50	95
Eroded gently sloping light colored phase	20	32	245	335	8	14	15	32	.4	.9	---	2.0	---	10	600	900	45	85
Bodine cherty silt loam: Sloping phase	19	28	205	275	7	12	---	25	.3	.8	---	---	---	---	500	800	30	55
Eroded sloping phase	17	25	185	250	---	10	---	20	.3	.7	---	---	---	---	---	725	25	50
Gently sloping phase	21	30	225	300	8	13	15	30	.4	.8	---	---	---	---	575	900	30	60
Eroded gently sloping phase	19	28	205	275	7	12	---	25	.3	.8	---	---	---	---	500	800	30	55
Bodine fine cherty silt loam: Eroded gently sloping phase	20	32	240	325	8	13	15	32	.4	.9	---	---	---	---	600	900	45	70
Eroded sloping phase	18	28	215	290	7	11	---	28	.3	.8	---	---	---	---	---	800	40	60
Pace cherty silt loam: Eroded sloping phase	20	36	200	275	6	12	---	24	.3	.9	---	---	---	---	500	775	40	80
Sloping phase	22	38	220	300	7	14	15	32	.4	1.1	---	2.2	9	14	525	850	45	100
Eroded gently sloping phase	22	38	220	300	7	14	15	32	.4	1.1	---	2.2	9	14	525	850	45	100

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

be grown following the small grain. If the operator wishes a less depleting rotation than that given in (4), wheat can be grown instead of corn.

These soils are cherty and droughty, so further loss of soil would be serious. Tillage on the contour is desirable to reduce erosion. Natural drainageways are best left in sod. The soils are not so erodible as the soils of management group 6, and terraces are generally not needed. If terraces are required, however, they can be maintained easily because the soils are permeable.

Most crops and pasture on these soils need lime and a complete fertilizer. They need lime, in particular, to establish and maintain legumes, as red and Ladino clovers. A legume will supply much of the nitrogen needed for the crop following it in the rotation, but additional nitrogen is needed for the best yields of corn and other grain crops. Potash is needed for cotton, tobacco, legumes, and other crops that follow a high-yielding hay crop. Vetch and similar cover crops require a fertilizer low in nitrogen, and basic slag or superphosphate can be used. On areas that have not been limed, 400 to 600 pounds per acre of basic slag, or its equivalent, can be used for vetch and common lespedeza.

Fair pastures can be established and maintained under good management. Grazing must be controlled, particularly in dry seasons, to avoid injury to the stand. Although mowing is desirable for control of weeds, in some areas mowing will be hindered by the chert.

Management Group 8

The soils of this group are shown in table 13. They are level to gently sloping, and most of them are somewhat poorly drained. Surface runoff is mostly slow to very slow. Internal drainage is predominantly slow to very slow, and the water-holding capacity is low. The soils are medium acid to extremely acid and are low in available phosphorus. All have pans. The soils occupy 1.5 percent of the county. They are poor to fair for crops and pasture.

Use and management.—About 35 percent of the acreage is in forest, and about 20 percent of the cleared part is idle. Many areas of Lawrence and Taft silt loams occur in small, narrow areas and are used along with the adjoining soils. On some farms the soils of this group are used mainly for pasture, soybeans, lespedeza hay, and rye and vetch. On other farms these soils, particularly the Sango, predominate and are used more intensively for crops. The main crops are corn, cotton, small grains, soybeans, sorghum, vetch, and common lespedeza, but some tobacco is grown. Crop failures are common.

These soils are easy to work, but tillage is delayed in spring as the soils are too wet for the use of machinery. The level areas that are not eroded easily and that are to be planted in spring can be plowed in fall or winter and left without cover.

These soils are better suited to pasture than to crops, but yields are low. If the soils are drained and well man-

TABLE 13.—*Soils of management group 8: Estimated average acre yields of principal crops under two levels of management*
 [Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management.
 Dashes indicate soil is poorly suited to the crop]

Soil	Corn		Cotton (lint)		Wheat		Oats		Lespedeza		Soybeans		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Lawrence silt loam.....	Bu. 15	Bu. 36	Lb. 185	Lb. 250	Bu. 12	Bu. 12	Bu. 28	Bu. 28	Tons 0.4	Tons 1.0	Bu. 10	Bu. 16	Lb. ---	Lb. ---	Cow-acre-days ¹ 45	Cow-acre-days ¹ 75
Brown variant.....	26	44	280	400	---	16	---	42	.9	1.5	21	28	---	---	95	145
Sango silt loam:																
Gently sloping phase.....	22	40	260	325	9	16	---	33	.5	1.2	13	19	700	1, 100	55	100
Eroded gently sloping phase.....	20	36	235	300	8	15	---	32	.5	1.1	11	18	625	1, 000	50	90
Level phase.....	22	40	235	300	8	13	---	31	.5	1.1	13	18	625	1, 000	50	90
Taft silt loam.....	20	38	225	300	---	15	---	30	.5	1.0	12	18	---	---	55	95

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

aged, cotton, tobacco, wheat, oats, rye, vetch, and redtop can be grown. The soils are not suited to strawberries and truck crops.

When the soils are drained some suitable rotations are (1) 1 year each of grain sorghum and a small grain and 3 years of sericea lespedeza; (2) 1 year each of cotton or wheat, common lespedeza, small grain, common lespedeza, and crimson clover; (3) 1 year each of soybeans and rye with vetch; and (4) 1 year each of grain sorghum and oats with crimson clover or vetch. Careful management is necessary to grow row crops as often as every other year.

Although the soils are fairly well suited to pasture, they are too droughty to sustain grazing during dry spells in summer and fall. In wet seasons trampling injures plants and can start erosion. Overgrazing in dry periods weakens desirable plants and encourages the growth of weeds. The areas need periodic mowing to help control weeds.

In most places these soils can be improved by use of open bedding ditches or diversion ditches. Because of the pan layer, tile drainage is not feasible. Attempts to break up the pan are not practical, for even though it is broken up by subsoiling, it forms again.

Lime and a complete fertilizer are needed for all pasture and crops. Lime is particularly needed for most legumes. In a 10-year experiment the response to liming was found to be very striking, but it varied greatly with the crops (5).

If inoculated, legumes and legume-grass mixtures for hay and pasture do not need nitrogen, but they do need phosphate and potash. Cover crops or rye and vetch will benefit from applications of about 200 pounds per acre of superphosphate. Heavier applications of basic slag can be substituted.

Management Group 9

These poorly drained soils are listed in table 14. They are predominantly gray in color and occupy level areas and depressions. They are strongly acid to extremely acid. The Guthrie and Robertsville soils have pans, and they have a low water-holding capacity. The Lee soil does not have a pan, and its water-holding capacity is high. The soils occupy 3.5 percent of the county.

Use and management.—Most of these soils are covered by hardwood forests, some of which are pastured. The cleared areas are used chiefly for pastures that are mainly unimproved. A small part is used for crops, as corn, sorghum, soybeans, and common lespedeza. Some redtop is grown with lespedeza, and some rye or rye and vetch is grown.

The use of these soils is limited by poor drainage. The soils are easy to work but are generally too wet for tillage. Most areas are best left in trees because the cost of clearing

TABLE 14.—*Soils of management group 9: Estimated average acre yields of principal crops under two levels of management*
 [Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management.
 Dashes indicate soil is poorly suited to the crop]

Soil	Corn		Lespedeza		Soybeans		Pasture	
	A	B	A	B	A	B	A	B
Guthrie silt loam.....	Bu. 18	Bu. 23	Tons 0.3	Tons 0.8	Bu. 7	Bu. 12	Cow-acre-days ¹ 50	Cow-acre-days ¹ 65
Guthrie silt loam, overwash phase.....	18	37	.5	1.1	11	17	50	110
Lee silt loam.....	16	30	.5	1.0	9	15	40	100
Robertsville silt loam.....	---	25	.4	1.1	8	14	35	75

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

and reclaiming is too high to pay for potential use. The soils are fair to good for pasture but are poorly suited to crops. The Lee soil, however, is better suited to crops than other soils of the group. If the soils are cultivated, crops should be used that can be planted late in spring or early in summer and harvested in fall. When the soils are drained, soybeans, sorghum, common and sericea lespedeza, tall fescue, redbud, and whiteclover can be grown. In some areas rye or rye and vetch can be grown.

