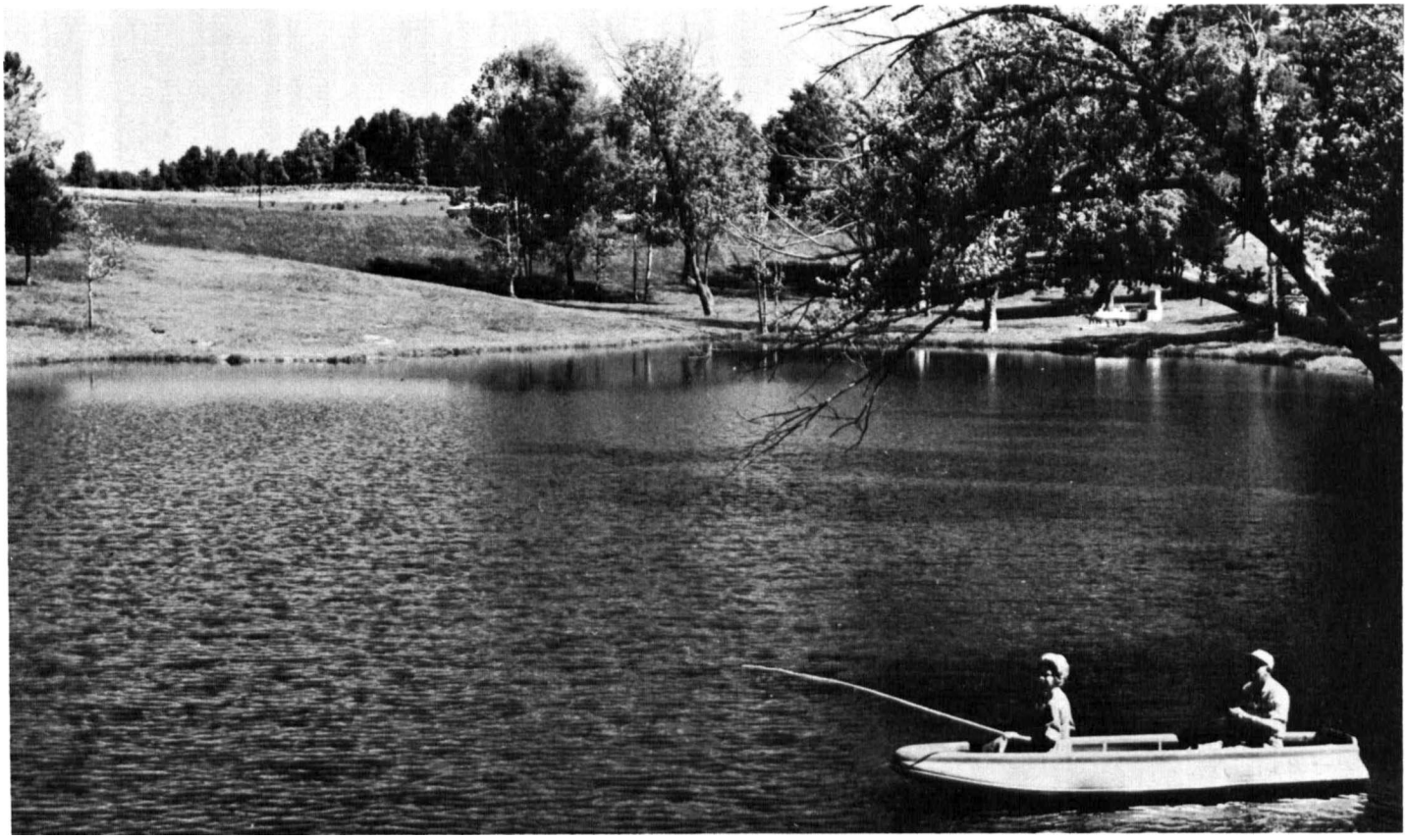
Issued February 1967

SOIL SURVEY

Metcalfe County, Kentucky



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

Major fieldwork for this soil survey was done in the period 1957–1962. Soil names and descriptions were approved in 1965. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1960–1965. This survey of Metcalfe County was made as part of the technical assistance furnished by the Soil Conservation Service to the Metcalfe County Soil Conservation District.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY of Metcalfe County, Ky., contains information that can be applied in managing farms and woodland; in selecting sites for roads, ponds, buildings, or other structures; and in appraising the value of tracts of land for agriculture, industry, or recreation.

Locating Soils

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

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

Finding and Using Information

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

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Interpretations not included in the text can be developed by grouping soils according to suitability or degree of limitation for a particular use. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units.

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

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife in the section "Wildlife."

Engineers and builders will find under "Soils in Engineering" tables that give descriptions of the engineering properties of the soils in the county and that name soil features that affect engineering practices and structures.

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

Students, teachers, and others will find information about soils and their management in various parts of the text, depending on their particular interest.

Newcomers in Metcalfe County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the County," which gives additional information about the county.

Cover picture: **This farm pond near Beaumont is used for stock water, irrigation, and recreation. It is 1 acre in size and is fed by a watershed of 20 acres. The surrounding soil is Baxter cherty silt loam.**

U.S. GOVERNMENT PRINTING OFFICE: 1967

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Contents

NOTICE TO LIBRARIANS

Series year and series number are no longer shown on soil surveys. See explanation on the next page.

Issued February 1967

EXPLANATION

Series Year and Series Number

Series year and number were dropped from all soil surveys sent to the printer after December 31, 1965. Many surveys, however, were then at such advanced stage of printing that it was not feasible to remove series year and number. Consequently, the last issues bearing series year and number will be as follows:

Series 1957, No. 23, Las Vegas and Eldorado Valleys Area, Nev.
Series 1958, No. 34, Grand Traverse County, Mich.
Series 1959, No. 42, Judith Basin Area, Mont.
Series 1960, No. 31, Elbert County, Colo. (Eastern Part).
Series 1961, No. 42, Camden County, N.J.
Series 1962, No. 13, Chicot County, Ark.
Series 1963, No. 1, Tippah County, Miss.

Series numbers will be consecutive in each series year, up to and including the numbers shown in the foregoing list. The soil survey for Tippah County, Miss., will be the last to have a series year and series number.

SOIL SURVEY OF METCALFE COUNTY, KENTUCKY

REPORT BY EARLE E. LATHAM AND ARLIN J. BARTON, SOIL CONSERVATION SERVICE

SOILS SURVEYED BY EARLE E. LATHAM, ARLIN J. BARTON, DONALD S. HENRY, AND RONALD D. FROEDGE, SOIL CONSERVATION SERVICE

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

METCALFE COUNTY is in the south-central part of Kentucky (fig. 1). It has an area of approximately 296 square miles, or 189,440 acres. Edmonton is the county seat.

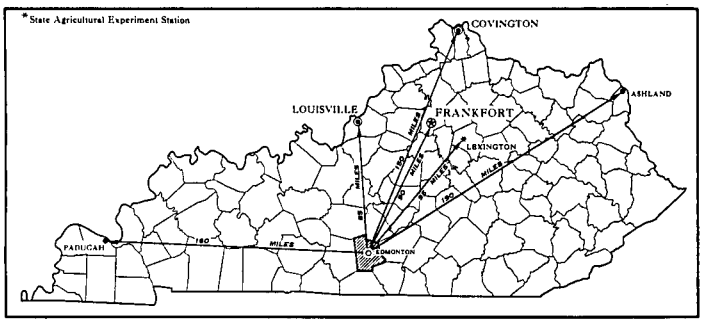

Figure 1.—Location of Metcalfe County in Kentucky.

How This Soil Survey Was Made

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

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Baxter and Crider, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the natural landscape. Soils of one series can differ somewhat in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Baxter cherty silt loam and Baxter cherty silty clay loam are two soil types in the Baxter series. The difference in texture of their surface layers is apparent from their names.

Some types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Baxter cherty silt loam, 2 to 6 percent slopes, is one of several phases of Baxter cherty silt loam, a soil type that has a slope range of 2 to 30 percent.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this report was prepared from aerial photographs.

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

In preparing some detailed maps, the soil scientists have a problem of delineating areas where different kinds of soils are so intricately mixed or occur in such small individual tracts that it is not practical to show them separately on the map. Therefore, they show this mixture of soils as one mapping unit and call it a soil complex. Ordinarily, a soil complex is named for the major kinds of soil in it, for example, Baxter-Talbott rocky silt loams, 6 to 12 percent slopes, eroded. Another kind of mapping unit is the undifferentiated group, which consists of two or more soils that occur together without regularity in pattern or relative proportion. The individual tracts of the component soils could be shown separately on the map, but the differences between the soils are so slight that the separation is not important for the objectives of the soil survey. An example is Dandridge and Westmoreland shaly silt loams, 12 to 20 percent slopes. Also, on most soil maps, areas are shown that are so rocky, so shallow, or so frequently worked by wind and water that they scarcely can be called soils. These areas are shown on the soil map like other mapping units, but they are given descriptive names, such as Gullied land or Rock land, and are called land types rather than soils.

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

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in soil survey reports. On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust them according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

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

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

In this county there are five associations. These are discussed in the following pages.

1. Cumberland-Crider association

Gently sloping to strongly sloping, well-drained upland soils that formed in material weathered from limestone

This association (fig. 2) is in the extreme northwestern part of the county, mainly in a karst area. The topog-

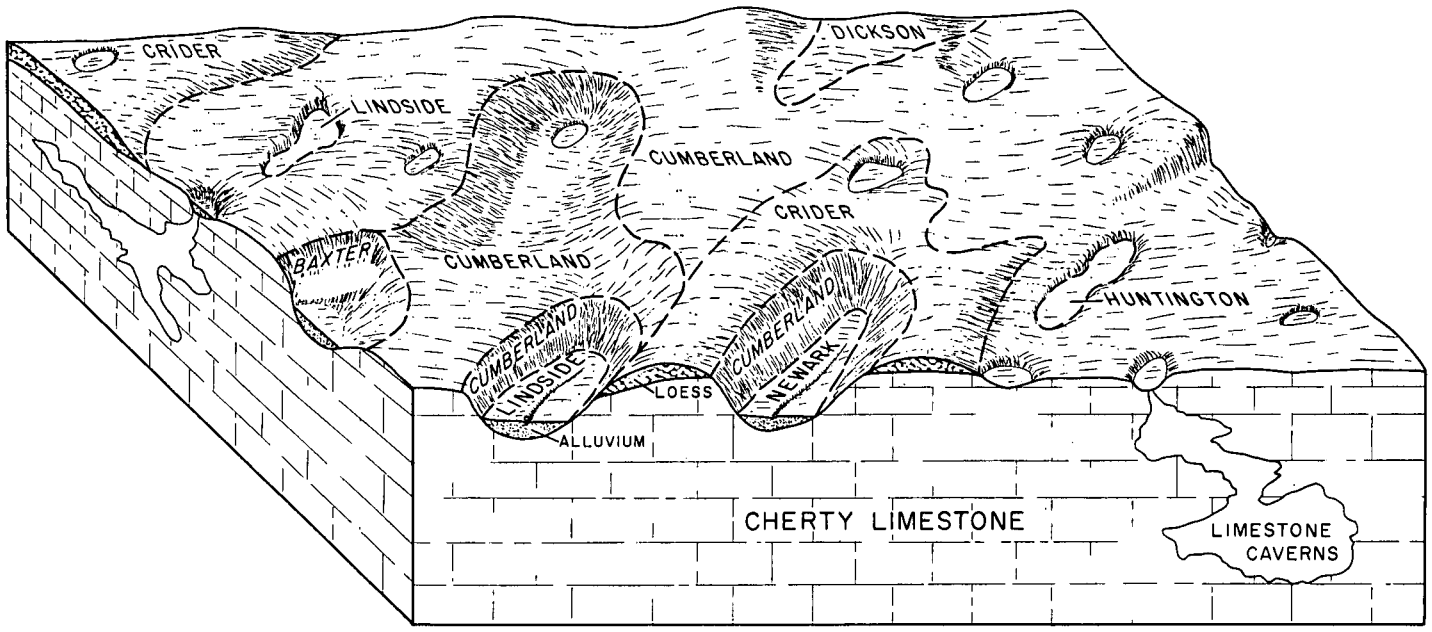

Figure 2.—Relationship of soils to topography and parent material in the Cumberland-Crider association.

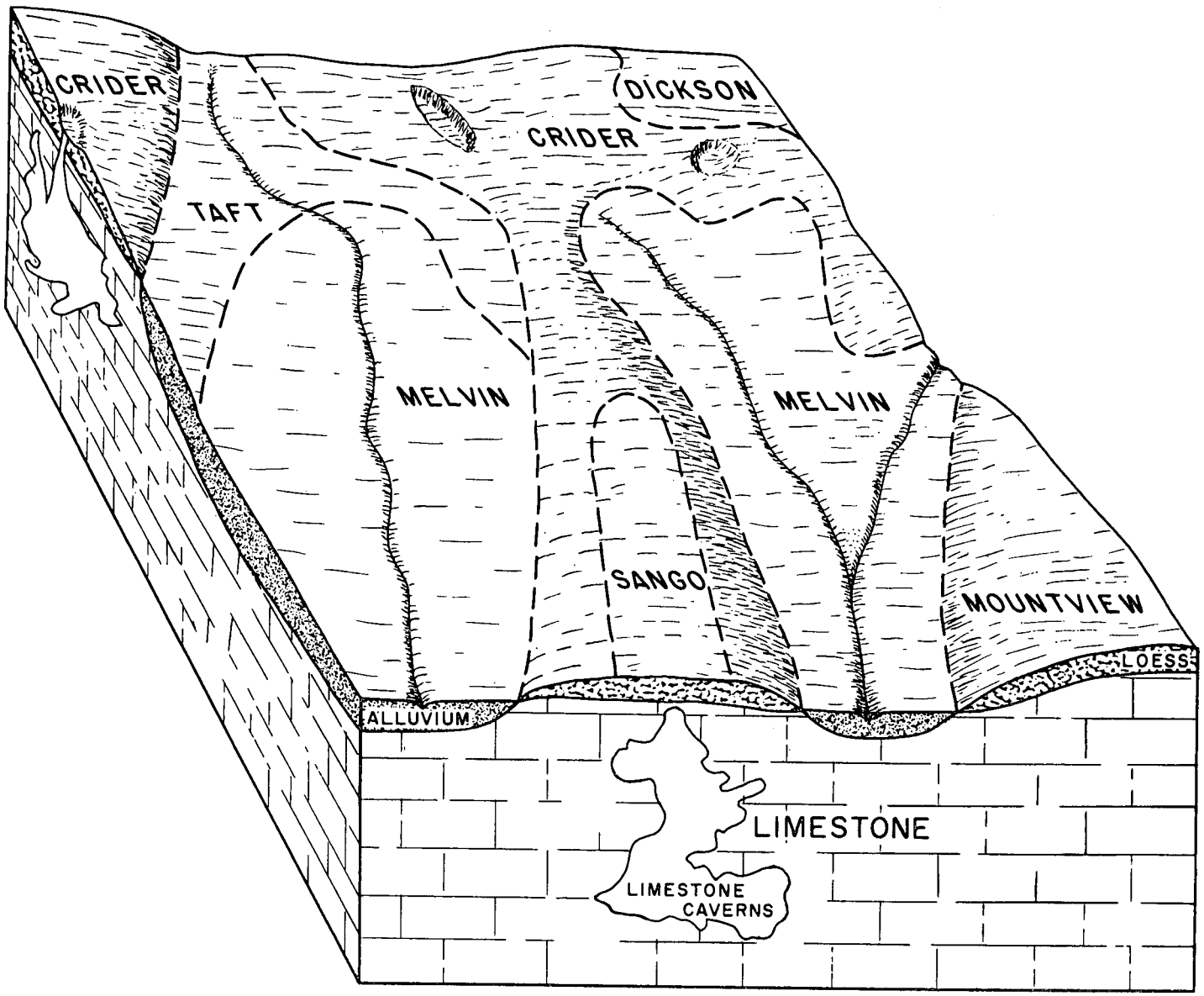

Figure 3.—**Relationship of soils to topography and parent material in the Melvin-Crider association.**

raphy is irregular, and sinkholes and depressions are common. The association occupies about 3 percent of the county.