Drainage would improve these soils. In many places diversion ditches and open bedding ditches can be used, although drainage may not be feasible on the Guthrie and Robertsville soils because of the hardpan and lack of good outlets. Many areas of these soils are 75 to 100 acres in size and involve more than 1 farm. In some places distance from a natural drainageway is an important factor, and several farmers may need to cooperate in providing drainage. Tile drainage can be used on the Lee soil.

Lime and phosphate are required for all crops and pasture, and potash, in particular, is needed. Areas that are pastured also need to be mowed to control weeds, and grazing must be controlled carefully.

Management Group 10

The soils of this group are shown in table 15. Most of them are on moderately steep and steep slopes and are cherty. They have a high risk of erosion. The soils are strongly acid to very strongly acid. Surface runoff is rapid to very rapid, and the water-supplying capacity is low to very low. These soils occupy 18.6 percent of the county. They are poor for crops and poor to fair for pasture.

Use and management.—Most of the uneroded areas are in trees. Many of these areas have been grazed or burned

over, and the timber is of poor quality. A small part of the cleared acreage has been planted to shortleaf pine. Most of the cleared areas are used for pastures, which are mainly unimproved. A few areas, used under a high level of management, are in good permanent pasture. Generally, these soils are used for crops until low yields make such use impractical, and then the areas are pastured or left idle. The main crops are corn, cotton, lespedeza, rye, vetch, and wheat. Some sericea lespedeza is grown.

These soils are too cherty and too steep for tillage. They are not suited to crops and are only slightly better suited to pasture. Most of the areas are best used for trees. The areas now in forest are best left in forest. The soils are suited to common lespedeza, sericea lespedeza, orchardgrass, tall fescue, Ladino and white clovers, redbud, and bermudagrass. They are not suited to corn and other row crops.

Long rotations are needed on these soils, and on most farms they should consist chiefly of close-growing crops. Under good management a row crop can be grown once in every 5 or 6 years. A cover crop that includes a legume should follow the row crop. On areas that can be mowed, a rotation of 1 year of corn, followed by rye and vetch turned under, and 4 to 5 years of sericea lespedeza is suitable. It is best to plant corn at an early date. Time should be allowed in the rotation for the decay of green manure and heavy crop residues that have been plowed under.

Contour tillage and stripcropping are needed where it is feasible to use them. Natural drainageways are best left in sod. Terraces can be used on the less steep soils where suitable outlets are available.

Lime, phosphate, and potash are required for establishing permanent pastures and for all crops, particularly legumes. Nitrogen is not required for legumes and legume-grass mixtures if the seed has been properly in-

TABLE 15.—Soils of management group 10: Estimated average acre yields of principal crops under two levels of management [Yields in columns A are those obtained under common management; yields in columns B are those obtained under good management. Dashes indicate soil is poorly suited to the crop]

Soil	Corn		Cotton (lint)		Lespedeza		Alfalfa		Pasture	
	A	B	A	B	A	A	A	B	A	B
Baxter cherty silt loam:	<i>Bu.</i>	<i>Bu.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>	<i>Cow- acre- days¹</i>	<i>Cow- acre- days¹</i>
Moderately steep phase		30		250	0.4	0.9		1.9	55	85
Eroded moderately steep phase		28		225	.3	.8		1.7	50	75
Moderately steep light colored phase		25		230	.3	.7			30	65
Eroded moderately steep light colored phase		22		210		.6			25	50
Baxter cherty silty clay loam, severely eroded moderately steep phase						.5			20	55
Bodine cherty silt loam:										
Severely eroded sloping phase				150		.5			15	35
Moderately steep phase						.3			25	50
Eroded moderately steep phase						.6			20	40
Minvale cherty silt loam, eroded moderately steep phase		26		270	.4	.8		1.7	55	85
Minvale cherty silty clay loam, severely eroded moderately steep phase						.5			25	65
Mountview silty clay loam, severely eroded sloping shallow phase				250		.6			25	60
Pace cherty silt loam, eroded moderately steep phase						.6				45
Pace cherty silty clay loam, severely eroded sloping phase				175		.6			15	50
Sulphura cherty silt loam, eroded moderately steep phase						.6			20	50

¹ Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days a year that 1 animal unit can be supported on 1 acre without injury to the pasture. An animal unit is the equivalent of 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.



Figure 7.—Pasture on Bodine cherty silt loam, eroded moderately steep phase.

oculated. Small grains and grass crops require a complete fertilizer. Barnyard manure will help maintain organic matter, and in adequate amounts it is a good source of nitrogen and potash.

After pastures are established careful management is required. Regular, frequent applications of fertilizer are needed, and grazing and weeds must be controlled. In most areas, however, mowing of weeds is difficult (fig. 7).

Management Group 11

Steep, eroded, cherty silt loams and miscellaneous land types make up this group. They are strongly acid to very strongly acid and have a low content of organic matter. Surface runoff is very rapid, and the water-supplying capacity is low. The soils of this group occupy 15.9 percent of the land area of the county. They are generally unsuitable for either crops or pasture. The following make up this group:

Baxter cherty silt loam: Steep light colored phase.	Cherty alluvial land. Mines, pits, and dumps. Rockland.
Eroded steep light colored phase.	Sulphura cherty silt loam: Steep phase.
Bodine cherty silt loam: Steep phase. Eroded steep phase.	Eroded steep phase.

Use and management.—The steepest soils in the county are in this group. Bedrock outcrops in places, and there are nearly vertical bluffs along some of the valley slopes. About 65 percent of the acreage is in forest. The trees are chiefly hickory and oak, and stands are generally thin. The cleared areas are mostly in unimproved pasture, and some are idle. On the rest corn is the main crop grown. Yields of crops and pasture are low, and crop failures are common.

These soils are droughty, and the steep slopes and stones hinder the use of farm machinery. The soils are not suited to crops and pasture and are best suited to forest. On some farms these soils are needed for pasture and crops, but if they are used for that purpose, good management is required. A rotation that encourages heavy plant growth is needed if the soils are used for crops. Corn

should be planted early. When the soils are used for pasture, legumes are needed in the pasture sod and grazing must be controlled. Tillage on the contour and use of practices to control runoff are necessary. Lime and a complete fertilizer are required, and pastures particularly require additions of phosphate.

The severely eroded hilly and steep areas can be reclaimed most economically by planting to trees. The soils are best suited to pine. On the less eroded areas, loblolly pine will grow quickly. On the more eroded areas, particularly on the ones with south and west exposures, shortleaf pine is desirable or Virginia pine can be planted. The soils are not well suited to locust, although some farmers may wish to plant locust because of their need for fence posts.

Capability Grouping of Soils⁴

The capability grouping is an arrangement of soils based on relative suitability for crops, grazing, forestry, or wildlife; the risk of erosion or other damage if cover is disturbed; and the need for corrective practices. Soils that are nearly level, well drained, free from overflow, fairly fertile, and otherwise not limited are placed in class I. They are widely adaptable. The farmer can use his class I soils for crops without special practices and can choose one of several cropping systems; or, if he wishes, he may use the soils for pasture or for some other purpose.

Soils are placed in class II if they are a little less adaptable and thus more limited than those in class I. A gently sloping soil, for example, must be farmed on the contour, kept under vegetation most of the time, or handled in some other manner to control erosion. Other soils may be placed in class II because they are too droughty, too wet, or too shallow to be placed in class I.

Class III soils are suitable for regular cropping but have more narrow adaptations for use or more stringent management requirements than soils in class II. Soils that are more limited and that are narrower in crop adaptations than those of class III, but that are still usable for tillage part of the time or with special precautions, are placed in class IV.

Soils poorly suited or not suited to tillage are in classes V, VI, VII, or VIII. Class V, not used in Lawrence County, consists of soils not subject to erosion but unsuited to tillage because of standing water or frequency of overflows. Class VI contains soils that are steep or droughty or that have other serious limitations but that will produce fairly good amounts of forage or forest products. As a rule class VI soils should not be cultivated, but some of them can be disturbed enough to prepare them for planting trees or seeding to permanent pastures. Soils in class VII are more limited than those in class VI and usually give only fair to poor yields of forage or wood products. Soils in class VIII, not used in Lawrence County, are so severely limited that they produce little useful vegetation. They may provide attractive scenery, useful runoff, and havens for wildlife.

Subclasses.—Although the soils within a single capability class present similar use and management problems, the

⁴ This section by C. B. Breinig, State Soil Scientist, Soil Conservation Service.

management problems differ in degree because the soils are different. Class IV in this county, for example, includes some moderately steep, cherty, rapidly permeable soils; some sloping silty clay loams that have rather slow permeability; and some nearly level silt loams that are very slowly permeable. It is convenient to recognize, within the broad classes, capability subclasses based on the dominant limitation. The subclasses used in Lawrence County are based on the following dominant limitations: Risk of erosion (e), excess water (w), and shallow or droughty soils (s). The subclass is denoted by a small letter following the class number, as IIe, IIIw, or VIIs.

CAPABILITY CLASSES AND SUBCLASSES

Capability classes and subclasses in Lawrence County are shown in the following list. The brief description of each subclass gives the general nature of the soils included, and the symbol shown on the soil map follows the name.

Class I.—Soils that are easy to farm and that have no more than slight limitations in use. They may be used under intensive cultivation without special measures to control excess water or erosion, and they may be expected to produce high yields with good soil and crop management. They are nearly level, well drained, permeable, medium textured, and deep. No subclasses of class I are used. The class I soils are—

Ennis silt loam (Ec).
Humphreys silt loam (Hb).
Pembroke silt loam, level phase (Ph).

Class II.—Soils that can be used for tilled crops with only slight risk of erosion or other limitations.

Subclass IIe.—Gently sloping soils subject to erosion.

Baxter cherty silt loam, eroded gently sloping phase (Ba).
Bewleyville silt loam, gently sloping shallow phase (Bt).
Bewleyville silt loam, eroded gently sloping shallow phase (Bu).
Captina silt loam, gently sloping phase (Ca).
Captina silt loam, eroded gently sloping phase (Cb).
Cookeville silt loam, gently sloping phase (Ce).
Cookeville silt loam, eroded gently sloping phase (Cf).
Decatur silt loam, eroded gently sloping phase (Da).
Dickson silt loam, gently sloping phase (De).
Dickson silt loam, eroded gently sloping phase (Df).
Dickson silt loam, eroded gently sloping dark brown surface phase (Dh).
Emory silt loam (Ea).
Etowah silt loam, eroded gently sloping phase (Ed).
Greendale silt loam (Gb).
Humphreys cherty silt loam (Ha).
Minvale cherty silt loam, eroded gently sloping phase (Mb).
Mountview silt loam, gently sloping phase (Mh).
Mountview silt loam, eroded gently sloping phase (Mk).
Mountview silt loam, gently sloping shallow phase (Mm).
Mountview silt loam, eroded gently sloping shallow phase (Mn).
Pace cherty silt loam, eroded gently sloping phase (Pa).
Pace silt loam, eroded gently sloping phase (Pf).
Pembroke silt loam, eroded gently sloping phase (Pk).
Sango silt loam, eroded gently sloping phase (Sc).
Sango silt loam, gently sloping phase (Sb).

Subclass IIs.—Nearly level and level soils limited by stoniness or unfavorable subsoil.

Dickson silt loam, level dark brown surface phase (Dg).
Ennis cherty silt loam (Eb).
Greendale cherty silt loam (Ga).
Sango silt loam, level phase (Sa).

Subclass IIw.—Somewhat poorly drained to moderately well drained bottom-land soils and colluvial soils.

Lobelville cherty silt loam (Ld).
Lobelville silt loam (Le).
Lobelville silt loam, local alluvium phase (Lf).

Class III.—Soils that can be used for tilled crops but under moderate risk of erosion, excess water, or other limitations.

Subclass IIIe.—Sloping soils subject to erosion.

Baxter cherty silt loam, sloping phase (Bb).
Baxter cherty silt loam, eroded sloping phase (Bc).
Baxter cherty silt loam, gently sloping light colored phase (Bf).
Baxter cherty silt loam, eroded gently sloping light colored phase (Bg).
Bodine cherty silt loam, gently sloping phase (Bv).
Bodine cherty silt loam, eroded gently sloping phase (Bw).
Bodine fine cherty silt loam, eroded gently sloping phase (B2e).
Captina silt loam, eroded sloping phase (Cc).
Cookeville silt loam, sloping phase (Cg).
Cookeville silt loam, eroded sloping phase (Ch).
Cookeville silty clay loam, severely eroded sloping phase (Ck).
Decatur silt loam, eroded sloping phase (Db).
Decatur silty clay loam, severely eroded gently sloping phase (Dc).
Decatur silty clay loam, severely eroded sloping phase (Dd).
Etowah silt loam, eroded sloping phase (Ee).
Etowah silty clay loam, severely eroded sloping phase (Ef).
Minvale cherty silt loam, sloping phase (Mc).
Minvale cherty silt loam, eroded sloping phase (Md).
Mountview silt loam, sloping shallow phase (Mo).
Mountview silt loam, eroded sloping shallow phase (Mp).
Pace cherty silt loam, sloping phase (Pb).
Pace cherty silt loam, eroded sloping phase (Pc).
Pace silt loam, eroded sloping phase (Pg).

Subclass IIIw.—Somewhat poorly and poorly drained soils permeable to a depth of 20 inches or more.

Guthrie silt loam, overwash phase (Gd).
Lawrence silt loam (La).
Lawrence silt loam, brown variant (Lb).
Lee silt loam (Lc).
Taft silt loam (Ta).

Class IV.—Soils that have severe limitations when used for cultivated crops and that require extreme care when so used.

Subclass IVe.—Sloping and moderately steep soils that have a high risk of erosion.

Baxter cherty silt loam, moderately steep phase (Bd).
Baxter cherty silt loam, eroded moderately steep phase (Be).
Baxter cherty silt loam, sloping light colored phase (Bh).
Baxter cherty silt loam, eroded sloping light colored phase (Bk).
Baxter cherty silty clay loam, severely eroded sloping phase (Br).
Bodine cherty silt loam, sloping phase (Bx).
Bodine cherty silt loam, eroded sloping phase (By).
Bodine fine cherty silt loam, eroded sloping phase (B2f).
Minvale cherty silt loam, eroded moderately steep phase (Me).
Minvale cherty silty clay loam, severely eroded sloping phase (Mf).
Mountview silty clay loam, severely eroded sloping shallow phase (Mr).
Pace cherty silt loam, eroded moderately steep phase (Pd).
Pace cherty silty clay loam, severely eroded sloping phase (Pe).

Subclass IVw.—Nearly level, poorly drained soils that have a slowly to very slowly permeable layer at a shallow depth.

Guthrie silt loam (Gc).
Robertsville silt loam (Ra).

Class VI.—Soils too steep, too eroded, or too stony for tillage, except occasionally for seeding long-producing pasture or forage, or for planting trees.

Subclass VIe.—Severely eroded, sloping and moderately steep soils low in content of organic matter and plant nutrients.

Baxter cherty silt loam, moderately steep light colored phase (Bm).
Baxter cherty silt loam, eroded moderately steep light colored phase (Bn).
Baxter cherty silty clay loam, severely eroded moderately steep phase (Bs).
Bodine cherty silt loam, severely eroded sloping phase (Bz).
Bodine cherty silt loam, moderately steep phase (B2a).
Bodine cherty silt loam, eroded moderately steep phase (B2b).
Minvale cherty silty clay loam, severely eroded moderately steep phase (Mg).
Sulphura cherty silt loam, eroded moderately steep phase (Sd).

Class VII.—Soils too steep, too stony, or too rough and gullied for tillage.

Subclass VIIe.—Steep soils.

Baxter cherty silt loam, steep light colored phase (Bo).
Baxter cherty silt loam, eroded steep light colored phase (Bp).
Bodine cherty silt loam, steep phase (B2c).
Bodine cherty silt loam, eroded steep phase (B2d).
Sulphura cherty silt loam, steep phase (Se).
Sulphura cherty silt loam, eroded steep phase (Sf).