The Cumberland and Crider soils make up about 85 percent of this association. The Cumberland soils occur mainly on the stronger slopes, and the Crider soils mainly in gently sloping areas. The Cumberland soils are the more extensive. They are cherty throughout the profile. The Crider soils are deep and well drained. They have a few fragments of chert in the lower part of the profile.

The Baxter, Dickson, Huntington, Lindside, and Newark soils make up a minor part of the acreage. The Baxter soils are deep, well drained, and cherty. The Dickson soils are deep, are moderately well drained, and have a fragipan. The Huntington, Lindside, and Newark soils formed in alluvium and are in depressions. The Huntington soils are well drained, the Lindside soils are moderately well drained, and the Newark soils are somewhat poorly drained.

Most of this association is suitable for cultivation; nearly 95 percent of it is used for corn, tobacco, small grain, and pasture. Farms are generally about 65 acres in size, but a few are larger. Most are operated by the owners, but a few by tenants. There are a few hardwood woodlots about 1 acre to 5 acres in size.

2. *Melvin-Crider association*

Mainly level, poorly drained depressional soils that formed in alluvium and gently sloping, well-drained upland soils that formed in material weathered from limestone

This association (fig. 3) is a narrow, irregular strip in the northwestern part of the county. Depressions 100 acres or more in size are common, and smaller sinkholes dot the area. Several intermittent streams rise in this

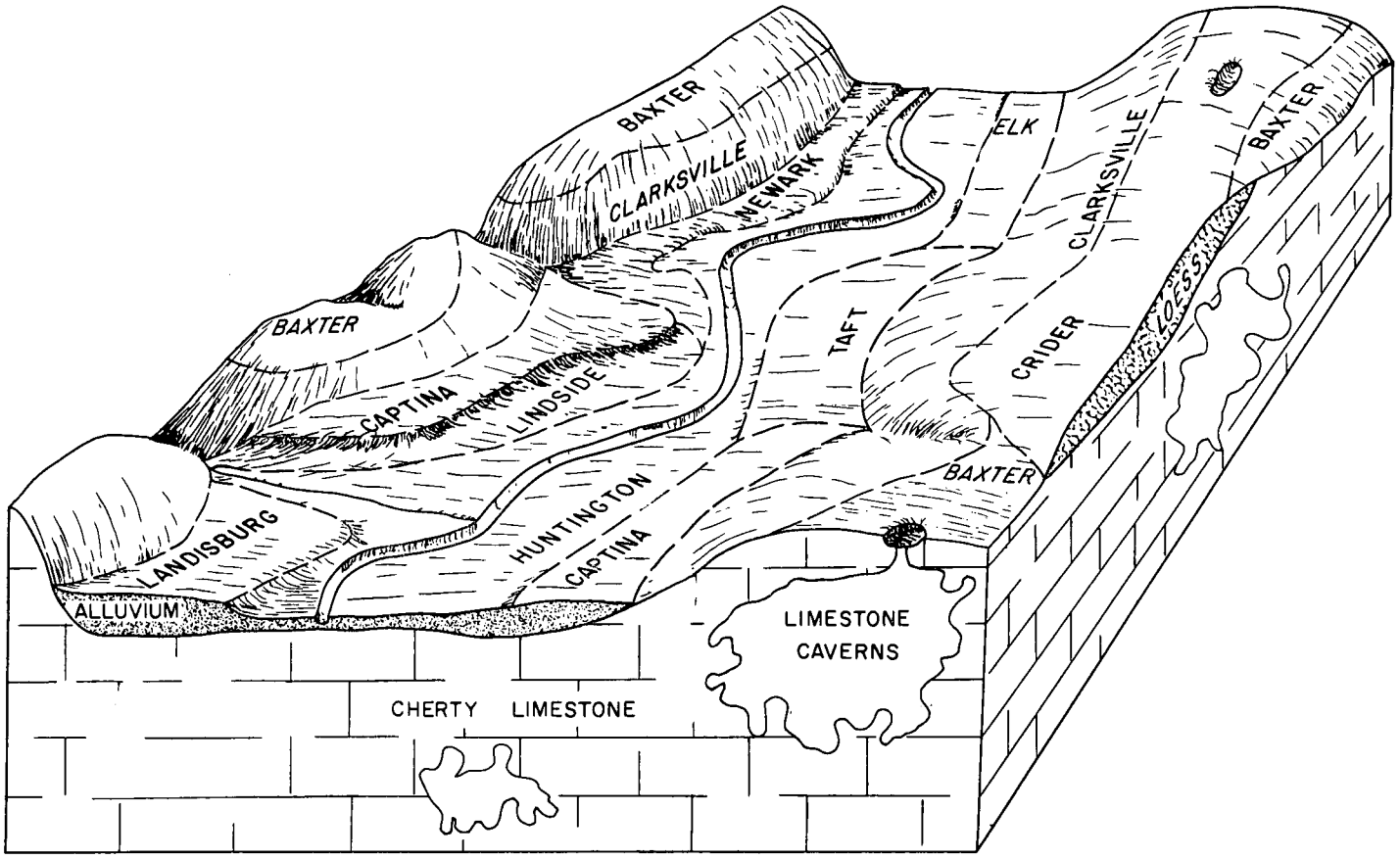

Figure 4.—**Relationship of soils to topography and parent material in the Baxter-Crider-Clarksville association.**

association, which occupies about 7 percent of the county.

The Melvin and Crider soils make up the major part of this association. The Melvin soils are in depressions and level areas, and the Crider soils occur mainly in gently sloping areas. The Melvin soils are poorly drained. They have a seasonally high water table, and some areas are flooded periodically. The Crider soils are deep and well drained. In places they have small fragments of chert in the lower part of the profile.

The Dickson, Sango, Mountview, and other minor soils in this association are deep or moderately deep and well drained or moderately well drained. The Dickson and Sango soils have a fragipan at a depth of 20 to 30 inches.

The large acreage of wet soils makes this association unsuitable for intensive cultivation. Potential production of timber is fair to good. Most of the acreage of the Melvin soils is in hardwood forest, a small part is in cultivated crops, and the rest is in pasture. Nearly all of the acreage of the Crider soils is used for corn, tobacco, small grain, hay, and pasture. Farms are generally about 75 acres in size. Most are operated by the owners, but a few by tenants.

3. *Baxter-Crider-Clarksville association*

Nearly level to moderately steep, well-drained soils, mainly cherty, that formed in material weathered from limestone

This association (fig. 4) occupies most of the central and western parts of the county. Broad, nearly level ridges and short side slopes characterize the topography generally, but in places karst topography is dominant. Several streams flow through this association, which makes up about 61 percent of the county.

Soils of the Baxter, Crider, and Clarksville series make up about 70 percent of this association. The Baxter and Clarksville soils were derived from cherty limestone. The Crider soils formed partly in loess and partly in residuum from limestone.

The Dickson, Mountview, Huntington, Lindside, Newark, Captina, Humphreys, Landisburg, Elk, and Taft soils make up a minor part of the acreage. The Huntington, Lindside, and Newark soils occupy areas 250 feet to nearly 1,000 feet wide along stream bottoms. The Captina, Humphreys, Landisburg, Elk, and Taft soils occupy terraces and foot slopes. The Huntington soils are well drained, the Lindside soils are moderately well drained, and the Newark soils are somewhat poorly drained.

This association has an excellent potential for production of field crops and timber. Most of the nearly level to strongly sloping acreage is used for corn, tobacco, small grain, hay, and pasture. Farms are generally about 75 acres in size, but a few are larger. About 15 percent of this association is moderately steep. Most of the moderately steep areas are in hardwoods, principally oak, hickory, poplar, and redcedar. A few are in unimproved pasture.

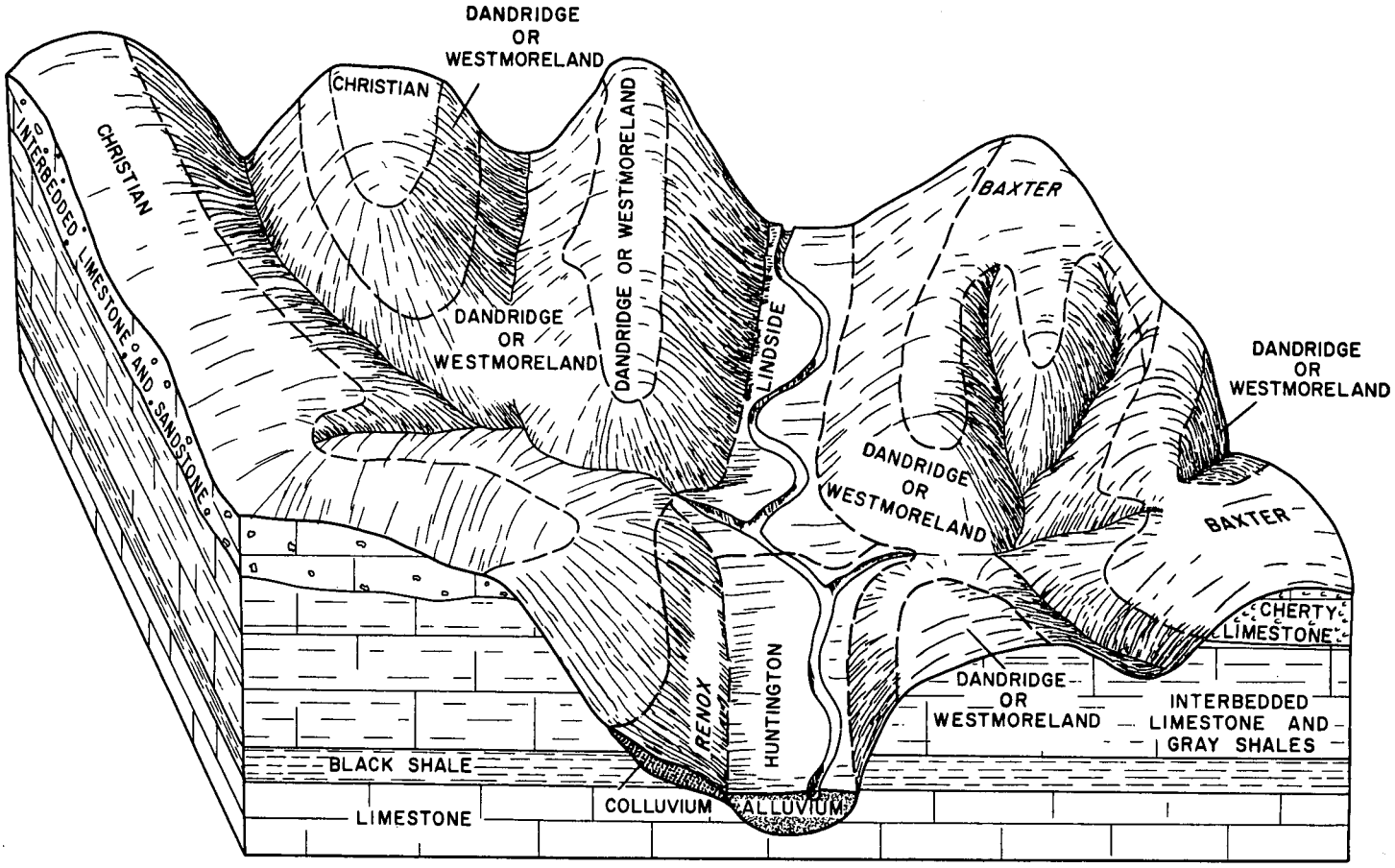

Figure 5.—**Relationship of soils to topography and parent material in the Dandridge-Westmoreland-Christian association.**

4. *Dandridge-Westmoreland-Christian association*

Mainly steep or very steep, somewhat excessively drained, shaly, highly dissected, shallow soils on side slopes and very narrow ridgetops

This association (fig. 5) is in the southeastern part of the county. It is principally an area of steep or very steep slopes and narrow ridgetops. It makes up about 20 percent of the county.

The Dandridge and Westmoreland soils occur in a random pattern, mainly on rugged, steep side slopes. These soils are shaly and medium textured. The Dandridge soils are less than 20 inches deep over bedrock. They are more extensive than the Westmoreland soils, which are generally 20 to 30 inches deep. The Christian soils occur on narrow and very narrow ridgetops. They developed in parent material derived from limestone, sandstone, and shale. They are yellowish red and clayey, but in places their subsoil is sandy. The Christian soils are deeper than the Dandridge and Westmoreland soils.

The Baxter, Humphreys, Landisburg, Huntington, Lindside, and Newark soils make up a minor part of the acreage. The Baxter soils are cherty and clayey. The Humphreys soils are cherty and well drained. The Landisburg soils are moderately well drained. The Humphreys and Landisburg soils occur on foot slopes. Moderately wide areas of the Huntington, Lindside, and Newark soils, which formed in alluvium, occur on first bottoms along the Forks of the Little Barren River and along some of the larger creeks. These soils are subject to flooding. The Huntington soils are well drained, the Landisburg soils are moderately well drained, and the Newark soils are somewhat poorly drained.

About 75 to 80 percent of this association is in forest. Although nearly all of the acreage of the Dandridge and Westmoreland soils has been cut over, only a small part has been completely cleared and cultivated. Much of this has reverted to woodland. Farming is limited in this association because the slopes are steep and the soils are shallow. The best potential use is the production of timber. The Huntington, Lindside, and Newark soils are agriculturally the most important soils of the area. Generally, the Christian soils are too narrow or too rolling to be used for cultivated crops, but some of the wider ridges have been cleared.

5. *Dandridge-Westmoreland-Caneyville-Baxter association*

Mainly steep, somewhat excessively drained, shaly, dissected, shallow soils on side slopes and narrow or moderately narrow ridgetops

This association (fig. 6) is in the eastern and northeastern parts of the county. The soils on the ridgetops are deep, clayey, and well drained. This association makes up about 9 percent of the county.

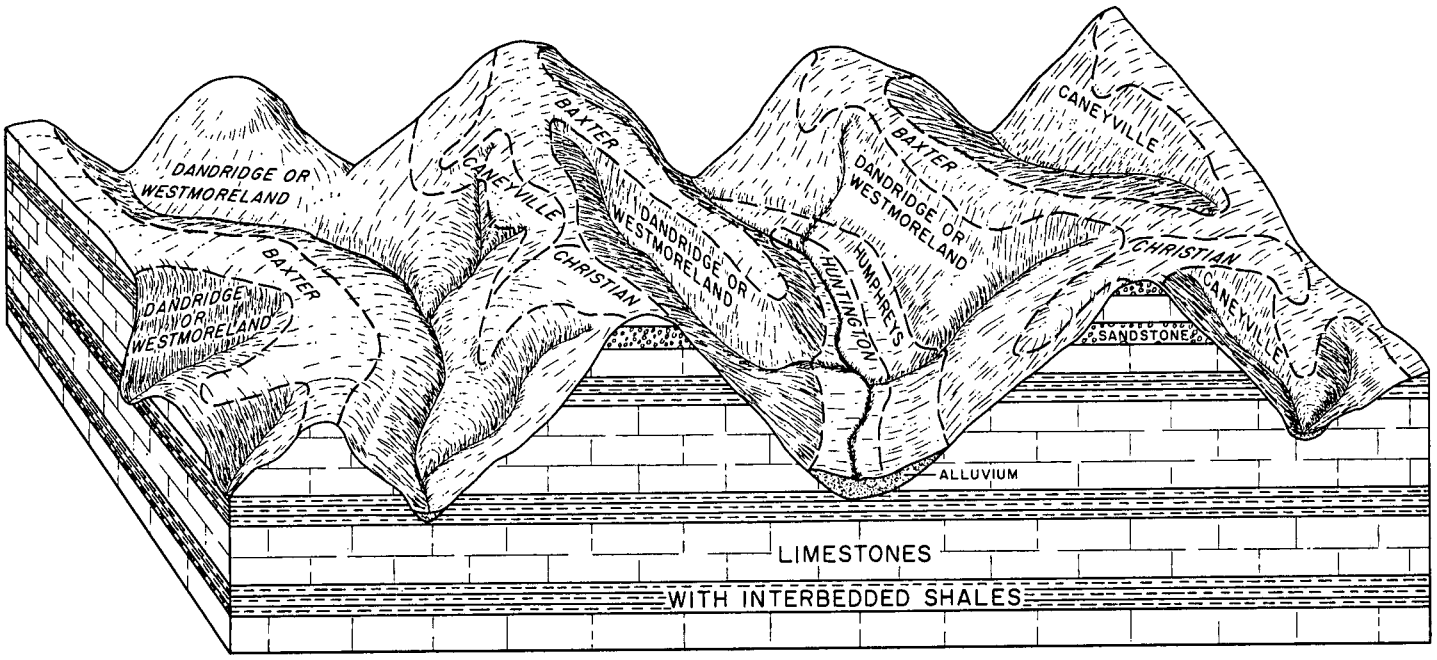

Figure 6.—**Relationship of soils to topography and parent material in the Dandridge-Westmoreland-Caneyville-Baxter association.**

The Dandridge, Westmoreland, and Caneyville soils occur on steep side slopes. The Dandridge and Westmoreland soils occur in nearly equal proportions in an irregular pattern on the lower and steeper parts of the side slopes. The Dandridge soils are generally less than 20 inches deep over bedrock. The Westmoreland soils are generally 20 to 30 inches deep. Soils of both series are medium textured and contain many small fragments of shaly limestone. Soils of the Caneyville series occupy higher positions on side slopes and are moderately steep or steep. They are shallow to deep, well-drained, and rocky, and they have a yellowish-red, clayey, plastic subsoil. In places they are sandy. Soils of the Baxter series occupy the ridgetops. They are deep, cherty, clayey, and well drained.