Subclass VIIi.—Cherty, rocky, and rough land.

Cherty alluvial land (Cd).
Mines, pits, and dumps (Ma).
Rockland (Rb).

Formation and Classification of Soils

The factors that have affected the formation and composition of soils in Lawrence County are discussed in this section, and the soils are classified by higher categories.

Factors of Soil Formation

Soil is formed by weathering and other processes that act on parent material. The characteristics of the soil at any given point depend upon (1) the climate, (2) the plant and animal life, (3) the physical and mineralogical composition of the parent material, (4) the relief, or lay of the land, and (5) age. Through its effect on plants, climate and relief modify the characteristics of the soil. Relief, in turn, strongly influences drainage, aeration, runoff, erosion, and exposure to sun and wind.

Climate

A humid, continental climate prevails in Lawrence County. The summers are long and hot, and the winters are short and mild. Rainfall is abundant and averages about 50 inches a year. Annual snowfall is light. The climate is uniform throughout the county, and no major differences exist among the soils because of it.

Chemical reactions are rapid, as warm weather prevails and the soil is moist much of the time. The large amount of rainfall favors the removal of soluble materials by leaching and the downward movement of less soluble materials and colloidal matter. The alternate freezing and thawing of the soil for only brief periods and to shallow depths further hastens weathering. Many characteristics common to the soils are the result of uniform action of climatic forces on the soil material. Among these are the low content of lime and other bases, the low content of organic matter, and the intensive weathering of parent materials.

Living organisms

Plants, micro-organisms, earthworms, and other forms of life that live on and in the soil are active in the soil-forming processes. The changes they bring about depend, among other things, on the kind of life processes peculiar to each. The kinds of plants and animals are determined by the climate, parent material, relief, age of the soil, and by other organisms.

In general the soils of the county have formed under a deciduous forest. The trees were mainly oak, chestnut, and hickory. As the same association of plants prevailed over the county, there are few differences among the soils because of vegetation.

The trees that commonly grow in the county have roots that go moderately deep or deep to feed on the plant nutrients in the soil. Most of them shed their leaves each year. In this way they return plant nutrients to the upper part of the soil from the lower part of the profile. The content of plant nutrients in the leaves varies. Generally, deciduous trees return larger amounts of bases and phosphorus to the soil in their leaves than do coniferous trees.

In soils formed under forest, much organic matter is added to the soil when leaves, twigs, roots, and entire plants decay. Most of it accumulates on the surface where it is acted on by micro-organisms, earthworms, and other forms of life, and by direct chemical reaction. The plant nutrients released by this decomposition are available for the new growth of plants. As organic material decays, it releases organic acids that make the slowly soluble plant materials more soluble and hasten the leaching and translocation of inorganic materials. The rate of decomposition is strongly influenced by temperature and the amount of moisture present. In Lawrence County, the long summers, short, mild winters, and abundant rainfall hasten decomposition and increase the amount of leaching.

Parent material

The parent material of the soils in the county consist of (1) materials weathered from rock in place, (2) materials transported by wind, water, or gravity and laid down as unconsolidated deposits of silt, sand, and clay and rock fragments. Materials of the first group are related directly to the underlying rocks from which they were derived; materials of the second group are related to the soils or rocks from which they were transported.

The parent materials formed in place consist of weathered products of sedimentary rocks. These rocks differ in chemical and mineralogical composition, and the soils formed from them differ accordingly. They are of Mississippian age. The St. Louis and Warsaw limestones, Fort Payne chert, and Ridgetop shale are the chief

residual formations. Most of the uplands are underlain by chert and clay weathered mainly from cherty limestone formations. Sand and gravel outliers of the Eutaw and Tuscaloosa formations are present but have not contributed greatly to the parent material of the soils.

Studies indicate that loess occurs on the Highland Rim in Tennessee. In some places it is 3 to 4 feet thick, and in others it is less than 2 feet thick or is absent (12). In Lawrence County the smoother upland areas have an overlying thin, silty layer of loess in most places. This layer is in places shallow or lacking, but on the smoother ridges it is as much as 42 inches thick. Some of the terraces are also overlain by loess, and on others the loess is mixed with alluvial materials. This silty material overlies the St. Louis, Warsaw, Fort Payne, Eutaw, and Tuscaloosa formations, as well as much younger terrace deposits. It is therefore presumed to be younger and different in origin from each of these. The silty deposits also show uniformity in color, texture, and other observable characteristics. In many places chert and gravel are in this silty material. These appear to have contributed to the soil material inasmuch as there is sand in the upper part of the profile.

In many soils the boundary between the overlying silty material and the underlying residuum is abrupt. In these soils the upper silty layers are mainly formed from loess and the C horizon has weathered from limestone. Analyses (table 16) indicate considerable differences between the solum and the C horizon of some upland soils. The cherty limestone residuum indicates weathering to a depth of many feet, and in some places there is an old A horizon below the overlying younger soil. In many places the C horizon has a finer texture than the B horizon.

Alluvial materials that form some of the soils were washed from soils derived from silt and sedimentary rocks. Most of the soils were formed from cherty limestone, but in some small areas they were formed from chert-free limestone. The general, or stream, alluvium of the valleys has been carried a long way and is mixed. In many places deposits of this alluvium are deep. The local alluvium was washed or moved by gravity into depressions of the uplands, into intermittent drainageways, or into fans bordering the valleys. In many places these deposits are shallow and overlie older soils but are similar to the nearby soils from which they were washed.

Relief

The soils of Lawrence County range from level or nearly level to very steep. Many of the upland depressions and first bottoms are nearly level, and some upland ridges have very slight slopes. The soils in these areas have little risk of erosion. On some steep areas, where a large amount of water runs off the surface, erosion is rapid and keeps an almost even pace with rock weathering and soil formation.

Some of the soils on steep slopes have shallow profiles, and, in places, there are rock outcrops. The soil materials are constantly being removed by erosion and do not remain in place long enough to form definite horizons. Little water percolates through these soils, and therefore the degree of leaching and amount of translocated materials are small. Vegetation is generally more sparse on these areas than on the smooth slopes. Generally, the

soils on the smooth slopes are somewhat thicker and have better developed profiles than the ones on stronger slopes.

The thickness of the layer of loess is related to differences in relief. Loess overlies the smoother areas to a depth of as much as 42 inches, but on rolling slopes it is generally less than 20 inches thick or is absent. On steeper slopes there is little if any loess.

The major differences among most soils of the uplands are associated with differences in relief and drainage. For example, in the Mountview-Dickson-Lawrence-Guthrie catena the soils all formed from a thin layer of loess that overlies weathered products of cherty limestone. They all have well-developed profiles. The well-drained Mountview soils occur on gently sloping, broad to narrow ridges and in some places occupy knolls within areas of Dickson soils. The moderately well drained Dickson soils occupy smoother gently sloping areas and, in many places, are on wider ridges at slightly lower elevations than the Mountview. The poorly drained Guthrie soils occupy depressions, and the somewhat poorly drained Lawrence soils occupy nearly level areas between Dickson and Guthrie soils. Typically, in the more nearly level areas the soils are grayer and more mottled in color, the pans are more compact, and drainage is more restricted than in steeper areas.

Although differences among soils of the bottom lands also are related to differences in relief and drainage, other factors are involved, as elevation above stream level and the permanent water table, frequency and duration of overflow, and distance from the stream's main channel.

No significant soil differences associated with differences in direction of slope and exposure were noted in the county. Forest growth, however, is more vigorous on the slopes facing north and east than on the slopes facing south and west. The south and west slopes are drier and warmer, so the soils have less moisture available for plant growth.

Age

The soils in Lawrence County range in age from very young to very old, and significant differences among the soils are related to differences in age. The young and very young soils have weak horizons. Their horizons are few or are weakly expressed because time has been too short or because the action of climate has been insufficient to cause greater soil development. Alluvial deposits on foot slopes and stream bottoms are so recent that the forces of climate and vegetation have had little time to bring about much soil formation. In weakly developed, shallow soils on steep slopes, the soil material is removed by erosion about as fast as it is produced. The horizons of young cherty soils on rolling to steep slopes may be weak because they consist of materials that are highly resistant to the action of climate and vegetation.