The Christian, Humphreys, Landisburg, Huntington, Lindside, and Newark soils make up a minor part of this association. The Christian soils occur on ridgetops with the Baxter soils. They developed in residuum weathered from limestone, sandstone, and shale. The Humphreys and Landisburg soils occur as narrow strips on foot slopes where the slope is 2 to 12 percent. The Humphreys soils are cherty and well drained; the Landisburg soils are moderately well drained. The Huntington, Lindside, and Newark soils formed in alluvium. They occur on first bottoms and are subject to flooding. The Huntington soils are well drained, the Lindside soils are moderately well drained, and the Newark soils are somewhat poorly drained.

This association is better suited to trees than to cultivated crops because of the predominantly steep slopes, the common rock outcrops, and the shallowness of the soils. More than 60 percent of it is forested, mainly with oak, hickory, poplar, and redcedar. Some of the larger trees are used for lumber. Most of the acreage of bottom-land soils is in cultivation, and about half of the ridgetop acreage is used for corn, tobacco, small grain, and pasture. Farms are generally about 100 acres in size, but a few are larger. Only a small part of the acreage of most of the farms is suitable for cultivated crops. Many areas on side slopes were formerly cultivated, but most of these have been abandoned and have reverted to woodland. Some areas on side slopes are used for pasture, but much of the cleared land is idle.

Descriptions of the Soils

This section describes the soil series and mapping units of Metcalfe County, Kentucky. A general description of each soil series is given, and it is followed by brief descriptions of the mapping units in that series. For full information on any one mapping unit, it is necessary to read the description of the soil series as well as the description of the mapping unit.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of the description of each mapping unit are the capability unit and the woodland group in which the mapping unit has been placed. The page on which each capability unit and each woodland group is described can be found readily by referring to the "Guide to Mapping Units" at the back of the report.

The approximate acreage and proportionate extent of each mapping unit are given in table 1. Information about general patterns of soils in the county is given in the section "General Soil Map." Detailed technical descriptions of the soil series are given in the section "Genesis, Classification, and Morphology of the Soils." Many terms used in the soil descriptions and other sections of the report are defined in the Glossary.

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

Soil	Acres	Percent	Soil	Acres	Percent
Baxter cherty silt loam, 2 to 6 percent slopes	5,812	3.0	Cumberland cherty silt loam, 12 to 20 percent slopes, eroded	607	.3
Baxter cherty silt loam, 2 to 6 percent slopes, eroded	1,723	.9	Cumberland cherty silty clay, 12 to 20 percent slopes, severely eroded	367	.2
Baxter cherty silt loam, 6 to 12 percent slopes	1,721	.9	Dandridge and Westmoreland shaly silt loams, 12 to 20 percent slopes	2,843	1.5
Baxter cherty silt loam, 6 to 12 percent slopes, eroded	20,578	10.9	Dandridge and Westmoreland shaly silt loams, 20 to 50 percent slopes	31,708	16.7
Baxter cherty silt loam, 12 to 20 percent slopes	1,876	1.0	Dandridge and Westmoreland shaly silty clay loams, 12 to 20 percent slopes, severely eroded	745	.4
Baxter cherty silt loam, 12 to 20 percent slopes, eroded	14,357	7.6	Dandridge and Westmoreland shaly silty clay loams, 20 to 50 percent slopes, severely eroded	1,258	.7
Baxter cherty silt loam, 20 to 30 percent slopes	2,934	1.5	Dandridge and Westmoreland silt loams, 2 to 6 percent slopes	988	.5
Baxter cherty silt loam, 20 to 30 percent slopes, eroded	8,495	4.5	Dandridge and Westmoreland silt loams, 6 to 12 percent slopes	5,396	2.8
Baxter cherty silty clay loam, 6 to 12 percent slopes, severely eroded	539	.3	Dewey silt loam, 2 to 6 percent slopes	877	.5
Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded	948	.5	Dewey silt loam, 6 to 12 percent slopes, eroded	472	.3
Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded	615	.3	Dewey silt loam, 12 to 20 percent slopes, eroded	194	.1
Baxter-Talbott rocky silt loams, 6 to 12 percent slopes, eroded	524	.3	Dickson silt loam, 0 to 2 percent slopes	312	.2
Baxter-Talbott rocky silt loams, 12 to 20 percent slopes, eroded	1,099	.6	Dickson silt loam, 2 to 6 percent slopes	4,860	2.6
Baxter-Talbott rocky silt loams, 20 to 30 percent slopes, eroded	1,608	.9	Dickson silt loam, 2 to 6 percent slopes, eroded	242	.1
Baxter-Talbott rocky silty clay loams, 12 to 20 percent slopes, severely eroded	580	.3	Dickson silt loam, 6 to 12 percent slopes, eroded	491	.3
Bodine cherty silt loam, 12 to 20 percent slopes	1,014	.5	Elk silt loam, 2 to 6 percent slopes	933	.5
Bodine cherty silt loam, 20 to 35 percent slopes	2,886	1.5	Gullied land	1,576	.8
Caneyville rocky complex, 20 to 30 percent slopes	2,185	1.1	Humphreys cherty silt loam, 2 to 6 percent slopes	749	.4
Caneyville rocky complex, 20 to 30 percent slopes, severely eroded	513	.3	Humphreys cherty silt loam, 6 to 12 percent slopes	418	.2
Caneyville rocky complex, 30 to 50 percent slopes	1,201	.6	Humphreys cherty silt loam, 6 to 12 percent slopes, eroded	1,530	.8
Captina silt loam, 0 to 2 percent slopes	121	.1	Huntington gravelly silt loam	3,039	1.6
Captina silt loam, 2 to 6 percent slopes	2,495	1.3	Huntington silt loam	6,345	3.3
Christian clay loam, 6 to 20 percent slopes, severely eroded	208	.1	Landisburg cherty silt loam, 6 to 12 percent slopes, eroded	209	.1
Christian loam, 2 to 6 percent slopes	576	.3	Landisburg silt loam, 2 to 6 percent slopes	1,703	.9
Christian loam, 6 to 12 percent slopes	577	.3	Landisburg silt loam, 6 to 12 percent slopes, eroded	499	.3
Christian loam, 6 to 12 percent slopes, eroded	768	.4	Lindside silt loam	1,482	.8
Christian loam, 12 to 20 percent slopes, eroded	328	.2	Melvin silt loam	4,523	2.4
Christian rocky soils, 12 to 20 percent slopes	486	.3	Mountview silt loam, 2 to 6 percent slopes	2,003	1.1
Clarksville cherty silt loam, 2 to 6 percent slopes	1,593	.8	Mountview silt loam, 6 to 12 percent slopes, eroded	1,100	.6
Clarksville cherty silt loam, 6 to 12 percent slopes	1,062	.6	Muse silt loam, 6 to 12 percent slopes	221	.1
Clarksville cherty silt loam, 6 to 12 percent slopes, eroded	3,647	1.9	Newark silt loam	2,320	1.2
Clarksville cherty silt loam, 12 to 20 percent slopes, eroded	1,200	.6	Pembroke silt loam, 2 to 6 percent slopes	583	.3
Clarksville cherty silt loam, 20 to 30 percent slopes, eroded	438	.2	Pembroke silt loam, 6 to 12 percent slopes, eroded	192	.1
Crider silt loam, 2 to 6 percent slopes	7,750	4.1	Renox silt loam, 6 to 12 percent slopes	356	.2
Crider silt loam, 2 to 6 percent slopes, eroded	681	.4	Robertsville silt loam	926	.5
Crider silt loam, 6 to 12 percent slopes, eroded	3,532	1.9	Robinsonville fine sandy loam	1,260	.6
Cumberland cherty silt loam, 2 to 6 percent slopes	435	.2	Rock land	1,304	.7
Cumberland cherty silt loam, 2 to 6 percent slopes, eroded	486	.3	Sango silt loam, 0 to 2 percent slopes	480	.3
Cumberland cherty silt loam, 6 to 12 percent slopes, eroded	1,532	.8	Sango silt loam, 2 to 6 percent slopes	1,246	.7
			Taft silt loam	3,138	1.6
			Talbott silt loam, 6 to 12 percent slopes	350	.2
			Talbott silty clay loam, 6 to 12 percent slopes, eroded	472	.2
			Total	189,440	100.0

Baxter Series

The Baxter series consists of well-drained, gently sloping to moderately steep upland soils on ridgetops and side slopes. These soils developed in material weathered from cherty limestone. Chert fragments 1 to 5 inches in diameter occur throughout the soils and comprise 15 to 40 percent, by volume, of the soil mass. Sinkholes are common in some areas. Soils of this series are widely distributed in Metcalfe County and make up about 31.4 percent of the acreage.

Representative profile of Baxter cherty silt loam:

0 to 7 inches, brown, very friable cherty silt loam.
7 to 14 inches, brown or reddish-brown cherty silty clay loam; weak, blocky structure.
14 to 28 inches, yellowish-red to red, firm, sticky and plastic cherty silty clay loam or cherty silty clay; strong, blocky structure.
28 to 40 inches, variegated dark-red, reddish-brown, yellowish-brown, and yellow, sticky and plastic cherty silty clay or clay; blocky structure.
40 to 44 inches +, primarily a chert bed; interstices filled with red, gray, brown, and reddish-brown clay.

These soils are moderately high to moderately low in natural fertility, moderate or low in moisture-supplying capacity, and medium acid or strongly acid. Moisture and roots penetrate to a depth of about 4 feet in uneroded areas.

Most of the acreage is used for pasture and for cultivated crops. Some of the stronger slopes support stands of second-growth hardwoods, which are used for firewood and lumber.

The gently sloping and sloping areas are suited to most of the commonly grown crops. The stronger slopes and the severely eroded areas are not well suited to cultivated crops, but they are suited to pasture and wood crops.

Baxter cherty silt loam, 2 to 6 percent slopes (BaB).—This is a well-drained upland soil. It has a plow layer of brown, friable cherty silt loam. Its subsoil consists of yellowish-red or red cherty silty clay loam and grades, at a depth of about 28 inches, into mottled, sticky cherty silty clay. In a few places small pockets of sandy material occur in the subsoil.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. The subsoil has moderately slow permeability, and the root zone is deep. Tillage is somewhat difficult because of the chert fragments. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to hay and pasture (fig. 7) and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–11; woodland group 1)

Baxter cherty silt loam, 2 to 6 percent slopes, eroded (BaB2).—This is a well-drained upland soil. The plow layer consists of brown, friable cherty silt loam. In most places it is a mixture of original surface material and material from the subsoil. The subsoil consists of yellowish-red or red cherty silty clay loam and grades, at a depth of about 20 inches, into mottled, sticky cherty silty clay. There are a few galled spots where the subsoil is exposed. In some places small pockets of sandy material occur in the subsoil.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. It is low in organic-matter content. The subsoil has moderately slow permeability, and the root zone is deep. Tillage is somewhat difficult because of the chert fragments. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to hay and pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Management that will check runoff and control erosion is needed. (Capability unit IIe–11; woodland group 1)

Baxter cherty silt loam, 6 to 12 percent slopes (BaC).—This is a well-drained upland soil. It has a plow layer of brown, friable cherty silt loam. Its subsoil consists of yellowish-red or red cherty silty clay loam and grades, at a depth of about 28 inches, into mottled cherty silty clay. In some places small pockets of sandy material occur in the subsoil.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. The subsoil has moderately slow permeability, and the root zone is deep. Tillage is difficult because of the chert fragments. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–6; woodland group 1)

Baxter cherty silt loam, 6 to 12 percent slopes, eroded (BaC2).—This is a well-drained upland soil. In most places the plow layer is a mixture of original surface material and material from the subsoil. It consists of brown, friable cherty silt loam. The subsoil consists of yellowish-red or red cherty silty clay loam and grades, at a depth of about 18 inches, into mottled, sticky cherty silty clay. There are a few galled spots where the subsoil is exposed. In some places small pockets of sandy material occur in the subsoil.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. It is low in organic-matter content. The subsoil has moderately slow permeability, and the root zone is deep. Tillage is somewhat difficult because of the chert fragments. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. This soil needs management that will check runoff and control erosion. (Capability unit IIIe–6; woodland group 1)

Baxter cherty silt loam, 12 to 20 percent slopes (BaD).—This is a well-drained upland soil. It has a plow layer of brown, friable cherty silt loam. Its subsoil consists of yellowish-red or red cherty silty clay loam and grades, at a depth of about 20 inches, into mottled cherty silty clay. In some places small pockets of sandy material occur in the subsoil.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. The subsoil has moderately slow permea-

Figure 7.—**Dairy cattle grazing an area of Baxter cherty silt loam, 2 to 6 percent slopes. The pasture plants are mainly Kentucky 31 fescue and Korean lespedeza.**

bility, and the root zone is deep. Tillage is somewhat difficult because of the chert fragments and strong slopes. Crops respond well to fertilizer and lime.

This soil can be used for row crops occasionally in a long cropping sequence. It produces moderately high yields. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IVe–3; woodland group 1)

Baxter cherty silt loam, 12 to 20 percent slopes, eroded (BaD2).—This is a well-drained upland soil. The plow layer consists of brown, friable cherty silt loam. In most places it is a mixture of the original surface layer and material from the subsoil. Its subsoil consists of yellowish-red or red cherty silty clay loam. This grades, at a depth of about 16 inches, into mottled, sticky cherty silty clay. There are a few galled spots where the subsoil is exposed. In a few places small pockets of sandy material occur in the subsoil.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. It is low in organic-matter content. The subsoil is moderately permeable, and the root zone is moderately deep. Tillage is somewhat difficult because of the chert fragments and strong slopes. Crops respond well to fertilizer and lime.

This soil is well suited to pasture and very well suited to hardwood trees. It is not well suited to cultivated crops, but a row crop can be grown occasionally in a long cropping sequence. If cultivated crops are grown, there is an erosion hazard. Management that will check runoff and control erosion is needed. (Capability unit IVe–3; woodland group 1)

Baxter cherty silt loam, 20 to 30 percent slopes (BaE).—This is a well-drained upland soil. It has a surface layer of brown, friable cherty silt loam. Its subsoil consists of yellowish-red or red cherty silty clay loam and grades, at a depth of about 20 inches, into mottled cherty silty clay. In some places small pockets of sandy material occur in the subsoil.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. The subsoil has moderately slow permeability, and the root zone is deep. Tillage is difficult because of the chert fragments and the slope. Crops respond well to fertilizer and lime.

Because of the high hazard of erosion, this soil is not suited to row crops. It is better suited to hay and pasture crops and produces moderate yields of forage. It is very well suited to hardwood trees. Conservation practices that will check runoff and control erosion are needed. (Capability unit VIe–1; woodland group 1)

Baxter cherty silt loam, 20 to 30 percent slopes, eroded (BaE2).—This is a well-drained upland soil. The surface layer consists of brown, friable cherty silt loam. In most places it is a mixture of original surface material and material from the subsoil. The subsoil consists of

yellowish-red or red cherty silty clay loam and grades, at a depth of about 16 inches, into mottled, sticky cherty silty clay. There are a few galled spots where the subsoil is exposed. In a few places small pockets of sandy material occur in the subsoil. Included in the areas mapped are a few places where the surface layer is reddish brown.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. It is low in organic-matter content. The subsoil has moderately slow permeability, and the root zone is deep or moderately deep. Tillage is difficult because of the chert fragments and the slope.