Old, or mature, soils that have approached equilibrium with their environment have formed in materials that are less resistant to weathering or that have been in place long enough for well-developed profiles to have developed. Among these soils are those formed in loess, those in alluvium on terraces, and many in residuum. The very old soils that are nearly level or gently sloping have more distinct horizons than the mature soils. Erosion has been very slow, and the high degree of profile development indicates a long period of soil formation.

TABLE 16.—Mechanical analyses of eight soils¹

Soil series and location	Depth	Texture	pH	Organic carbon	Size, class, and diameter of particles									
					More than 2.0 mm.	Very fine sand (0.1–0.05 mm.)	Fine sand (0.25–0.1 mm.)	Medium sand (0.5–0.25 mm.)	Coarse sand (1.0–0.5 mm.)	Very coarse sand (2.0–1.0 mm.)	Total sand (0.05–2.0 mm.)	Silt (0.05–0.002 mm.)	Clay (less than 0.002 mm.)	Silt ² (0.02–0.002 mm.)
Bewleyville silt loam (1 mile west of St. Joseph on Iron City road).	Inches 0–7	Silt loam---	5.1	1.12	0.5	1.7	3.1	1.5	1.6	1.0	8.9	78.0	13.1	46.6
	7–24	Silty clay loam.	5.0	.19	4.0	1.8	2.7	1.2	1.6	1.8	9.1	59.6	31.3	38.6
	24–48+	Silty clay---	5.2	.03	5.0	2.6	3.4	1.4	1.3	1.7	10.4	46.6	43.0	31.0
Dickson silt loam (at Park Grove Church).	0–6	Silt loam---	4.8	1.11	.5	2.2	3.7	1.3	1.4	1.2	9.8	78.3	11.9	47.6
	6–18	Silt loam---	4.8	.34	.5	1.4	2.2	.9	.9	1.0	6.4	70.5	23.1	46.5
	18–22	Silt loam---	4.8	.31	.5	1.5	2.2	.9	1.0	1.0	6.6	70.0	23.4	45.4
	22–32	Silt loam---	4.9	.17	.5	1.9	2.7	.9	.7	.6	6.8	73.0	20.2	46.1
	32–40+	Silty clay loam.	4.8	.08	3.0	2.4	3.3	1.1	.9	.7	8.4	60.6	31.0	40.5
Emory silt loam (1 mile southwest of Ethridge and 1 mile west of U. S. Highway 43).	0–28	Silt loam---	5.2	.77	0	1.0	.9	.3	.6	.4	3.2	74.0	22.8	45.4
	28–40	Silt loam---	5.6	1.01	0	1.0	.9	.4	.5	.4	3.2	74.7	22.1	49.7
Ennis silt loam (½ mile southeast of Chinabee on Shoal Creek).	0–8	Silt loam---	6.0	1.22	.5	3.6	2.1	.4	.6	.8	7.5	75.7	16.8	47.3
	8–24	Silt loam---	6.4	.69	.5	2.5	1.5	.6	1.4	1.5	7.5	75.9	16.6	48.2
	24–36+	Silt loam---	6.4	.79	.5	7.6	7.6	1.3	.6	.4	17.5	63.3	19.2	38.5
Guthrie silt loam (½ mile northeast of Mars Hill School).	0–3	Silt loam---	4.3	2.85	0	.2	.4	.2	.1	.1	1.0	85.9	13.1	71.6
	3–18	Silt loam---	4.2	.28	0	.5	.5	.2	.1	0	1.3	83.9	14.8	62.3
	18–32	Silty clay---	4.4	.22	0	.3	.3	.1	.1	0	.8	54.9	44.3	40.5
	32–40+	Silty clay---	4.4	.18	0	.3	.4	.1	.1	0	.9	52.5	46.6	38.7
Mountview silt loam-----	0–5	Silt loam---	4.7	1.35	.5	1.6	6.7	5.8	3.2	.4	17.7	72.6	9.7	44.2
	5–10	Silt loam---	4.9	.58	4.0	1.6	6.4	5.9	2.9	.6	17.4	71.6	11.0	43.5
	10–24	Silt loam (heavy).	4.8	.17	3.0	1.4	5.4	4.6	2.5	.9	14.8	58.4	26.8	38.7
	24–28	Silt loam---	4.7	.17	2.0	1.8	6.6	5.6	3.3	1.4	18.7	58.2	23.1	38.8
	28–60+	Clay-----	4.8	.09	.5	1.9	6.0	5.0	2.8	1.1	16.8	33.2	50.0	22.5
Pembroke silt loam (1 mile west of U. S. Highway 43 and 2 miles south of Ethridge).	0–10	Silt loam---	5.6	1.05	0	1.0	1.3	.6	.7	.5	4.1	79.5	16.4	52.2
	10–28	Silty clay loam.	5.2	.29	0	.5	.6	.3	.7	.4	2.5	65.7	31.8	45.3
	28–42	Silty clay loam.	4.9	.20	0	.7	.8	.4	1.0	.6	3.5	59.8	36.7	41.0
	42–60+	Silty clay---	5.0	.12	.5	1.3	1.5	.5	.6	.6	4.5	45.7	49.8	30.8
Taft silt loam-----	0–6	Silt loam---	5.0	1.37	.5	2.6	3.4	.9	1.1	1.2	9.2	76.8	14.0	48.8
	6–18	Silt loam---	4.8	.18	.5	3.1	6.0	1.8	2.3	2.4	15.6	65.1	19.3	41.4
	18–26	Silt loam---	4.9	.05	5.0	3.0	6.3	1.8	2.2	2.2	15.5	64.8	19.7	41.8
	26–40+	Silt loam---	5.0	.18	3.1	3.8	7.7	3.0	4.7	4.8	24.0	58.2	17.8	36.9

¹ Except for the Taft, Ennis, and Emory, soils were sampled in wooded areas. The Taft, Ennis, and Emory soils were sampled in unwooded areas.

² International scheme.

Classification of Soils

Soils are placed in narrow classes to organize and apply knowledge about their behavior within farms or counties. In contrast, for study and comparison of large areas, such as continents, they are placed in broad classes. In the comprehensive system of soil classification followed in the United States, the soils have been placed in six categories. Beginning at the top, the categories are the order, suborder, great soil group, family, series, and type.

In the highest category the soils of the whole country are grouped into three orders, whereas thousands of soil types are recognized in the lowest category. The suborder and family categories have never been fully developed and thus have been little used. Attention has largely been given to the classification of soils into soil types and series within counties or comparable areas and to the subsequent grouping of series into great soil groups and orders. The nature of the soil series and soil type is discussed in an earlier section, How a Soil Survey is Made.

Subdivisions of soil types into phases, so as to provide finer distinctions significant to soil use and management, are also discussed in the same earlier section.

In the highest category of the classification scheme are the zonal, intrazonal, and azonal orders (9). The zonal order is made up of soils that have evident, genetically related horizons that reflect the predominant influence of climate and living organisms in their formation. The intrazonal order is comprised of soils with evident, genetically related horizons that reflect the dominant influence of a local factor of topography, or of parent material, or of time over the effects of climate and living organisms. The azonal order is made up of soils that lack distinct, genetically related horizons, commonly because of youth, resistant parent material, or steep topography.

The great soil groups in the county are (1) Red-Yellow Podzolic soils, (2) Reddish-Brown Lateritic soils, (3) a Red-Yellow Podzolic-Regosol intergrade, (4) Planosols, (5) Lithosols, and (6) Alluvial soils. This classification is incomplete and may be revised as knowledge about the

soil series and their relations increases. The orders and great soil groups and some important factors that have acted in the genesis of each series are shown in table 17.

Red-Yellow Podzolic soils

The Red-Yellow Podzolic soils belong to the zonal order. These soils are well developed, well drained, and acid and have thin organic and organic-mineral horizons that overlie a light-colored A horizon. The A horizon rests upon a red, yellowish-red, or yellow, more clayey B horizon (8). In Lawrence County the parent materials contained a moderate to large amount of limestone with some chert and other siliceous materials. Where parent materials are thick, the horizons are characteristically streaked or mottled with red, yellow, brown, and light gray.