Because of the high hazard of erosion, this soil is not suited to row crops. It is better suited to hay and pasture crops than to row crops and produces moderate yields of forage. It is very well suited to hardwood trees. Management that will check runoff and control erosion is needed. (Capability unit VIe–1; woodland group 1)

Baxter cherty silty clay loam, 6 to 12 percent slopes, severely eroded (BcC3).—This is a well-drained upland soil. Practically all of its original surface layer has been lost through accelerated erosion, and in places some of its subsoil. It now has a surface layer of yellowish-red, firm cherty silty clay loam, which grades at a depth of about 10 inches into mottled, sticky cherty silty clay. Shallow gullies are common. In places small pockets of sandy material occur in the surface layer. Included in the areas mapped are a few places where the surface layer is dark-red cherty silty clay.

This soil is moderately low in natural fertility and in moisture-supplying capacity and is medium acid or strongly acid. It is very low in organic-matter content. The subsoil has moderately slow permeability, and the root zone is moderately deep. Tillage is difficult because of the chert fragments and the fine texture of the surface layer. Crops respond fairly well to fertilizer and lime.

This soil is fairly well suited to pasture, upland oak, pine, and redcedar. It has severe limitations, however, and management problems are serious. If cultivated crops are grown, there is an erosion hazard. Management that will check runoff and control erosion is needed. (Capability unit IVe–11; woodland group 3)

Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded (BcD3).—This is a well-drained upland soil. Practically all of its original surface layer has been lost through accelerated erosion, and in places some of its subsoil. It now has a surface layer of yellowish-red, firm cherty silty clay loam, which grades at a depth of about 10 inches into mottled, sticky cherty silty clay. Shallow gullies are common. In places small pockets of sandy material occur in the surface layer.

This soil is moderately low in natural fertility, low in moisture-supplying capacity, and medium acid or strongly acid. It is very low in organic-matter content. The subsoil has moderately slow permeability and the root zone is moderately deep. Tillage is difficult because of the chert fragments, the slope, and the fine texture of the surface layer. Crops respond fairly well to fertilizer and lime.

This soil is not suited to cultivation because of the hazard of erosion. It is suited to upland oak, pine, and redcedar. It has severe limitations, however, and management problems are serious. If it is used for pasture, yields are moderately low. Management that will check runoff and control erosion is needed. (Capability unit VIe–2; woodland group 3)

Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded (BcE3).—This is a well-drained upland soil. Practically all of its original surface layer has been lost through accelerated erosion, and in places some of its subsoil. It now has a surface layer of yellowish-red, firm cherty silty clay loam, which grades at a depth of about 10 inches into mottled, sticky cherty silty clay. Shallow gullies are common. In places small pockets of sandy material occur in the surface layer. Included in the areas mapped are a few areas where the surface layer is red, sticky cherty silty clay.

This soil is moderately low in natural fertility, low in moisture-supplying capacity, and medium acid or strongly acid. It is very low in organic-matter content. The root zone is moderately deep. Tillage is difficult because of the chert fragments, the slope, and the fine texture of the surface layer.

Because of a high erosion hazard, this soil is not suited to cultivated crops. It is better suited to upland oak, pine, and redcedar. It has severe limitations, however, and management problems are serious. If used for pasture, yields are moderately low. Management that will check runoff and control erosion is needed. (Capability unit VIIe–1; woodland group 3)

Baxter-Talbott rocky silt loams, 6 to 12 percent slopes, eroded (BeC2).—This complex consists of well-drained, rocky Baxter and Talbott soils that occur together in such an intricate pattern that mapping them separately was not practical. It occurs on sloping ridgetops and moderately steep side slopes in upland areas that are underlain by argillaceous and cherty limestone. Massive limestone outcrops, roughly 100 to 300 feet apart, cover 2 to 10 percent of the surface. Chert fragments, 1 to 5 inches in diameter, occur throughout the Baxter soil and comprise 15 to 40 percent, by volume, of the soil mass. Chert is less common in the Talbott soil. Included in the areas mapped are a few areas where little or no erosion has occurred. In these places the surface layer consists of friable rocky silt loam and is about 8 inches thick. Also included are a few small, very rocky areas where outcrops of limestone cover 10 to 25 percent of the surface.

The soils in this complex are thinner than representative Baxter and Talbott soils. The surface layer consists of brown rocky silt loam. In most places it is a mixture of the original surface layer and material from the upper part of the subsoil. The subsoil consists of yellowish-red cherty silty clay and grades to variegated red, yellow, and brown cherty silty clay or clay. There are a few galled spots where the subsoil is exposed.

These soils are moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. They are low in organic-matter content. Permeability is moderately slow to slow in the subsoil. The root zone is moderately deep. Tillage is difficult because rock outcrops interfere with cultivation and because of the chert fragments in the Baxter soils. Crops respond well to fertilizer and lime.

Rockiness, combined with a moderate hazard of erosion, causes these soils to be unsuitable for cultivated crops. The soils are well suited to pasture and very well suited to upland oak, pine, and black locust. Management that will

check runoff and control erosion is needed. (Capability unit VIs–1; woodland group 1 for Baxter soils, woodland group 8 for Talbott soils)

Baxter-Talbott rocky silt loams, 12 to 20 percent slopes, eroded (BeD2).—The soils in this complex are similar to Baxter-Talbott rocky silt loams, 6 to 12 percent slopes, eroded, but their present surface layer is yellowish-brown rocky silt loam. The stronger slope is an additional hindrance to tillage.

Rockiness, combined with a moderate hazard of erosion, causes these soils to be unsuitable for cultivated crops. The soils are well suited to pasture and very well suited to upland oak, pine, and black locust. Conservation practices that will check runoff and control erosion are needed. (Capability unit VIs–1; woodland group 1 for Baxter soils, woodland group 8 for Talbott soils)

Baxter-Talbott rocky silt loams, 20 to 30 percent slopes, eroded (BeE2).—The soils in this complex are similar to Baxter-Talbott rocky silt loams, 6 to 12 percent slopes, eroded, but their present surface layer is yellowish-brown rocky silt loam. The stronger slope is an additional hindrance to tillage. Permeability is moderately slow in the subsoil.

These soils have severe limitations that make them unsuitable for cultivated crops. They are better suited to trees, short-season pasture, or wildlife habitats. They are well suited to upland oak, pine, black locust, and yellow-poplar. The erosion hazard is high, and conservation practices are needed that will check runoff and control erosion. The potential for production of wood crops is moderately high, and intensive management seems justifiable. (Capability unit VIIs–2; woodland group 1 for Baxter soils, woodland group 8 for Talbott soils)

Baxter-Talbott rocky silty clay loams, 12 to 20 percent slopes, severely eroded (BfD3).—The soils in this complex are similar to Baxter-Talbott rocky silty clay loams, 6 to 12 percent slopes, eroded, but they have lost practically all of their original surface layer and in places some of their subsoil through accelerated erosion. Their present surface layer is yellowish-red rocky silty clay loam or rocky silty clay that grades to variegated, sticky cherty silty clay or cherty clay. Shallow gullies are numerous.

Included in the areas mapped are a few areas where the slope is 6 to 12 percent and a few places where the slope is 20 to 30 percent. Also included are a few very rocky areas where outcrops of limestone cover 10 to 25 percent of the surface.

These soils are moderately low in natural fertility, low in moisture-supplying capacity, and medium acid to strongly acid. They are very low in organic-matter content. Permeability is moderately slow in the subsoil, and the root zone is moderately deep. Tillage is very difficult because of the rock outcrops, the chert fragments, the strong slopes, and the fine texture of the surface layer. Plants respond fairly well to fertilizer and lime.

These soils are suitable only for wood crops, wildlife habitats, and very short season pasture. They are fairly well suited to redcedar, but yields are normally low. The erosion hazard is high, and conservation practices that will check runoff and control erosion are needed. Potential productivity is too low to justify more than a limited management investment. (Capability unit VIIs–2; woodland group 3)

Bodine Series

The Bodine series consists of excessively drained, sloping to steep soils on uplands. These soils developed in highly weathered material derived from very cherty limestone. Chert fragments, 1 to 10 inches in diameter, occur throughout these soils. They make up 20 to 90 percent, by volume, of the soil mass and become more numerous with depth. Soils of this series are widely distributed in the central and southern parts of this county but make up only 2 percent of the acreage.

Representative profile of Bodine cherty silt loam:

0 to 7 inches, brown or pale-brown, friable cherty silt loam.
7 to 18 inches, yellowish-brown, friable cherty silt loam; weak, subangular blocky structure.
18 to 23 inches, variegated yellowish-brown, yellowish-red, and pale-brown very cherty silty clay loam; weak, blocky structure; chert fragments make up about 60 percent of this layer.
23 to 29 inches +, primarily a chert bed; interstices are filled with slightly sticky silty clay loam.

Bodine soils are low in natural fertility, moderately low in moisture-supply capacity, and strongly acid or very strongly acid. Roots penetrate to a depth of 10 inches to 3 feet.

Some of the acreage is used for pasture. Many of the steeper slopes support stands of second-growth hardwoods, which are used for firewood and lumber.

The strongly sloping areas are suited to pasture. The steep areas are not suited to pasture, but they have a moderately high potential for production of wood crops.

Bodine cherty silt loam, 12 to 20 percent slopes (BoD).—This is an excessively drained upland soil. It has a surface layer of pale-brown, friable cherty silt loam. Its subsoil consists of yellowish-brown, friable very cherty silt loam. This grades, at a depth of about 18 inches, into slightly sticky, very cherty silty clay loam. In some places small pockets of sandy material occur in the lower part of the subsoil.

This soil is low in natural fertility, moderately low in moisture-supplying capacity, and strongly acid or very strongly acid. It is low in organic-matter content. Permeability is moderately rapid in the subsoil. The root zone is shallow to moderately deep. Tillage is difficult because of the chert fragments and the slope. Crops respond fairly well to fertilizer and lime.

Because of the high erosion hazard, this soil is not suited to cultivated crops. It is suited to pasture. Plants that grow rapidly in spring and early in summer produce the largest yields. The potential for production of hardwood trees is moderately high. Management that will check runoff and control erosion is needed. (Capability unit VIs–3; woodland group 4)

Bodine cherty silt loam, 20 to 35 percent slopes (BoE).—This is an excessively drained upland soil. It has a surface layer of pale-brown, friable cherty silt loam. Its subsoil consists of yellowish-brown, friable very cherty silt loam and grades, at a depth of about 18 inches, into slightly sticky, very cherty silty clay loam. In some places small pockets of sandy material occur in the lower part of the subsoil. Included in the areas mapped are some areas where the slope is 35 to 50 percent.

This soil is low in natural fertility, moderately low in moisture-supplying capacity, and strongly acid or very strongly acid. It is low in organic-matter content. Per-

meability is moderately rapid in the subsoil. The root zone is shallow to moderately deep. Tillage is difficult because of the chert fragments and the slope. Forage crops respond fairly well to fertilizer and lime.

This soil is suited to hardwood trees and has a moderately high potential for production of wood crops. It is not suited to cultivated crops and is not well suited to pasture. The erosion hazard is high, and conservation practices that will check runoff and control erosion are needed. (Capability unit VIIs–2; woodland group 4)

Caneyville Series

The Caneyville series consists of well-drained, moderately steep and steep soils on uplands. These soils formed in material weathered mainly from limestone and sandstone but partly from shale. Normally, they have a rocky, brown or yellowish-brown surface layer that varies in texture, depending on the nature of the parent material. The subsoil is yellowish-red, plastic silty clay or sandy clay. Outcrops of limestone, 100 to 300 feet apart, cover 2 to 10 percent of the surface.

Soils of the Caneyville series are moderately extensive in the extreme eastern and northeastern parts of the county and of minor extent elsewhere. They make up about 2 percent of the acreage.

Representative profile of a Caneyville rocky loam:

0 to 7 inches, yellowish-brown, friable rocky loam.
7 to 28 inches, yellowish-red silty clay or sandy clay; blocky structure.
28 to 34 inches, strong-brown, sticky, variegated yellowish-red silty clay; blocky structure.
34 inches +, bedrock; limestone and sandstone.

These soils are moderate or moderately low in natural fertility, moderately low to very low in moisture-supplying capacity, and medium acid or strongly acid. Moisture and roots penetrate to a depth of 10 inches to 3 feet, depending on the pattern and volume of rocks in the soil mass.

Some of the acreage supports stands of second-growth hardwoods. Many areas that were formerly cultivated are now severely eroded and mostly idle. Some areas are used for pasture.

These soils are suited to short-season pasture (fig. 8) and have a fair potential for production of wood crops. They are not suited to cultivated crops.

Caneyville rocky complex, 20 to 30 percent slopes (CaE).—This complex consists of a Caneyville soil and rock outcrops. The soil in this complex has a surface layer of yellowish-brown, friable loam about 8 inches thick. The subsoil is yellowish-red silty clay or sandy clay. This grades at a depth of about 28 inches into strong-brown and yellowish-red, variegated silty clay. In many places sandy material occurs in pockets or is scattered throughout the soil mass. Included in the areas mapped are some eroded areas, which have a slightly thinner and redder surface layer. Also included are a few very rocky areas, where outcrops cover 10 to 25 percent of the surface.

The Caneyville soil in this complex is moderate in natural fertility, moderately low in moisture-supplying capacity, and medium acid or strongly acid. Permeability is moderately slow in the subsoil. The root zone is shallow to moderately deep. Tillage is difficult because of the slope and the rock outcrops. Plants respond well to fertilizer and lime.

Figure 8.—**Sericea lespedeza, Korean lespedeza, and red clover growing on Caneyville soils. Tree sprouts and weeds are difficult to control in these areas.**

This soil is suited to short-season pasture. It has a fair potential for production of wood crops. Because of a high erosion hazard, conservation practices that will check runoff and control erosion are needed. (Capability unit VIIs–2; woodland group 2)

Caneyville rocky complex, 20 to 30 percent slopes, severely eroded (CaE3).—This complex consists of a Caneyville soil and rock outcrops. Practically all of the original surface layer of the soil has been lost through erosion, and in places some of the subsoil. The soil now has a surface layer of yellowish-red, sticky and plastic silty clay or sandy clay. This grades at a depth of about 20 inches into strong-brown, variegated silty clay. Shallow gullies are common. In many places sandy material occurs in pockets or is scattered throughout the soil mass. Included in the areas mapped are a few places where the slope is more than 30 percent and a few where rock outcrops cover 10 to 25 percent of the surface.

The Caneyville soil in this complex is moderately low in natural fertility, very low in moisture-supplying capacity, and medium acid or strongly acid. It is very low in organic-matter content. Permeability is moderately slow in the subsoil. The root zone is mostly shallow. Tillage is not feasible, because of the slope, the fine texture of the surface layer, and the rock outcrops. Plants respond fairly well to fertilizer and lime.

This soil is not suited to cultivated crops but is suited to limited use as pasture. It is suited to redcedar, but yields are normally low. Its low potential productivity does not justify high-level management. (Capability unit VIIs–2; woodland group 3)

Caneyville rocky complex, 30 to 50 percent slopes (CaF).—This complex consists of a Caneyville soil and rock outcrops. The soil now has a surface layer of yellowish-brown, friable rocky loam about 8 inches thick. Its subsoil is yellowish-red silty clay or sandy clay. This grades at a depth of about 28 inches into strong-brown and yellowish-red, variegated silty clay. In many places sandy material occurs in pockets or is scattered throughout the soil mass. Included in the areas mapped are some eroded spots, which have a slightly thinner and redder surface layer. Also included are a few areas where outcrops cover 10 to 25 percent of the surface.

The Caneyville soil in this complex is moderate in natural fertility, low in moisture-supplying capacity, and medium acid or strongly acid. Permeability is moderately slow in the subsoil. The root zone is shallow to moderately deep. Tillage is difficult because of the slope and the rock outcrops. Plants respond well to fertilizer and lime.