In this county these soils have formed under a hardwood forest made up chiefly of oak and hickory trees, but there were some beech, maple, yellow-poplar, and other kinds of trees. The soils are on gentle to steep slopes, and drainage is good to somewhat excessive.

TABLE 17.—Classification of the soil series by higher categories and some of the important factors that have contributed to differences in soil morphology

ZONAL SOILS			
Great soil group and soil series	Age	Relief	Parent material
Red-Yellow Podzolic soils:			
Baxter.....	Old.....	Gently sloping to steep.....	Cherty limestone residuum.
Bewleyville.....	Old.....	Gently sloping.....	Thin loess over cherty limestone residuum.
Cookeville.....	Old.....	Gently sloping to sloping.....	Cherty limestone residuum.
Etowah.....	Medium to old.....	Gently sloping to sloping.....	Loess and limestone alluvium (chiefly cherty).
Humphreys.....	Medium to old.....	Gently sloping.....	Chiefly cherty limestone alluvium, some silt.
Minvale.....	Medium to old.....	Gently sloping to moderately steep.....	Chiefly cherty limestone alluvium, some silt.
Mountview.....	Old.....	Gently sloping to sloping.....	Thin loess over cherty limestone residuum.
Pace.....	Medium to old.....	Gently sloping to moderately steep.....	Chiefly cherty limestone, some silt.
Reddish-Brown Lateritic soils:			
Decatur.....	Old.....	Gently sloping to sloping.....	Limestone residuum.
Pembroke.....	Old.....	Nearly level to gently sloping.....	Thin silt over limestone residuum.
Red-Yellow Podzolic-Regosol intergrade:			
Bodine.....	Very young to young.....	Gently sloping to steep.....	Cherty and very cherty limestone residuum.
INTRAZONAL SOILS			
Planosols:			
Dickson ¹	Very old.....	Level to gently sloping.....	Thin loess over limestone residuum (chiefly cherty).
Captina ¹	Very old.....	Gently sloping to sloping.....	Loess and limestone alluvium (chiefly cherty).
Guthrie.....	Very old.....	Nearly level to depressional.....	Thin loess over limestone residuum (chiefly cherty).
Lawrence.....	Very old.....	Nearly level to gently sloping.....	Thin loess over limestone residuum (chiefly cherty).
Robertsville.....	Very old.....	Nearly level to depressional.....	Loess and limestone alluvium (chiefly cherty).
Sango ¹	Very old.....	Level to gently sloping.....	Thin loess over cherty limestone residuum.
Taft.....	Very old.....	Nearly level.....	Loess and limestone alluvium (chiefly cherty).
AZONAL SOILS			
Lithosols:			
Sulphura.....	Very young.....	Moderately steep to steep.....	Noncalcareous shale and cherty limestone.
Alluvial soils:			
Emory.....	Young to very young.....	Nearly level to gently sloping.....	Limestone and silt.
Ennis.....	Very young.....	Nearly level to gently sloping.....	Chiefly cherty limestone, some silt.
Greendale.....	Young to very young.....	Nearly level to gently sloping.....	Cherty limestone and silt.
Lee ²	Young to very young.....	Level.....	Cherty limestone and silt.
Lobelville.....	Young to very young.....	Nearly level to gently sloping.....	Cherty limestone and silt.

¹ Classified also as Red-Yellow Podzolic with fragipan.

² Classified also as Low-Humic Gley.

The soil series in the county in this great soil group are—

Baxter.	Humphreys.
Bewleyville.	Minvale.
Cookeville.	Mountview.
Etowah.	Pace.

The soils of the Mountview series are the most extensive of the Red-Yellow Podzolic soils in the county. They occur on moderately dissected upland areas on gently sloping to sloping ridges. These soils are well drained and have formed under a hardwood forest made up of hickory, oak, and other kinds of trees. The parent material is loess, 42 inches thick in places, that overlies weathered products of cherty limestone.

Profile of Mountview silt loam, gently sloping phase, observed in a recently cleared area:

- A₀₀ About 2 inches of undecomposed leaves, twigs, and other forest litter.
- A₁ 0 to 2 inches, grayish-brown very friable silt loam; moderate content of organic matter.
- A₂ 2 to 5 inches, pale-yellow very friable silt loam; weak fine crumb structure; pH 4.7.
- B₁ 5 to 10 inches, light yellowish-brown friable silt loam; weak fine crumb structure; pH 4.9.
- B₂ 10 to 24 inches, yellowish-brown friable to firm light silty clay loam; contains some small chert fragments; moderate medium blocky structure; pH 4.8.
- B₃ 24 to 28 inches, light yellowish-brown friable heavy silt loam, mottled faintly with light gray and yellow; moderate medium blocky structure; pH 4.7; abrupt transition to layer below.
- D 28 to 60 inches +, dark-brown, compact silty clay or clay, prominently mottled with yellow, reddish brown, gray, and rust color; contains many small angular chert fragments and many quartz and chert pebbles; becomes more cherty with depth; strong fine to medium blocky structure with many subangular faces; pH 4.8.

The Mountview soils are strongly acid to very strongly acid. Except for the thin surface layer, the content of organic matter generally is low. The shallow phases of this series have a thinner surface layer, a thinner subsoil, contain less clay, and are more cherty throughout than the other Mountview soils. The layer of loess is thinner in the parent material and is no more than 20 inches thick. The underlying material varies in color, texture, and consistency, and in content of chert.

The Baxter soils also occur in the uplands and are gently sloping to steep. They were formed chiefly from weathered products of cherty limestone that had a layer of loess in places. The Baxter soils are similar to the Mountview soils in reaction and in content of organic matter. They are more cherty, however, and have a browner surface soil and a redder subsoil than the Mountview soils.

The well-drained Bewleyville soils occupy gently sloping areas in the uplands. They have formed chiefly from weathered products of cherty limestone that had a thin capping of loess. They have a darker brown surface layer and a redder subsoil than the Mountview soils and are slightly less acid.

Except that the Cookeville soils are on somewhat stronger slopes, have a thinner layer of loess and are redder and contain some chert, they are similar to the Bewleyville soils. They also have a thinner subsoil and are shallower over bedrock.

The Etowah soils are similar to the Bewleyville soils. They occur on stream terraces, however, instead of uplands. Also they have somewhat stronger slopes.

The Humphreys soils occur on mild slopes on low terraces. They are browner than the Bewleyville soils and

have little red in the profile. The Humphreys soils are younger than other soils in this great soil group.

The Minvale soils are on gently sloping to moderately steep foot slopes. Except that they are cherty, redder, and less friable in places, they are similar to the Bewleyville soils. They are redder than the Baxter soils and are cherty in comparison with the Etowah soils.

The Pace soils are similar to the Mountview soils. The silt loams occur on gently sloping to sloping terraces and contain some chert throughout. The cherty silt loams occupy gently sloping to moderately steep terraces and foot slopes. They are more cherty, lighter colored, and are shallower over bedrock than the Mountview soils. In some places their profiles are not strongly developed. In other places, where these cherty soils are only moderately well drained, they are not true zonal soils but have characteristics of Planosols.

Reddish-Brown Lateritic soils

The Reddish-Brown Lateritic soils are zonal soils that have dark reddish-brown to reddish-brown mineral surface layers that rest upon a dark-red, clayey, illuvial (B) horizon. These soils lack the light-colored eluvial (A₂) horizon, and their B horizon, or subsoil, is redder than is characteristic of the Red-Yellow Podzolic soils. They have developed under a deciduous forest in a moist, warm-temperate climate. The parent material is weathered high-grade, chert-free limestone, or alluvium or slopewash from soils formed chiefly from limestone.

In Lawrence County two series are in the Reddish-Brown Lateritic great soil group. They are—

Decatur.

Pembroke.

The Decatur soils occupy gently sloping to sloping uplands. They have formed from weathered products of chert-free limestone that had a thin capping of loess in some places. These soils have a brown to light reddish-brown friable surface layer of silt loam and a red, fine-textured, firm subsoil. In this county the Decatur soils are more friable and coarser in texture than soils of this series in east Tennessee.