Figure 9.—**Burley tobacco growing on Captina silt loam. This soil has a fragipan, which retards the penetration of moisture and may reduce crop yields in dry periods.**

This soil is suited to upland oak and redcedar, and yields are generally fair. It is also suitable as a habitat for wildlife and for use as short-season pasture. The erosion hazard is very high. The potential productivity is fair and justifies medium-level management. (Capability unit VIIs–2; woodland group 2)

Captina Series

The Captina series consists of moderately well drained, level or gently sloping soils on stream terraces. These soils developed in old alluvium washed principally from soils of limestone origin but partly from soils of shale and sandstone origin. In places the parent material had a loess component. These soils normally have a plow layer of brown silt loam and a subsoil of yellowish-brown silt loam or silty clay loam, which grades into a well-developed, dense, compact layer. Soils of this series are widely distributed in Metcalfe County, but they make up only about 1.4 percent of the acreage.

Representative profile of a Captina silt loam:

0 to 8 inches, brown, friable silt loam.
8 to 24 inches, yellowish-brown, friable silt loam or silty clay loam; blocky structure.
24 to 42 inches, mottled brown, gray, and yellow, firm silty clay loam; blocky structure; compact and brittle.
42 to 46 inches +, partly weathered old alluvium consisting of stratified beds of silt, clay, sand, and waterworn pebbles.

These soils are moderately high in natural fertility and in moisture-supply capacity and are medium acid to very strongly acid. Moisture and roots penetrate to a depth of about 2 feet; further penetration is retarded by the dense layer.

Most of the acreage is used for pasture and for cultivated crops. Some small areas are used for yellow-poplar and upland oak.

These soil are suited to most of the crops commonly grown in the county. They have a moderately high potential for production of wood crops.

Captina silt loam, 0 to 2 percent slopes (CbA).—This is a moderately well drained soil on stream terraces. It has a plow layer of brown, friable silt loam. Its subsoil consists of yellowish-brown silty clay loam and grades, at a depth of 20 to 30 inches, into a firm, compact and brittle layer.

This soil is moderately high in natural fertility and in moisture-supplying capacity and is medium acid to very strongly acid. It is easy to work and to keep in good tilth. The subsoil is moderately permeable above the compact layer, and the root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the moderately deep rooted crops commonly grown in the county (fig. 9). It is suited to pasture and very well suited to yellow-poplar and upland oak. There is a slight hazard of wetness, and management practices that will drain off excess water are needed. (Capability unit IIw–1; woodland group 6)

Captina silt loam, 2 to 6 percent slopes (CbB).—This is a moderately well drained soil on stream terraces. It has a plow layer of brown, friable silt loam. Its subsoil consists of yellowish-brown silty clay loam and grades, at a depth of 20 to 30 inches, into a firm, compact and brittle layer. Included in the areas mapped are some eroded

tracts, which have a slightly thinner and yellower surface layer.

This soil is moderately high in natural fertility and in moisture-supplying capacity and is medium acid to very strongly acid. It is easy to work and to keep in good tilth. The subsoil is moderately permeable above the dense layer, and the root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the moderately deep rooted crops commonly grown in the county. It is suited to pasture and very well suited to yellow-poplar and upland oak. If cultivated crops are grown, there is an erosion hazard. Conservation practices that check runoff and control erosion are needed. (Capability unit IIe–10; woodland group 6)

Christian Series

The Christian series consists of well-drained, gently sloping to moderately steep soils on ridgetops and side slopes on uplands. These soils developed in residuum weathered from limestone, from sandstone, and, to a lesser extent, from shale. Soils of this series are widely distributed in Metcalfe County, but they make up only about 1.6 percent of the acreage.

Representative profile of Christian loam:

0 to 8 inches, brown, friable loam.
8 to 14 inches, yellowish-brown, friable loam; granular structure.
14 to 32 inches, red, firm, sticky silty clay; blocky structure; a few small pockets of sand.
32 to 51 inches, red, firm silty clay loam; blocky structure; pockets of sandy material are common.
51 to 56 inches +, red, highly weathered sandstone.

These soils are moderately high to moderately low in natural fertility, moderately high or moderate in moisture-supplying capacity, and medium acid or strongly acid. Moisture and roots penetrate to a depth ranging from 20 inches to 4 feet or more.

Most of the acreage is used for cultivated crops and for pasture. Some of the strong slopes support stands of second-growth hardwoods, which are used for firewood and lumber.

The gently sloping and sloping areas are suited to all of the crops commonly grown in this area. The stronger slopes are not well suited to cultivated crops, but they are suitable for pasture and have a very high potential for production of wood crops.

Christian clay loam, 6 to 20 percent slopes, severely eroded (CcD3).—This is a well-drained upland soil. Practically all of its original surface layer has been lost through erosion, and in places some of its subsoil. It now has a surface layer of yellowish-red clay loam, which grades at a depth of about 9 inches into red, sticky silty clay. Shallow gullies are common. In some places there are a few small fragments of sandstone on the surface and within the soil. These fragments are more numerous with depth.

This soil is moderately low in natural fertility, moderately high in moisture-supplying capacity, and strongly acid. It is very low in organic-matter content. The subsoil has moderately slow permeability, and the root zone is deep. Tillage is somewhat difficult because the surface layer is fine textured. Crops respond fairly well to fertilizer and lime.

This soil is well suited to pasture and trees, and it provides a good habitat for wildlife. Because of a high erosion hazard, it is not suited to row crops. It needs management that will check runoff and control erosion. (Capability unit VIe–2; woodland group 3)

Christian loam, 2 to 6 percent slopes (CdB).—This is a well-drained upland soil. It has a plow layer of brown, friable loam. Its subsoil consists of red silty clay and grades, at a depth of about 32 inches, into reddish silty clay loam. In some places there are a few small fragments of sandstone in the subsoil. These fragments are more numerous with depth. Included in the areas mapped are some eroded spots, which have a slightly thinner and yellower surface layer.

This soil is moderately high in natural fertility and in moisture-supplying capacity and is medium acid or strongly acid. It is easy to work and to keep in good tilth. The subsoil is moderately slowly permeable, and the root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–1; woodland group 1)

Christian loam, 6 to 12 percent slopes (CdC).—This is a well-drained upland soil. It has a plow layer of brown, friable loam. Its subsoil consists of red silty clay and grades, at a depth of about 32 inches, into reddish silty clay loam. In some places there are a few small fragments of sandstone in the subsoil. These fragments are more numerous with depth.

This soil is moderately high in natural fertility and in moisture-supplying capacity and is medium acid or strongly acid. It is easy to work and to keep in good tilth. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–2; woodland group 1)

Christian loam, 6 to 12 percent slopes, eroded (CdC2).—This is a well-drained upland soil. It has a plow layer of brown, friable loam. In most places this layer consists of material from the original surface layer mixed with material from the subsoil. The subsoil consists of red silty clay and grades, at a depth of about 28 inches, into reddish silty clay loam. In some places there are a few small fragments of sandstone in the subsoil. These fragments are more numerous with depth. There are a few galled spots where the subsoil is exposed.

This soil is moderately high in natural fertility and in moisture-supplying capacity and is medium acid or strongly acid. It is low in organic-matter content. It is easy to work and to keep in good tilth. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–2; woodland group 1)

Christian loam, 12 to 20 percent slopes, eroded (CdD2).—This is a well-drained upland soil. It has a plow layer of brown, friable loam. In most places this layer consists of material from the original surface layer mixed with material from the subsoil. The subsoil consists of red silty clay and grades, at a depth of about 28 inches, into reddish silty clay loam. In some places there are a few small fragments of sandstone in the subsoil. These fragments are more numerous with depth. Included in the areas mapped are a few spots that are less eroded; these spots have a slightly thicker and browner surface layer. Also included are a few areas that have a surface layer of fine sandy loam.

This soil is moderately high in natural fertility and in moisture-supplying capacity and is medium acid or strongly acid. It is low in organic-matter content. Permeability is moderately slow in the subsoil. The root zone is deep. Tillage is somewhat difficult because of the slope. Crops respond well to fertilizer and lime.

This soil is well suited to pasture and very well suited to wood crops. It is not well suited to row crops, but a row crop can be grown occasionally in a long cropping sequence. If cultivated crops are grown, there is an erosion hazard. Management that will check runoff and control erosion is needed. (Capability unit IVe–3; woodland group 1)

Christian rocky soils, 12 to 20 percent slopes (CeD).—These are well-drained rocky soils on uplands, mainly in the northeastern part of the county. They have a surface layer of loam, silt loam, or fine sandy loam. Their color is generally brown. Both the texture and the color vary from place to place, according to the kind and color of the parent material. The upper part of the subsoil is strong-brown sandy clay loam. This grades into yellowish-red firm silty clay at a depth of about 13 inches. In places the color of the subsoil is red or reddish brown. Depth to bedrock is 3 feet or more in most places, but outcrops of limestone, roughly 100 to 300 feet apart, cover 2 to 10 percent of the surface.

Included in the areas mapped are a few small eroded spots, which have a slightly thinner and redder surface layer. Also included are a few severely eroded areas, where the surface layer is yellowish-red sticky clay loam, and a few places where the slope is 6 to 12 percent.

These soils are moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. Tillage is somewhat difficult because of the slope and the rock outcrops. The subsoil is moderately slowly permeable, and the root zone is moderately deep or deep. Plants respond well to fertilizer and lime.

These soils are well suited to pasture and have a moderately high potential for production of wood crops. They are not suited to cultivated crops. There is a high erosion hazard, and conservation practices that will check runoff and control erosion are needed. (Capability unit VIs–1; woodland group 2)

Clarksville Series

The Clarksville series consists of well-drained, gently sloping to moderately steep soils on ridgetops and side slopes in the uplands. These soils developed in material weathered from cherty limestone. Normally, they have a plow layer of brown cherty silt loam and a subsoil of yellowish-brown to strong-brown cherty silt loam. Chert fragments, 1 to 5 inches in diameter, occur throughout the soils and make up 15 to 40 percent, by volume, of the soil mass. Soils of this series are widely distributed in the central and southern parts of this county and occupy minor acreages in other parts. They make up about 4.1 percent of the total acreage.

Representative profile of Clarksville cherty silt loam:

0 to 5 inches, yellowish-brown, very friable cherty silt loam.
5 to 12 inches, yellowish-brown, friable cherty silt loam; weak, blocky structure.
12 to 24 inches, yellowish-brown or strong-brown, firm cherty heavy silt loam; moderate, blocky structure.
24 to 38 inches +, strong-brown, firm cherty silty clay loam, variegated with brownish gray; blocky structure; about 40 percent chert fragments.

These soils are moderate or moderately low in natural fertility and in moisture-supplying capacity and are medium acid or strongly acid. Moisture and roots penetrate to a depth ranging from 20 inches to about 3 feet.

Most of the acreage has been cleared. The more nearly level or rolling areas are used for pasture and for cultivated crops. Some of the stronger slopes support stands of second-growth hardwoods, which are used for firewood and lumber.

The gently sloping and sloping areas are suited to most of the commonly grown crops. The stronger slopes are not well suited to cultivated crops, but they are suitable for pasture and have a high potential for production of wood crops.

Clarksville cherty silt loam, 2 to 6 percent slopes (CkB).—This is a well-drained upland soil. It has a plow layer of brown, friable cherty silt loam. The upper part of its subsoil is yellowish-brown cherty silt loam. This grades, at a depth of about 12 inches, into strong-brown cherty silt loam. Included in the areas mapped are a few areas that have a slightly thinner and yellower surface layer. In these places original surface material has been mixed with material from the subsoil. Also included are a few areas where chert fragments make up considerably more than 15 to 40 percent of the soil mass.

This soil is moderate in natural fertility and in moisture-supplying capacity and is medium acid or strongly acid. The organic-matter content is low. Tillage is somewhat difficult because of the chert fragments. Permeability is moderately rapid in the subsoil. The root zone is moderately deep or deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to hay and pasture and to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–11; woodland group 1)

Clarksville cherty silt loam, 6 to 12 percent slopes (CkC).—This is a well-drained upland soil. It has a plow layer of brown, friable cherty silt loam. The upper part of its subsoil is yellowish-brown cherty silt loam. This grades, at a depth of about 12 inches, into strong-brown cherty silt loam. Included in the areas mapped are small areas where the surface layer is pale-brown cherty silt loam. In these places the solum is slightly thinner, and the content of chert is somewhat greater.

This soil is moderate in natural fertility and in moisture-supplying capacity and is medium acid or strongly acid. The organic-matter content is low. Tillage is somewhat difficult because of the chert fragments. Permeability is moderately rapid in the subsoil. The root zone is moderately deep or deep. Crops respond well to fertilizer and lime.

This soil is suited to all the commonly grown crops. It is well suited to pasture and to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe-6; woodland group 1)

Clarksville cherty silt loam, 6 to 12 percent slopes, eroded (CkC2).—This is a well-drained upland soil. In most places original surface material has been mixed with material from the subsoil, and the present plow layer consists of yellowish-brown, friable cherty silt loam. The subsoil consists of strong-brown cherty silt loam grading, at a depth of about 20 inches, into firm cherty silty clay loam. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are small spots that are shallower over chert beds and have slightly more chert in the subsoil. Some of these included areas have a surface layer of strong-brown cherty silt loam.

This soil is moderate in natural fertility, moderately low in moisture-supplying capacity, and medium acid or strongly acid. The organic-matter content is low. Tillage is difficult because of the chert fragments. Permeability is moderately rapid in the subsoil. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is well suited to pasture and to hardwood trees. It is suited to most of the commonly grown crops, but plants that grow rapidly in spring and early in summer produce the largest yields. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe-6; woodland group 1)

Clarksville cherty silt loam, 12 to 20 percent slopes, eroded (CkD2).—This is a well-drained upland soil. In most places the original surface layer has been mixed with material from the subsoil, and the present plow layer consists of yellowish-brown, friable cherty silt loam. The subsoil consists of strong-brown cherty silt loam grading, at a depth of about 20 inches, into firm cherty silty clay loam. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are some places where little or no erosion has taken place and in these places the plow layer is brown. Also included are a few areas where the surface layer is strong-brown cherty silt loam.

This soil is moderate in natural fertility, moderately low in moisture-supplying capacity, and medium acid or strongly acid. The organic-matter content is low. Tillage is difficult because of the slope and the chert fragments. Permeability is moderately rapid in the subsoil. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is well suited to pasture and to hardwood trees. It is not well suited to cultivated crops. Row crops can be grown occasionally in a long cropping sequence, but yields are moderately low. Plants that make rapid growth in spring and early in summer are best suited. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IVe–3; woodland group 1)

Clarksville cherty silt loam, 20 to 30 percent slopes, eroded (CkE2).—This is a well-drained upland soil. In most places original surface material has been mixed with material from the subsoil, and the present surface layer consists of yellowish-brown, friable cherty silt loam. The subsoil consists of strong-brown cherty silt loam grading, at a depth of about 20 inches, into firm cherty silty clay loam. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are some less eroded areas. In these places the plow layer is brown, friable cherty silt loam. Also included are a few areas where the surface layer is strong-brown cherty silt loam.

This soil is moderately low in natural fertility and in moisture-supplying capacity and is medium acid or strongly acid. The organic-matter content is low. Tillage is difficult because of the slope and the chert fragments. Permeability is moderately rapid in the subsoil. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is well suited to hardwood trees and moderately well suited to pasture. It is too steep for row crops. Pasture plants that grow rapidly in spring and early in summer are best. Because of a high erosion hazard, conservation practices that will check runoff and control erosion are needed. (Capability unit VIe-1; woodland group 1)

Crider Series

The Crider series consists of deep, well-drained, gently sloping or sloping soils on uplands. The upper part of these soils formed in a thin mantle of loess, and the lower part formed in residuum from limestone. The surface layer consists of brown silt loam, and the subsoil is yellowish red. Soils of this series are widely distributed in the county and make up 6.4 percent of the acreage.

Representative profile of Crider silt loam:

0 to 8 inches, brown, very friable silt loam.
8 to 14 inches, strong-brown, friable silt loam; weak, blocky structure.
14 to 24 inches, yellowish-red, firm silty clay loam; moderate, blocky structure.
24 to 37 inches, red or yellowish-red, firm silty clay loam; moderate, blocky structure.
37 to 40 inches +, variegated red and yellowish-brown, firm silty clay loam; moderate, blocky structure; small fragments of chert are common.