The Pembroke soils occupy nearly level to gently sloping areas in the uplands. The parent material is a thin layer of loess that overlies weathered limestone. These soils are dark colored and deep. They contain little or no chert and are good for agriculture.

Red-Yellow Podzolic-Regosol intergrade

The Bodine soils are Red-Yellow Podzolic soils that have a weakly developed profile similar to the profile of the Regosols. The Regosols are azonal soils. They consist of unconsolidated parent materials and have weak or no genetic horizons. The A horizon in the Bodine soils is distinct enough to be typical of the Red-Yellow Podzolic soils. The B horizon, however, is weakly developed. In color it differs only slightly from the A horizon, and in places it is little or no finer in texture.

The Bodine soils are on gentle to steep slopes in dissected uplands. They are the most extensive of the soils in the county. The parent material is mainly weathered products of cherty limestone of Mississippian age, but in some places there is a thin layer of loess. In many places the residual mantle is deep, indicating that weathering has taken place over a long period. The strong slopes, high content of siliceous material, and small content of clay-

forming minerals have produced soils that have a thin surface layer and little or no subsoil.

The native vegetation was mainly hickory and oak trees. There were many other kinds of trees, however, and the undergrowth included huckleberry, mountain-laurel, and wild honeysuckle. Where there were no trees and shrubs or the growth was thin, mosses and wild grasses such as broomsedge grew (6).

Profile of Bodine cherty silt loam, sloping phase, in a forest bordering Shoal Creek in the south-central part of the county:

- A₀₀ About 1 inch of undecomposed leaves and other forest litter.
 A₁ 0 to 1 inch, dark grayish-brown very friable cherty silt loam; moderate content of organic matter; many tree roots.
 A₂ 1 to 6 inches, light-gray to light yellowish-brown, friable, gritty, cherty silt loam.
 B₂ 6 to 18 inches, pale-brown to yellowish-brown, friable, cherty silt loam or light silty clay loam; many chert fragments that vary in size; weak to moderate medium uniform structure.
 C 18 inches +, mottled gray, yellow, brown, and weak-red very cherty weathered material of silt loam texture.

Although it varies from place to place, generally the soil is strongly acid and low in phosphorus and exchangeable bases. Except in the surface layer, the content of organic matter is low.

In many places chert beds occur at depths below 18 inches. In many areas the soil is not so well developed as the typical soil and resembles the Regosols.

Planosols

The Planosols are an intrazonal group of soils that have eluviated surface horizons underlain by pans. They have developed on nearly level or gently sloping uplands in a humid or subhumid climate (11).

In Lawrence County these soils occupy nearly level to gently sloping broad uplands and stream terraces. The soils have well-developed profiles and fragipan layers. Drainage is restricted. Soil series in this great soil group are—

Captina.	Robertsville.
Dickson.	Sango.
Guthrie.	Taft.
Lawrence.	

The Planosols in this county are discussed in the following groups: (1) Yellow soils having moderately to strongly developed pans, and (2) gray soils having strongly developed pans.

Yellow soils having moderately to strongly developed pans.—The yellow members have formed under a mixed hardwood forest. Typically, they have strongly eluviated, light-colored A horizons, moderately illuviated slightly darker B horizons, and moderately to strongly developed pan layers. The Captina, Dickson, Lawrence, Sango, and Taft soils are in this group.

The Dickson soils are representative of this group. They have formed on smooth, gently sloping areas in slightly dissected uplands under a forest made up mainly of hickory and oak trees. The parent material was loess that was as much as 42 inches thick over weathered cherty limestone. Because of the gentle slopes and slowly permeable underlying material, drainage is restricted.

Profile of Dickson silt loam, gentle sloping phase, observed near Park Grove Church, in the north-central part of the county:

- A₀₀ About 1 inch of undecomposed leaves and twigs.
 A₁ 0 to 1 inch, dark-gray very friable silt loam; contains much organic matter.
 A₂ 1 to 6 inches, brownish-gray to light yellowish-brown very friable silt loam; weak thin platy structure; pH 4.8.
 B₂ 6 to 22 inches, yellow to light yellowish-brown friable silt loam to silty clay loam, mottled in lower part with yellow and gray; moderate to weak medium blocky structure; pH 4.8.
 B₃ 22 to 32 inches (pan), compact, heavy silt loam mottled with light gray, light yellowish brown, rust color, strong brown, and yellow; contains some chert fragments; pH 4.9.
 C 32 to 40 inches +, mottled pale-yellow, light-gray, and or light-red, firm or compact silty clay loam; contains some chert and has some seams and veins of gray silt; moderate medium blocky structure; pH 4.8.
 D

In places the substratum is several feet thick and becomes more cherty with depth.

The dark brown surface phases of the Dickson soils have formed over somewhat higher grade limestone than the other soils. They are browner in color, have thicker A horizons, and have a somewhat higher content of organic matter and minerals in the A and B horizons. Also, depth to the pan is greater, and the pan is less compact and contains a greater number and larger concretions.

Available data indicate that the Dickson soils are strongly acid to very strongly acid. The content of organic matter is generally low, and these soils are low in phosphorus, potassium, and other exchangeable bases.

The Captina soils occupy gently sloping to sloping terraces and foot slopes. Except that they have formed from mixed alluvium and in places have slightly thicker and darker A horizons, they are similar to the Dickson soils. The pan layer is variable, and in places these soils contain some chert.

The Lawrence soils occupy nearly level areas or slight depressions. Lawrence silt loam is not so well drained as the Dickson and Sango soils. It has a grayish A horizon, a thin, yellow B horizon, and a well-developed pan at depths of 16 to 24 inches. The soil is strongly to very strongly acid.

Lawrence silt loam, brown variant, has formed over a higher grade of limestone than the Dickson soils and has some local alluvium in the upper layers. It is a younger soil and is darker colored. It has a larger content of minerals and organic matter and contains many concretions. The pan layer, which occurs at depths of 18 to 20 inches, contains many concretions, and in some places it is not well developed. This soil is similar to the dark brown surface phases of the Dickson soils but is more poorly drained. Its underlying material resembles that of the lateritic soils to some extent. Although this soil has some characteristics similar to the Planosols, its age indicates it is not a true Planosol.

The Sango soils are on level to gently sloping areas and are formed from parent material similar to that of the Dickson soils. They have a lighter color, a pan layer that is thicker and at a shallower depth, and slower drainage.

Taft silt loam, the only Taft soil in the county, occupies terrace areas that are nearly level to depressional. It is more poorly drained, lighter in color, and shallower to the pan layer than the Dickson soils. In a few places the Taft soil has a darker colored and thicker A horizon. It contains chert in the profile and is strongly acid to very strongly acid.

Gray soils having strongly developed pans.—The gray members of the Planosols great soil group occupy nearly

level areas or depressions on upland terraces. The soils have formed under grass or forest in a humid or subhumid climate. Typically, these soils, which have formed under restricted drainage, have strongly developed pans at shallow depths. They have light-colored, eluviated A horizons, are low in organic matter, and are underlain by a compact, very slowly permeable layer. This pan layer is considered part of the B horizon because it is strongly illuviated. The C horizon is also compact and slowly permeable.

These soils have formed from parent material similar to that of soils of the Red-Yellow Podzolic groups and to other Planosols. Although all of these soils have formed under hardwood forest, the trees on these gray soils were mainly water-tolerant types. The differences between these soils and other zonal soils in the county are related to the mild relief and less active geologic erosion, the slowly permeable substrata, and the silty parent material. The soils in this group are the Guthrie and Robertsville.

The poorly drained Guthrie soils have formed under a hardwood forest on upland areas that are nearly level to depressional. The trees were mainly water-tolerant gum, hickory, maple, and oak, but there were some other species. In some places various kinds of grasses and sedges covered the ground. The parent material was a layer of loess about 3½ feet thick over cherty limestone.

Profile of Guthrie silt loam observed in a wooded area in the northeastern part of the county:

About ½ inch of undecomposed leaves and organic matter.