These soils are moderately high in natural fertility, very high in moisture-supplying capacity, and medium acid or strongly acid. Moisture and roots penetrate to a depth of 4 feet or more.

Most of the acreage is used for cultivated crops. Yields of corn, burley tobacco, hay, small grain, and pasture are satisfactory. The potential for production of wood crops is high.

Crider silt loam, 2 to 6 percent slopes (CrB).—This is a deep, well-drained soil of the uplands. It has a plow layer of brown, friable silt loam. The upper part of its subsoil is strong-brown, friable silt loam. This grades, at a depth of about 14 inches, into yellowish-red silty clay loam. Included with this soil are a few areas that have a thin, weak fragipan in the subsoil.

This soil is moderately high in natural fertility, very high in moisture-supplying capacity, and medium acid or strongly acid. It is easy to work and to keep in good

tilth. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is well suited to row crops, pasture, and wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–1; woodland group 1)

Crider silt loam, 2 to 6 percent slopes, eroded (CrB2).—This is a deep, well-drained soil of the uplands. In most places original surface material has been mixed with material from the subsoil, and the present plow layer is brown silt loam. The upper part of the subsoil is strong-brown silt loam. This grades, at a depth of about 10 inches, into yellowish-red silty clay loam. There are a few galled spots where the subsoil is exposed and a few places that have a thin, weak fragipan in the subsoil.

This soil is moderately high in natural fertility, very high in moisture-supplying capacity, and medium acid or strongly acid. It is easy to work and to keep in good tilth. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is well suited to row crops, pasture, and wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices are needed that will check runoff and control erosion. (Capability unit IIe–1; woodland group 1)

Crider silt loam, 6 to 12 percent slopes, eroded (CrC2).—This is a deep, well-drained soil of the uplands. In most places original surface material has been mixed with material from the subsoil, and the present plow layer is brown silt loam. The upper part of the subsoil is strong-brown silt loam. This grades, at a depth of about 10 inches, into yellowish-red silty clay loam. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are some less eroded areas. In these places the surface layer is friable silt loam and is about 8 inches thick. Also included are a few areas where the surface layer is yellowish-red silty clay loam.

This soil is moderately high in natural fertility, very high in moisture-supplying capacity, and medium acid or strongly acid. It is easy to work and to keep in good tilth. The subsoil is moderately slowly permeable, and the root zone is deep. Crops respond well to fertilizer and lime.

This soil is well suited to row crops, pasture, and wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices are needed that will check runoff and control erosion. (Capability unit IIIe–2; woodland group 1)

Cumberland Series

The Cumberland series consists of deep, well-drained, gently sloping to moderately steep soils on uplands. These soils developed in material weathered from cherty limestone. Chert fragments, 1 to 5 inches in diameter, occur throughout the soils and make up 15 to 40 percent, by volume, of the soil mass. Sinkholes are common. Soils of this series occur principally in the extreme northwestern part of the county and make up 1.8 percent of the acreage.

Representative profile of a Cumberland cherty silt loam:

0 to 7 inches, dark-brown, friable cherty silt loam.
7 to 11 inches, red, firm cherty silty clay loam; moderate, blocky structure.
11 to 46 inches, dark-red, firm, sticky and plastic cherty silty clay or clay; strong, subangular blocky structure.
46 to 50 inches +, dusky-red, very firm, sticky cherty clay, with variegations of red.

These soils are moderate or high in natural fertility, moderate or moderately low in moisture-supplying capacity, and slightly acid to very strongly acid. Moisture and roots penetrate to a depth of more than 4 feet.

Most of the acreage is used for pasture and for cultivated crops. Some of the stronger slopes support stands of second-growth hardwoods, which are used for firewood and lumber.

The gently sloping and sloping areas are suited to most of the commonly grown crops. The moderately steep areas are well suited to pasture and have a high potential for production of wood crops, but they are not well suited to cultivated crops.

Cumberland cherty silt loam, 2 to 6 percent slopes (CuB).—This is a deep, well-drained soil on uplands. It has a plow layer of dark-brown, friable cherty silt loam. The upper part of the subsoil is red cherty silty clay loam. This grades, at a depth of about 11 inches, into dark-red sticky cherty clay. Included in the areas mapped are a few small areas where the surface layer is brown cherty silt loam, about 8 inches thick, and the subsoil is less clayey. Also included are areas where the soil is browner and less cherty.

This soil is high in natural fertility, moderate in moisture-supplying capacity, and slightly acid to strongly acid. Tillage is somewhat difficult because of the chert fragments. The subsoil is moderately permeable, and the root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to hay and pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–11; woodland group 1)

Cumberland cherty silt loam, 2 to 6 percent slopes, eroded (CuB2).—This is a deep, well-drained soil on uplands. In most places original surface material has been mixed with material from the subsoil, and the present plow layer is reddish-brown, slightly firm cherty silt loam. This grades, at a depth of about 9 inches, into red, sticky silty clay. The subsoil is exposed in a few galled spots. Included in the areas mapped are a few small areas where the surface layer is brown cherty silt loam, about 8 inches thick, and the subsoil is less reddish and less clayey. Also included are areas where the soil is browner and less cherty.

This soil is high in natural fertility, moderate in moisture-supplying capacity, and slightly acid to strongly acid. The organic-matter content is low. Tillage is somewhat difficult because of the chert fragments. The subsoil is moderately permeable, and the root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to hay and pasture and to hardwood trees. The hazard of erosion is moderate. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–11; woodland group 1)

Cumberland cherty silt loam, 6 to 12 percent slopes, eroded (CuC2).—This is a deep, well-drained soil on up-

lands. In most places original surface material has been mixed with material from the subsoil, and the present plow layer is reddish-brown, slightly firm cherty silt loam. This grades, at a depth of about 9 inches, into red, sticky silty clay. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are a few uneroded areas where the surface layer is dark-brown, friable cherty silt loam and is about 8 inches thick. Also included are a few small areas where the surface layer is brown cherty silt loam and the subsoil is less reddish and less clayey.

This soil is high in natural fertility, moderate in moisture-supplying capacity, and slightly acid to strongly acid. The organic-matter content is low. Tillage is somewhat difficult because of the chert fragments and the sloping rims of the sinkholes. The subsoil is moderately permeable, and the root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to hay and pasture and to hardwood trees. Erosion is a hazard, and conservation practices that will check runoff are needed. (Capability unit IIIe–6; woodland group 1)

Cumberland cherty silt loam, 12 to 20 percent slopes, eroded (CuD2).—This is a deep, well-drained upland soil. In most places the original surface layer has been mixed with material from the subsoil, and the present surface layer is reddish-brown, slightly firm cherty silt loam. This grades, at a depth of about 9 inches, into red, sticky silty clay. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are some spots where little or no erosion has taken place. In these places the surface layer is dark-brown, friable cherty silt loam and is about 8 inches thick. Also included are a few small areas where the surface layer is brown cherty silt loam and the subsoil is less reddish and less clayey.

This soil is high in natural fertility, moderate in moisture-supplying capacity, and slightly acid to strongly acid. The organic-matter content is low. Tillage is difficult because of the chert fragments and because of the strong slope, especially around sinkholes. The subsoil is moderately permeable, and the root zone is deep. Crops respond well to fertilizer and lime.

This soil is well suited to pasture and very well suited to hardwood trees. A row crop can be grown occasionally in a long cropping sequence. Yields of most crops are moderately high. Erosion is a hazard, and conservation practices that will check runoff are needed. (Capability unit IVe–3; woodland group 1)

Cumberland cherty silty clay, 12 to 20 percent slopes, severely eroded (CvD3).—This is a deep, well-drained soil on uplands. Practically all of its original surface layer has been lost through accelerated erosion, and in places some of its subsoil. It now has a surface layer of red, sticky cherty silty clay. This grades, at a depth of about 6 inches, into dark-red, firm, sticky cherty clay. Shallow gullies are common. Included in the areas mapped are a few small areas where the subsoil is less reddish and less clayey.

This soil is moderate in natural fertility, moderately low in moisture-supplying capacity, and slightly acid to strongly acid. The organic-matter content is very low. Tillage is difficult because of the chert, the sloping rims of the sinkholes, the fine texture of the surface layer, and the strong slope. The subsoil is moderately permeable, and the root zone is deep. Crops respond well to fertilizer and lime.

Because the hazard of erosion is high, this soil is not suited to cultivated crops. It is fairly well suited to upland oak, pine, and redcedar. If it is used for pasture, yields of forage are moderately low. It has severe limitations, and management problems are serious. Conservation practices that will check runoff and control erosion are needed. (Capability unit VIe–2; woodland group 3)

Dandridge Series

The Dandridge series consists of somewhat excessively drained, gently sloping to steep soils on ridges and side slopes on uplands. These soils developed in residuum from calcareous shale and shaly limestone. In places there are outcrops of limestone. In Metcalfe County, Dandridge soils occur in an irregular pattern with Westmoreland soils and are mapped with them in undifferentiated mapping units. They are shallower than Westmoreland soils and have slightly weaker soil development. These two soils are widely distributed in this county. Together, they make up 22.6 percent of the acreage. The mapping units may consist of both soils in varying proportions, or they may consist of either soil without the other. More than 65 percent of their combined acreage is moderately steep or steep.

Representative profile of a Dandridge shaly silt loam:

0 to 7 inches, very dark grayish-brown, friable shaly silt loam.
7 to 15 inches, yellowish-brown shaly silty clay loam; blocky structure.
15 to 19 inches, light olive-brown, shaly, heavy silty clay loam; blocky structure.
19 inches +, calcareous limestone bedrock.

These soils are moderate or moderately low in natural fertility, moderately low to very low in moisture-supplying capacity, and slightly acid or neutral. Most of the acreage is used for wood crops, mainly oak, hickory, and redcedar. The steeper areas are not suited to cultivated crops. The cleared areas are used mainly for hay and short-season pasture.

Dandridge and Westmoreland shaly silt loams, 12 to 20 percent slopes (DaD).—These are somewhat excessively drained upland soils. The plow layer consists of dark grayish-brown, friable shaly silt loam. The subsoil is yellowish-brown shaly silty clay loam in the upper part and grades, at a depth of about 12 inches, into olive-brown or brownish-yellow shaly silty clay loam. Thin fragments of shale, one-fourth of an inch to an inch in length, make up 10 to 40 percent, by volume, of the soil mass. Included in the areas mapped are a few moderately eroded areas; these have a slightly thinner and yellower surface layer consisting, in most places, of a mixture of original surface material and material from the upper part of the subsoil.

These soils are moderately low in natural fertility, low in moisture-supplying capacity, and slightly acid or neutral. Their subsoil is moderately permeable, and their root zone is shallow to moderately deep. Tillage is somewhat difficult because of the shale fragments. Crops respond well to fertilizer.

These soils are not suited to row crops. They are fairly well suited to hay and pasture and to hardwood trees.

Pasture plants that make rapid growth in spring and early in summer produce the largest yields. There is a high erosion hazard, and conservation practices that will check runoff and control erosion are needed. (Capability unit VIe–8; woodland group 2)

Dandridge and Westmoreland shaly silt loams, 20 to 50 percent slopes (DaF).—These are somewhat excessively drained upland soils. The surface layer consists of dark grayish-brown shaly silt loam. The subsoil is yellowish-brown shaly silty clay loam in the upper part and grades, at a depth of about 10 to 12 inches, into brown silty clay loam. Thin fragments of shale, one-fourth of an inch to an inch in length, make up 10 to 40 percent, by volume, of the soil mass. Included in the areas mapped are a few moderately eroded areas, which have a slightly thinner and yellower surface layer.

These soils are moderately low in natural fertility, low or very low in moisture-supplying capacity, and slightly acid or neutral. They are moderately permeable. The root zone is mostly shallow. Pasture plants respond fairly well to fertilizer.

These soils are not suited to row crops. They are suited to woodland and to wildlife. The potential for production of hardwoods is fair. Some of the moderately steep areas can be used as short-season pasture, but the yield of forage is low. Plants that grow rapidly in spring and early in summer provide the most forage. (Capability unit VIIe–2; woodland group 2)

Dandridge and Westmoreland shaly silty clay loams, 12 to 20 percent slopes, severely eroded (DbD3).—These are somewhat excessively drained upland soils. Practically all of their original surface layer has been lost through accelerated erosion, and in places some of their subsoil. They now have a surface layer of yellowish-brown shaly silty clay loam, which grades, at a depth of about 6 inches, into brown shaly silty clay loam. Shallow gullies are common. Included in the areas mapped are some areas where the slope is 6 to 12 percent.

These soils are low in natural fertility, very low in moisture-supplying capacity, and slightly acid or neutral. Their root zone is shallow. Crops respond fairly well to fertilizer.

These soils are suitable for the production of redcedar and for use as a habitat for wildlife. The erosion hazard is very high. The potential productivity is low and justifies only a limited investment in management. (Capability unit VIIe–2; woodland group 3)

Dandridge and Westmoreland shaly silty clay loams, 20 to 50 percent slopes, severely eroded (DbF3).—These are somewhat excessively drained upland soils. Practically all of their original surface layer has been lost through accelerated erosion, and in places some of their subsoil. They now have a surface layer of yellowish-brown shaly silty clay loam, which grades, at a depth of about 8 inches into brown shaly silty clay loam. Shallow gullies are common.

These soils are low in natural fertility, very low in moisture-supplying capacity, and slightly acid or neutral. Their root zone is very shallow.

These soils are suitable for the production of redcedar and for use as a habitat for wildlife. The erosion hazard is very high. (Capability unit VIIe–2; woodland group 3)

Dandridge and Westmoreland silt loams, 2 to 6 percent slopes (DcB).—These are somewhat excessively drained upland soils. The plow layer consists of dark grayish-brown, friable silt loam. The subsoil is yellowish-brown shaly silty clay loam in the upper part and grades, at a depth of about 14 inches, into brown shaly silty clay loam. Thin fragments of shale, one-fourth of an inch to an inch in length, make up 10 to 40 percent, by volume, of the subsoil. Included in the areas mapped are some eroded areas, which have a slightly thinner and yellower surface layer consisting of a mixture of original surface material and material from the upper part of the subsoil.

These soils are moderately low in natural fertility, moderately low or low in moisture-supplying capacity, and slightly acid or neutral. They are easy to work and to keep in good tilth. Permeability is moderately rapid in the subsoil. The root zone is shallow or moderately deep. Crops respond well to fertilizer.

These soils are fairly well suited to hay and pasture and to hardwood trees. Some of the acreage is used for corn and tobacco, but yields are usually low. Plants that grow rapidly in spring and early in summer produce the largest yields. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–13; woodland group 2)

Dandridge and Westmoreland silt loams, 6 to 12 percent slopes (DcC).—These are somewhat excessively drained upland soils. The plow layer consists of dark grayish-brown, friable silt loam. The subsoil is yellowish-brown shaly silty clay loam in the upper part and grades, at a depth of about 14 inches, into olive-brown or brownish-yellow shaly silty clay loam. Thin fragments of shale, one-fourth of an inch to an inch in length, make up 10 to 40 percent, by volume, of the subsoil. Some fragments occur throughout the soil. Included in the areas mapped are some moderately eroded areas, which have a slightly thinner and yellower surface layer consisting of a mixture of original surface material and material from the upper part of the subsoil.

These soils are moderately low in natural fertility, moderately low or low in moisture-supplying capacity, and slightly acid or neutral. They are easy to work and to keep in good tilth. Permeability is moderate in the subsoil. The root zone is shallow or moderately deep. Crops respond well to fertilizer.

These soils are fairly well suited to hay and pasture (fig. 10) and to hardwood trees, but high-level management is required. Some of the acreage is used for corn and tobacco, but yields are usually low. Plants that grow rapidly in spring and early in summer produce the largest yields. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IVe–6; woodland group 2)

Dewey Series

The Dewey series consists of well-drained, gently sloping to moderately steep soils on ridgetops and side slopes in the uplands. These soils developed in material weathered from slightly cherty limestone. A few chert fragments, 1 to 2 inches in diameter, occur in the lower part of the subsoil. These soils normally have a plow layer of brown

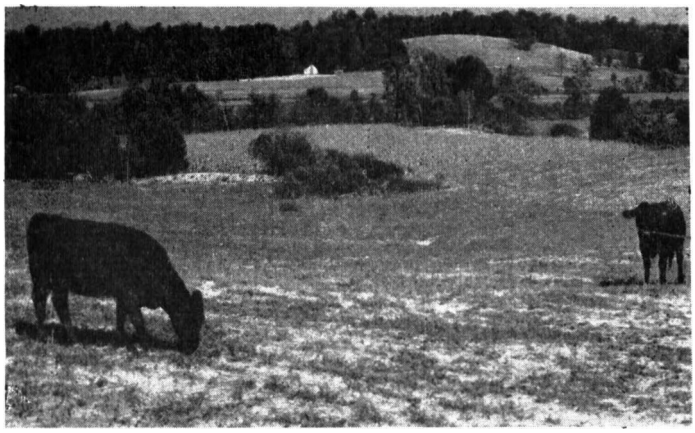

Figure 10.—**Lespedeza and Kentucky 31 fescue on Dandridge and Westmoreland silt loams. Except under high-level management, even these plants must struggle for survival.**

silt loam and a reddish, clayey subsoil. Soils of this series are widely distributed in Metcalfe County, but they make up less than 1 percent of the acreage.

Representative profile of Dewey silt loam:

0 to 7 inches, brown, very friable silt loam.
7 to 12 inches, strong-brown, friable silt loam; blocky structure.
12 to 21 inches, yellowish-red, sticky and plastic, firm silty clay loam; blocky structure.
21 to 38 inches, red, sticky and plastic silty clay; blocky structure.
38 to 44 inches +, yellowish-red, variegated, sticky silty clay.

These soils are moderately high in natural fertility, high or very high in moisture-supplying capacity, and medium acid to very strongly acid. Moisture and roots penetrate to a depth of 4 feet.

Most of the acreage is used for cultivated crops and for pasture. Some of the stronger slopes support stands of second-growth hardwoods, which are used for firewood and lumber.

The gently sloping and sloping areas are suited to all of the crops commonly grown in this area. The moderately steep areas are not well suited to row crops, but they are suitable for pasture and have a high potential for production of wood crops.

Dewey silt loam, 2 to 6 percent slopes (DeB).—This is a well-drained upland soil. It has a plow layer of brown, friable silt loam. Its subsoil is yellowish-red silty clay loam in the upper part and grades, at a depth of about 21 inches, into red, sticky silty clay. Included in the areas mapped are some eroded spots, which have a slightly thinner and redder surface layer.

This soil is moderately high in natural fertility, very high in moisture-supplying capacity, and medium acid to very strongly acid. It is easy to work and to keep in good tilth. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is well suited to all of the commonly grown crops. It is well suited to pasture and to wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–1; woodland group 1)

Dewey silt loam, 6 to 12 percent slopes, eroded (DeC2).—This is a well-drained upland soil. In most places the original surface layer has been mixed with material from the subsoil, and the present surface layer is brown silt loam. The subsoil consists of yellowish-red silty clay loam in the upper part and grades, at a depth of about 16 inches, into red, sticky silty clay. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are some areas where little or no erosion has taken place. In these places the surface layer is friable silt loam and is about 8 inches thick. Also included are a few spots where nearly all of the original surface layer has been removed by erosion. In these places the present surface layer is yellowish-red silty clay loam.

This soil is moderately high in natural fertility, very high in moisture-supplying capacity, and medium acid to very strongly acid. It is low in organic-matter content. It is easy to work and to keep in good tilth. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and to wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–2; woodland group 1)

Dewey silt loam, 12 to 20 percent slopes, eroded (DeD2).—This is a well-drained upland soil. In most places the original surface layer has been mixed with material from the subsoil, and the present surface layer is brown silt loam. The subsoil consists of yellowish-red silty clay in the upper part and grades, at a depth of about 16 inches, into red, sticky silty clay. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are a few spots where nearly all of the original surface layer has been removed by erosion and the present surface layer is yellowish-red silty clay loam.

This soil is moderately high in natural fertility, high in moisture-supplying capacity, and medium acid to very strongly acid. The organic-matter content is low. Tillage is somewhat difficult because of the slope. Permeability is moderately slow. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is well suited to pasture and to wood crops. It is not well suited to row crops, because of the erosion hazard and the slope, but row crops can be grown occasionally in a long cropping sequence. Yields are moderately high. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IVe–3; woodland group 1)

Dickson Series

The Dickson series consists of moderately well drained, level to sloping soils on uplands. These soils developed in material weathered from cherty limestone or in a mantle of loess over cherty limestone residuum. They normally have a plow layer of brown silt loam and a subsoil of yellowish-brown silty clay loam. The subsoil is dense and compact below a depth of about 24 inches, and the growth of plant roots and the movement of water are restricted. Soils of this series are widely distributed in this county. They make up about 3.2 percent of the acreage.

Representative profile of Dickson silt loam:

0 to 7 inches, brown, friable silt loam.
7 to 23 inches, yellowish-brown silt loam or silty clay loam; blocky structure.
23 to 34 inches, yellowish-brown, firm, heavy silt loam mottled with brown and gray; blocky structure; compact and brittle.
34 to 40 inches +, mottled yellowish-red, gray, and yellow silty clay loam; some chert fragments.

These soils are moderate in natural fertility, high or moderately high in moisture-supplying capacity, and strongly acid. Moisture and roots penetrate easily to the dense, compact layer, which retards further penetration.

Most of the acreage is used for cultivated crops and for pasture. Some of the sloping areas support stands of second-growth hardwoods, which are used for firewood and lumber.

These soils are suited to most of the commonly grown crops but not to alfalfa. They are suited to pasture and have a high potential for production of wood crops.

Dickson silt loam, 0 to 2 percent slopes (DkA).—This is a moderately well drained upland soil. It has a plow layer of brown, friable silt loam. Its subsoil consists of yellowish-brown silty clay loam in the upper part and grades, at a depth of about 26 inches, into a compact and brittle layer. Included in the areas mapped are some areas that have a substantially thinner fragipan.

This soil is moderate in natural fertility, high in moisture-supplying capacity, and strongly acid. It is easy to work and to keep in good tilth. The subsoil is moderately permeable above the fragipan. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is suited to pasture and has a high potential for production of wood crops. It is not well suited to alfalfa. It is seasonally wet, and drainage practices are needed to remove excess moisture. (Capability unit IIw–1; woodland group 1)

Dickson silt loam, 2 to 6 percent slopes (DkB).—This is a moderately well drained upland soil. It has a plow layer of brown, friable silt loam. Its subsoil consists of yellowish-brown silty clay loam in the upper part and grades, at a depth of about 26 inches, into a compact and brittle layer.

This soil is moderate in natural fertility, high in moisture-supplying capacity, and strongly acid. It is easy to work and to keep in good tilth. The fragipan in the subsoil is moderately slowly permeable. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is suited to pasture and has a high potential for production of wood crops. It is suited to most of the commonly grown crops but not to alfalfa. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–10; woodland group 1)

Dickson silt loam, 2 to 6 percent slopes, eroded (DkB2).—This is a moderately well drained upland soil. In most places the original surface layer has been mixed with material from the subsoil, and the present plow layer is brown, friable silt loam. The subsoil consists of yellowish-brown silty clay loam in the upper part and grades, at a depth of about 22 inches, into a compact and brittle layer. There are a few galled spots where the subsoil is exposed.

This soil is moderate in natural fertility, moderately high in moisture-supplying capacity, and strongly acid. It is low in organic-matter content. It is easy to work and to keep in good tilth. The subsoil is moderately permeable above the fragipan, but this compact layer restricts the downward movement of water, and permeability is moderately slow in the lower part of the subsoil. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is suited to most of the commonly grown crops but not to alfalfa. It is well suited to pasture, and it has a high potential for production of wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–10; woodland group 1)

Dickson silt loam, 6 to 12 percent slopes, eroded (DkC2).—This is a moderately well drained upland soil. In most places the original surface layer has been mixed with material from the subsoil, and the present plow layer is brown, friable silt loam. The subsoil consists of yellowish-brown silty clay loam in the upper part and grades, at a depth of about 22 inches, into a compact and brittle layer. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are some areas where little or no erosion has taken place. In these places the surface layer is friable silt loam and is about 8 inches thick.

This soil is moderate in natural fertility, moderately high in moisture-supplying capacity, and strongly acid. It is low in organic-matter content. It is easy to work and to keep in good tilth. The subsoil is moderately permeable above the fragipan, but this compact layer restricts the downward movement of water, and permeability is moderately slow in the lower part of the subsoil. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is suited to most of the commonly grown crops but not to alfalfa. It is well suited to pasture and has a high potential for production of wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–3; woodland group 1)

Elk Series

The Elk series consists of well-drained, gently sloping soils on stream terraces. These soils developed in old alluvium washed chiefly from upslope soils that formed in material weathered from limestone. Soils of this series are widely distributed in Metcalfe County, but they make up less than 1 percent of the acreage.

Representative profile of an Elk silt loam:

0 to 9 inches, dark-brown, very friable silt loam.
9 to 14 inches, dark yellowish-brown, friable heavy silt loam.
14 to 38 inches, yellowish-brown, friable to firm silty clay loam; blocky structure.
38 to 52 inches +, brownish-yellow or yellowish-brown sandy loam; blocky structure; about 10 percent of this layer is sand and gravel, which increase in amount with depth.

These soils are high in natural fertility, very high in moisture-supplying capacity, and medium acid or strongly

Figure 11.—**Burley tobacco, in foreground, and corn and alfalfa, in background, on Elk silt loam, 2 to 6 percent slopes. This is an excellent soil for these crops.**

acid. Moisture and roots penetrate to a depth of about 4 feet.

These soils are well suited to all of the commonly grown row crops and to pasture. They have a high potential for production of wood crops. Most of the acreage is used for cultivated crops. Yields of corn, alfalfa, burley tobacco, and small grains (fig. 11) are high.

Elk silt loam, 2 to 6 percent slopes (EkB).—This is a well-drained soil on stream terraces. It is flooded occasionally. Its plow layer consists of dark-brown, very friable silt loam. Its subsoil is silty clay loam, normally yellowish brown but in some places yellowish red. Included in the areas mapped are spots that are nearly level and a few areas that have a slope of more than 6 percent. Also included are a few eroded areas, which have a slightly thinner and yellower surface layer.

This soil is high in natural fertility, very high in moisture-supplying capacity, and medium acid or strongly acid. It is easy to work and to keep in good tilth. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is well suited to all of the commonly grown crops. It is well suited to pasture and has a high potential for production of wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–1; woodland group 5)

Gullied Land

Twenty percent of Gullied land (Gu) consists of deep and moderately deep gullies. Between the gullies most of the soil material has been removed by severe sheet erosion. Patches of topsoil cling to a few spots, but in most places the soil has been so altered that profiles can no longer be distinguished. Gullied land generally occurs in sloping to moderately steep areas that have been improperly managed. This land type makes up less than 1 percent of the county.

These areas are mostly idle. They are not suited to crops or pasture. A few small tracts have been reclaimed for pasture (fig. 12) by levelling with heavy machinery and then reseeding, but in most places revegetation is both difficult and expensive. Trees grow slowly, especially if the soil material is mainly gravel, coarse sand, or shale. Planted trees have a low survival rate. If there is enough soil material to support trees, shortleaf pine and loblolly pine can be planted on the narrow strips between gullies, but in most places sericea lespedeza or kudzu makes a better cover. (Capability unit VIIe–4; woodland group 10)

Humphreys Series

The Humphreys series consists of well-drained, gently sloping or sloping soils on stream terraces, alluvial fans, and foot slopes. These soils developed in alluvial and col-

luvial material derived chiefly from cherty limestone and to a lesser extent from soils underlain by shale and sandstone. These soils normally have a plow layer of brown gravelly silt loam and a subsoil of yellowish-brown heavy silt loam or silty clay loam. Pebbles about half an inch to 3 inches in diameter occur throughout the soils and make up 15 to 40 percent, by volume, of the soil mass. Some areas are subject to flooding. Soils of this series are widely distributed in this county, but they make up only about 1.4 percent of the acreage.

Representative profile of Humphreys cherty silt loam:

0 to 8 inches, brown, friable cherty silt loam.
8 to 14 inches, brown, friable cherty silt loam; blocky structure.
14 to 40 inches, yellowish-brown, slightly firm, gravelly heavy silt loam; blocky structure.
40 to 44 inches +, stratified beds of brown, yellow, and gray chert and gravel.

These soils are moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. Moisture and roots penetrate to a depth of about 40 inches.

Most of the acreage is used for cultivated crops and for pasture. A few small areas are wooded, and the trees are used for firewood and lumber.

These soils are suited to most of the commonly grown crops. They produce moderately high yields of corn, burley tobacco, hay, small grain, and pasture, and they have a high potential for production of wood crops.

Humphreys cherty silt loam, 2 to 6 percent slopes (HcB).—This is a well-drained soil on stream terraces, alluvial fans, and foot slopes. It has a plow layer of brown, friable gravelly silt loam. The upper part of its subsoil is brown gravelly silt loam. This grades, at a depth of about 14 inches, into yellowish-brown gravelly silt loam. In some places small pockets of sandy material occur in the upper part of the subsoil. Included in the areas mapped are some moderately eroded areas, which have a slightly thinner and yellower surface layer.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. Tillage is somewhat difficult because of the gravel. Permeability is moderately rapid. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–11; woodland group 9)

Humphreys cherty silt loam, 6 to 12 percent slopes (HcC).—This is a well-drained soil on stream terraces, alluvial fans, and foot slopes. It has a plow layer of brown, friable gravelly silt loam. The upper part of its subsoil is brown gravelly silt loam. This grades, at a depth of about 14 inches, into yellowish-brown, gravelly heavy silt loam.

Figure 12.—**Gullied land in process of reclamation. Cultivated crops and pasture were grown here before the gullying began. The slope is 12 to 20 percent.**

In some places small pockets of sandy material occur in the upper part of the subsoil.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. Permeability is moderately rapid. Tillage is somewhat difficult because of the gravel. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–6; woodland group 9)

Humphreys cherty silt loam, 6 to 12 percent slopes, eroded (HcC2).—This is a well-drained soil on stream terraces, alluvial fans, and foot slopes. In most places its original surface layer has been mixed with material from the subsoil, and it now has a plow layer of brown, friable gravelly silt loam. Its subsoil is yellowish-brown, gravelly heavy silt loam. This grades, at a depth of about 33 inches, into a bed of stratified gravel. There are a few galled spots where the subsoil is exposed. In some places small pockets of sandy material occur in the upper part of the subsoil.

This soil is moderately high in natural fertility, moderate in moisture-supplying capacity, and medium acid or strongly acid. The organic-matter content is low. Permeability is moderately rapid. Tillage is somewhat difficult because of the content of gravel. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–6; woodland group 9)

Huntington Series

The Huntington series consists of well-drained, nearly level soils on bottom lands and in sinkholes and depressions in the uplands. These soils formed in recent alluvium washed chiefly from upland soils underlain by limestone and to a lesser extent from soils underlain by sandstone and shale. They normally have a surface layer of silt loam. Soils of this series are widely distributed in this county. They make up about 4.9 percent of the acreage.

Representative profile of Huntington silt loam:

0 to 22 inches, dark-brown, very friable silt loam.
22 to 42 inches, brown, friable silt loam; granular structure.
42 to 52 inches +, dark-brown, friable silt loam mottled with pale brown; granular structure.

These soils are high or moderately high in natural fertility, very high to moderately high in moisture-supplying capacity, and medium acid or neutral. Moisture and roots penetrate to a depth of about 4 feet.

Most of the acreage is used for crops. Some small areas are used as pasture, and some are wooded.

These soils are well suited to all of the commonly grown crops. They are excellent for pasture and have a high potential for production of wood crops.

Huntington gravelly silt loam (Hg).—This is a well-drained, gravelly soil on bottom lands and in sinkholes and depressions in the uplands. It has a plow layer of brown, friable gravelly silt loam. Its subsoil consists of dark yellowish-brown gravelly silt loam and grades, at a depth of about 23 inches, into brown very gravelly silt loam. Included in the areas mapped are a few small areas that have a surface layer of silt loam. Also included are a few areas that have a surface layer of fine sandy loam.