A₁ 0 to 3 inches, light-gray or gray very friable silt loam or silt stained with organic matter; very weak very fine crumb structure or structureless; pH 4.3.

A₂ 3 to 18 inches, light-gray friable silt loam; many pale-yellow and rust-colored, faint, fine mottles; white when dry and may have an "ashy" feel; structureless; pH 4.2.

B 18 to 42 inches (pan), dark-gray, compact, massive silty clay to clay; has pale-yellow and rust-colored mottles that increase in size and number with depth; strong medium to coarse blocky structure; pH 4.4.

C 42 to 52 inches +, very compact gray silt loam mottled with pale yellow and rust color; contains a few chert fragments and granite pebbles; strong medium to coarse blocky structure; pH 4.3; grades to cherty limestone residuum at a depth of 5 feet or more.

The slight accumulation of raw organic matter in the surface layer (2 to 3 percent) and its slow decomposition are related to the restricted drainage.

Guthrie silt loam, overwash phase, is similar to Guthrie silt loam, but it has a thicker, darker colored surface layer.

Except that it is somewhat younger and has a lighter, slightly less compact pan layer, Robertsville silt loam is similar to the Guthrie soils. It has formed from similar materials, and it is poorly drained and occupies terrace positions.

Lithosols

The Lithosols are azonal soils. They have no clearly expressed soil morphology and consist of a mass of freshly and imperfectly weathered hard rock or of fragments of hard rock. In Lawrence County most of these soils are on steep slopes where geologic erosion is rapid. Much of the material has been washed away as fast as it formed,

and a complete sequence of horizons has not developed.

The Sulphura soils are the only Lithosols mapped in this county. These soils occur mainly on slopes of 25 to 65 percent or more, but a few areas are on slopes of 12 to 25 percent. They have formed under a forest made up mainly of hickory and oak trees. The parent material is gray, green, or bluish noncalcareous and nonphosphatic shale. On most areas a layer of cherty colluvium, as much as 20 inches thick, covers the other parent materials. This colluvium has sloughed from Bodine or Baxter soils that occupy steep slopes above the Sulphura soils.

Description of a profile observed on the east side of Knob Creek in the southwestern part of the county:

0 to 7 inches, pale-brown to dark-brown friable cherty silt loam; contains many chert fragments as much as 4 inches across; there are some outcrops of shale.

7 to 43 inches +, light-green noncalcareous shale; mottled and stained with black and yellow.

Alluvial soils

The Alluvial soils are an azonal group of soils developed from transported and relatively recently deposited material (alluvium). This alluvium has been only weakly modified, if at all, by soil-forming processes. The soils have nearly level or gently sloping relief, and some occur in depressions. Drainage is good to poor. The soils have properties that are closely related to those of the alluvial deposits.

Alluvial soils derived from similar parent material may have different properties as a result of differences in drainage. Differences in such soils are mainly associated with good, imperfect, or poor drainage.

The Alluvial soils in this county are of these series—

Emory.	Lee.
Ennis.	Lobelville.
Greendale.	

The Emory and Greendale soils occur at the bases of upland slopes and stream terraces and along small drainageways. They are made up of recent local alluvium washed from soils of upland and stream terraces. In contrast to the Greendale soils, the Emory soils are chert free, have more clay, and are darker colored. They are well drained, and the Greendale soils are moderately well drained.

The Ennis, Lee, and Lobelville soils occur on bottom lands in river and creek valleys. Their parent material was washed from weathered cherty limestone and loess. These soils have chert and gravel on the surface and throughout their profiles. The Ennis soils are brown in color and are well drained; the Lobelville soils are moderately well drained to somewhat poorly drained and are mottled; and the Lee soil is gray in color and is poorly drained. Most of these soils are medium acid to strongly acid. They generally have a higher content of minerals and organic matter than most upland or terrace soils.

In some places the local alluvium phase of the Lobelville soil is made up of recent alluvium deposited over older soils, such as the Dickson and Lawrence. Here, the soil resembles the Planosols, but has a thicker, darker colored surface layer.

Glossary

Acidity. The degree of acidity of a soil mass, 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 alkali-	
Slightly acid-----	6.1-6.5	line-----	9.1 and higher
Neutral-----	6.6-7.3		

Alluvium. Soil materials, as sand, silt, or clay, deposited on land by streams.

Local. Sediments deposited, near their source, by streams that are generally small. These sediments are closely related to the soils from which they were washed.

General. Sediments deposited by larger streams. This material has usually been carried a considerable distance from its source, has come from many soils or sources, and may be well mixed. The deposits are not necessarily closely related to the adjacent older soils.

Bedrock. The solid rock underlying soils.

Catena. A group of soils within a specific soil zone that have formed from similar parent material but are different in profile characteristics because of differences in relief or drainage.

Chert. A structureless form of silica, closely related to flint, that breaks into angular fragments.

Colluvium. Mixed deposits of soil materials and rock fragments near the bases of steep slopes. The deposits have accumulated as the result of soil creep, slides, and local wash.

Consistence. The combination of properties of soil material that determine its resistance to crushing and its ability to be molded or changed in shape. Consistence depends mainly on the forces of attraction between soil particles. Terms used in the report to describe consistence follow.

Compact. Dense and firm but without any cementation.

Firm. Crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Friable. Crushes easily under gentle to moderate pressure between thumb and finger, and coheres when pressed together.

Plastic. Capable of being molded; moderate pressure required to change its form; puttylike.

Very friable. Crushes under very gentle pressure but coheres when pressed together.

Drainage. The rapidity and extent of removal of the water from the soil, especially by runoff and flow through the soil to underground spaces. Includes internal and natural drainage.

Erosion. Removal of soil material by water or wind.

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

Fragipan. Dense and brittle pans or layers in soils that owe their hardness mainly to extreme density or compactness rather than to high clay content or cementation.

Horizon, soil. A layer of soil, approximately parallel to the soil surface and different in appearance and characteristics from the layers above and below it.

Lespedeza, common. For purposes of this report, the same as annual lespedeza.

Loess. Geological deposit of fairly uniform fine material, mostly silt, presumably transported by wind.

Mottling. Spots, or splotches, of color in soils. A common cause of mottling is imperfect or impeded drainage, although there are other causes, such as soil development from an unevenly weathered rock.

Pan, soil. A layer within a soil that is firmly compacted or is very rich in clay.

Parent material. The unconsolidated mass of rock material (or peat) from which the soil profile develops.

Parent rock. The rock from which the soil parent material is formed or weathered.

Permeability, soil. The quality of a soil that enables water or air to move through it.

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

Reaction. See Acidity.

Relief. Elevations or inequalities of the land surface, considered collectively.

Residual material. Unconsolidated and partly weathered parent material of soils presumed to have developed from the same kind of rock as that on which the parent material lies.

Slope. The incline of the surface of a soil. It is commonly expressed in percentage of slope, which equals the number of feet of fall per 100 feet of horizontal distance. In Lawrence County the slope classes are—

	Percent	Percent	
Level-----	0 to 2	Moderately steep. 12 to 25	
Gently sloping----	2 to 5	Steep-----	25 and more
Sloping-----	5 to 12		

Soil. The natural medium for the growth of land plants on the surface of the earth; it is composed of mineral and organic matter.

Solum. The upper part of the soil profile, above the parent material, in which the processes of soil formation are active.

Structure, soil. The arrangement of the individual grains into aggregates with definite shape or pattern; refers to natural arrangement of the soil when in place and undisturbed or to the soil at any degree of disturbance.

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

Substratum. Any layer lying beneath the solum, or true soil. The term is applied to both parent material and to other layers unlike the parent material that are below the B horizon, or subsoil.

Surface soil. Commonly, that part of the profile that is stirred by tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. Technically, the A horizon.

Terrace (geologic). An old, nearly level or undulating alluvial plain, seldom subject to overflow, that borders a stream, a lake, or the sea. Also called second bottoms.

Tilth. The physical condition of a soil in respect to its fitness for growing a specified plant or sequence of plants.

Upland (geologic). Land consisting of material unworked by water in recent geologic time and lying, in general, at higher elevations than the alluvial plain, or stream terrace.

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