This soil is moderately high in natural fertility and in moisture-supplying capacity and is slightly acid or medium acid. Sediments deposited by overflowing streams tend to maintain the fertility, but this gravelly soil is less fertile than Huntington silt loam. Tillage is somewhat difficult because of the gravel. Permeability of the subsoil is moderately rapid or rapid, depending upon the number, size, and concentration of pebbles. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to most of the commonly grown crops and produces moderate yields. It is well suited to pasture and has a high potential for production of wood crops. There is no erosion hazard. (Capability unit IIs–1; woodland group 5)

Huntington silt loam (Hu).—This is a well-drained soil on bottom lands and in sinkholes and depressions in the uplands. It has a plow layer of dark-brown, friable silt loam. Its subsoil is brown, friable silt loam. This grades, at a depth of about 42 inches, into dark-brown, slightly mottled silt loam. The areas along streams are subject to occasional overflow. In sinkholes and depressions and along intermittent drainageways, the parent material was local alluvium.

This soil is high in natural fertility, very high in moisture-supplying capacity, and neutral or medium acid. It is easy to work and to keep in good tilth. The subsoil is moderately permeable. The root zone is deep. Crops respond very well to fertilizer and lime.

This soil is well suited to all of the commonly grown crops (fig. 13). It is well suited to pasture and has a very high potential for production of wood crops. There is no erosion hazard. (Capability unit I–1; woodland group 5)

Landisburg Series

The Landisburg series consists of moderately well drained, gently sloping or sloping soils that have a dense,

Figure 13.—Tobacco on Huntington silt loam, near Willow Shade. Yields are excellent.

compact layer. These soils are on stream terraces and upland foot slopes. They developed in old alluvium or colluvium moved principally from soils underlain by cherty limestone and to a lesser extent from soils underlain by sandstone and shale. Areas on terraces are flooded occasionally. Soils of the Landisburg series are widely distributed in this county, but they comprise only about 1.3 percent of the acreage.

Representative profile of a Landisburg silt loam:

0 to 8 inches, grayish-brown, friable silt loam.
8 to 13 inches, light yellowish-brown, friable silt loam; granular or blocky structure.
13 to 24 inches, brownish-yellow, friable silt loam; blocky structure.
24 to 50 inches, mottled brownish-yellow, pale-brown, and strong-brown, firm silty clay loam; blocky structure; compact and brittle; a few chert fragments.

These soils are moderate or low in natural fertility, low or moderate in moisture-supplying capacity, and strongly acid. Moisture and roots penetrate to a depth ranging from 10 inches to about 2 feet.

Most of the acreage is used for cultivated crops or for pasture. Some areas support stands of hardwoods, which are used for firewood and lumber. The potential for production of wood crops is moderate.

Landisburg cherty silt loam, 6 to 12 percent slopes, eroded (LaC2).—This is a moderately well drained soil on stream terraces and foot slopes. It has a plow layer of light yellowish-brown, slightly sticky cherty silt loam. In most places this layer consists of material from the original surface layer mixed with material from the subsoil. The plow layer grades, at a depth of 17 inches, to a dense, compact layer of mottled yellow, brown, and gray silt loam. Fragments of chert, as much as 3 inches in diameter, occur throughout the soil and make up 15 to 40 percent, by volume, of the soil mass. In places a few small pockets of sandy material occur. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are a few spots where little or no erosion has taken place. In these places the plow layer is brown cherty silt loam.

This soil is moderate or low in natural fertility, low in moisture-supplying capacity, and strongly acid. The organic-matter content is low. The fragipan restricts internal drainage, but the subsoil is moderately permeable above the dense, compact layer. The root zone is shallow. Crops respond moderately well to fertilizer and lime.

This soil is fairly well suited to most cultivated crops, but yields are moderately low. It is suited to pasture and to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IVe–16; woodland group 6)

Landisburg silt loam, 2 to 6 percent slopes (LdB).—This is a moderately well drained soil on stream terraces and foot slopes. It has a plow layer of grayish-brown, friable silt loam. The subsoil is light yellowish-brown or brownish-yellow silt loam. It grades, at a depth of about 24 inches, into a compact and brittle layer. Included in the areas mapped are a few eroded spots, which have a slightly thinner and yellower surface layer. Also included are a few areas that are nearly level. Other inclusions consist of soils that developed in material derived principally from shale and that have a brown surface layer and a yellowish-brown subsoil with olive-gray mottles.

This soil is moderate in natural fertility, moderate in moisture-supplying capacity, and strongly acid. It is easy to work and to keep in good tilth. The fragipan restricts internal drainage, but the subsoil is moderately permeable above this dense, compact layer. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is suited to most of the commonly grown crops, but it is not suited to deep-rooted crops, such as alfalfa. It is suited to pasture and has a moderate potential for production of wood crops. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–7; woodland group 6)

Landisburg silt loam, 6 to 12 percent slopes, eroded (LdC2).—This is a moderately well drained soil on stream terraces and foot slopes. It has a plow layer of light yellowish-brown, friable silt loam. In most places this layer consists of material from the original surface layer mixed with material from the subsoil. The subsoil is yellowish-brown or brownish-yellow silt loam. This grades, at a depth of about 19 inches, into a compact and brittle layer. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are some spots where little or no erosion has taken place. In these places the plow layer is grayish brown. Also included are a few areas that consist of soils that developed in material derived principally from shale and that have a brown or yellowish-brown surface layer and a yellowish-brown subsoil with olive-gray mottles.

This soil is moderate in natural fertility, moderate in moisture-supplying capacity, and strongly acid. The organic-matter content is low. The fragipan restricts internal drainage, but the subsoil is moderately permeable above this compact layer. The root zone is shallow. Crops respond well to fertilizer and lime.

This soil is fairly well suited to most cultivated crops, but yields are normally moderately low. It is suited to pasture and to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–9; woodland group 6)

Lindside Series

The Lindside series consists of moderately well drained, nearly level soils on bottom lands and in upland depressions. These soils formed in recent alluvium washed chiefly from upland soils underlain by limestone and to a lesser extent from soils underlain by sandstone and shale. Most of the areas are subject to flooding and are wet part of the year. The water table is within 3 feet of the surface for considerable periods. Soils of the Lindside series make up less than 1 percent of the county.

Representative profile of Lindside silt loam:

0 to 18 inches, brown, friable silt loam.
18 to 30 inches, brown, friable silt loam mottled with light gray and brownish gray; mottling increases with depth.
30 to 46 inches, light brownish-gray silt loam mottled with grayish brown and yellowish brown; pale-brown and gray stratified alluvium consisting of sand, gravel, and concretions in lower part.

These soils are high in natural fertility and high in moisture-supplying capacity. Roots penetrate to a depth

of about 36 inches or more, depending on the level of the water table.

These soils are suited to most of the commonly grown crops. They are very well suited to pasture, and they have a high potential for production of wood crops. Most of the acreage is used for cultivated crops or pasture. Except in unusually wet years, yields are excellent. Some small areas are wooded.

Lindside silt loam (ls).—This is a moderately well drained soil on bottom lands and in upland depressions. Its plow layer is brown, friable silt loam. Its subsoil is brown, faintly mottled silt loam. At a depth of about 30 inches, the subsoil grades into light brownish-gray, massive, mottled silt loam. Mottling normally occurs at a depth of 18 to 30 inches and increases with depth.

This soil is high in natural fertility, very high in moisture-supplying capacity, and slightly acid or medium acid. The subsoil is moderately permeable. The root zone is deep. Tilth is easily maintained, but the high water table is a slight problem during wet periods. Crops respond well to fertilizer and lime.

This soil is suited to most of the commonly grown crops. It is suited to pasture and has a high potential for production of hardwood trees. If cultivated crops are grown, there is a slight hazard of water erosion. Drainage is needed to lower the water table. (Capability unit I–2; woodland group 5)

Melvin Series

The Melvin series consists of poorly drained, nearly level soils on first bottoms and in large upland depressions. These soils developed in alluvium washed chiefly from soils underlain by limestone and to a lesser extent from soils underlain by shale and sandstone. The Melvin soils normally have a mottled dark grayish-brown surface layer and a mottled gray subsoil. The water table is a foot or less below the surface for considerable periods. When the water table is high, these soils are subject to flooding and to ponding. Soils of the Melvin series make up about 2.4 percent of the county.

Representative profile of Melvin silt loam:

0 to 8 inches, dark grayish-brown, very friable silt loam with some light-gray mottles.
8 to 16 inches, dark-gray, very friable silt loam mottled with pale olive and dark reddish brown.
16 to 50 inches +, gray, friable to firm silt loam mottled with brown and yellow.

These soils are moderate in natural fertility, very high in moisture-supplying capacity, and slightly acid. The organic-matter content is low.

Poor drainage makes these soils unsuitable for cultivated crops, but they are suitable for short-season pasture and they have a high potential for production of water-tolerant trees. About two-thirds of the acreage is wooded. Some of the acreage is used for pasture, and some is idle. A few small areas are partly drained and are used for corn. In drained areas, crops respond well to lime and fertilizer.

Melvin silt loam (Me).—This is a poorly drained soil on bottom lands and in upland depressions. Its surface layer is friable, mottled, dark grayish-brown silt loam. Its subsoil is dark-gray silt loam. At a depth of about 16 inches, the subsoil grades to gray, mottled, slightly firm, massive silt loam.

This soil is moderate in natural fertility, very high in moisture-supplying capacity, and slightly acid. The organic-matter content is low. Permeability is moderately slow. The root zone is deep. Tilth is easy to maintain, but tillage is somewhat difficult because the water table is high.

This soil is suited to short-season pasture and to water-tolerant trees. Only a little of the acreage can be drained and made suitable for cultivation. Crops in drained areas respond well to lime and fertilizer. There is no erosion hazard. (Capability unit IIIw–5; woodland group 7)

Mountview Series

The Mountview series consists of well-drained, gently sloping or sloping upland soils that developed in wind-deposited material over residuum from cherty limestone. These soils normally have a plow layer of brown silt loam and a subsoil of yellowish-brown silt loam that grades, at a depth of about 30 inches, into strong-brown, slightly sticky silty clay loam. Soils of this series are widely distributed in this county, but they make up only about 1.7 percent of the acreage.

Representative profile of Mountview silt loam:

0 to 7 inches, brown, very friable silt loam.
7 to 30 inches, yellowish-brown, friable heavy silt loam; blocky structure.
30 to 40 inches, strong-brown silty clay loam variegated with yellowish brown, yellowish red, and light gray; blocky structure.
40 to 46 inches +, dark-red, sticky clay variegated with yellowish brown and light gray; blocky structure; some chert fragments.

These soils are moderate in natural fertility, high or very high in moisture-supplying capacity, and strongly acid. Moisture and roots penetrate to a depth of about 4 feet.

These soils are suited to all of the commonly grown crops. They are well suited to pasture and have a high potential for production of wood crops. Most of the acreage is used for cultivated crops and for pasture. Some of the sloping areas support stands of second-growth hardwoods, which are used for firewood and lumber.

Mountview silt loam, 2 to 6 percent slopes (MoB).—This is a well-drained upland soil. It has a plow layer of brown, friable silt loam. Its subsoil consists of yellowish-brown, friable silt loam in the upper part and grades, at a depth of about 30 inches, into strong-brown, slightly sticky silty clay loam. Included in the areas mapped are some moderately eroded spots, which have a slightly thinner and yellower surface layer.

This soil is moderate in natural fertility, very high in moisture-supplying capacity, and strongly acid. It is easy to work and to keep in good tilth. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–5; woodland group 1)

Mountview silt loam, 6 to 12 percent slopes, eroded (MoC2).—This is a well-drained upland soil. It has a plow layer of brown, friable silt loam. In most places this layer consists of material from the original surface layer mixed

with material from the subsoil. The subsoil consists of yellowish-brown, friable silt loam in the upper part and grades, at a depth of about 25 inches, into strong-brown, slightly sticky silty clay loam. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are a few places where little or no erosion has taken place and the surface layer is slightly darker colored. Also included are some spots where most of the original surface layer has been removed by erosion. In these places the present surface layer is yellowish-brown silt loam. Also included are a few areas in which the slope is more than 12 percent.

This soil is moderate in natural fertility, high in moisture-supplying capacity, and strongly acid. It is easy to work and to keep in good tilth. The organic-matter content is low. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to most of the commonly grown crops, and yields are moderate. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff, control erosion, and build up the organic-matter content are needed. (Capability unit IIIe–3; woodland group 1)

Muse Series

The Muse series consists of well-drained, sloping soils on foot slopes. These soils developed in old colluvium washed from upland soils formed chiefly in material weathered from acid shale. They normally have a plow layer of brown silt loam and a yellowish-red, clayey subsoil. Soils of this series occur on foot slopes along East Fork Little Barren River in the eastern part of the county. They make up less than 1 percent of the acreage.

Representative profile of Muse silt loam:

0 to 7 inches, brown, friable silt loam.
7 to 12 inches, strong-brown, firm silty clay loam; blocky structure.
12 to 25 inches, yellowish-red, firm silty clay; blocky structure.
25 to 40 inches +, yellowish-red silty clay variegated with brown, light olive brown, and light brownish gray; sticky and plastic; blocky structure; about 7 percent of this layer consists of shale fragments.

These soils are moderately high in natural fertility, very high in moisture-supplying capacity, and strongly acid. Moisture and roots penetrate to a depth of about 4 feet.

These soils are suited to most of the commonly grown crops. They are well suited to pasture and have a fair potential for production of wood crops. Most of the acreage is used for crops and pasture. A few small areas support stands of second-growth hardwoods.

Muse silt loam, 6 to 12 percent slopes (MuC).—This is a well-drained soil. It has a plow layer of brown, friable silt loam. Its subsoil consists of yellowish-red, sticky silty clay, variegated with brown and gray below a depth of about 25 inches. Included in the areas mapped are a few spots that have a slightly thinner and yellower surface layer. In these places the original surface layer has been mixed with material from the subsoil. Also included are a few areas where the slope is less than 6 percent.

This soil is moderately high in natural fertility, very high in moisture-supplying capacity, and strongly acid. It is easy to work and to keep in good tilth. Permeability is moderately slow or slow in the subsoil. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and has a fair potential for production of hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices are needed that will check runoff and control erosion. (Capability unit IIIe–2; woodland group 9)

Newark Series

The Newark series consists of somewhat poorly drained soils along streams and in upland depressions. These soils developed in recent alluvium washed chiefly from upland soils underlain by limestone and to a lesser extent from soils underlain by sandstone and shale. They are subject to flooding, and unless they are drained the water table is within 2 feet of the surface for considerable periods. Soils of this series are widely distributed in Metcalfe County, but they make up only about 1.2 percent of the acreage.

Representative profile of Newark silt loam:

0 to 8 inches, brown, friable silt loam.
8 to 26 inches, brown to grayish-brown, friable silt loam mottled with yellowish brown and gray.
26 to 48 inches +, gray, friable silt loam mottled with yellowish brown; massive.

These soils are moderately high in natural fertility, very high in moisture-supplying capacity, and slightly acid. Moisture and roots penetrate to a depth of about 3 feet.

These soils are not well suited to cultivated crops unless they are drained, but they have a high potential for production of wood crops. Most of the acreage is used for hay and pasture, and some for corn. Good to excellent yields of corn are produced in areas that are adequately drained. Some small areas are wooded, and firewood and lumber are harvested.

Newark silt loam (Nk).—This is a somewhat poorly drained soil on bottom lands and in upland depressions. Its plow layer is friable, dark grayish-brown silt loam. Its subsoil is mottled, grayish-brown silt loam. At a depth of about 26 inches, the subsoil grades to gray, mottled, massive silt loam.

This soil is moderately high in natural fertility, very high in moisture-supplying capacity, and slightly acid. The subsoil is moderately permeable. The root zone is deep. Tillage is somewhat difficult because of wetness. Crops respond well to fertilizer and lime.

This soil is well suited to pasture and to trees. It is also suited to hay. If it is adequately drained, it is well suited to corn. Conservation practices that drain the soil and lower the water table are needed. (Capability unit IIw–4; woodland group 7)

Pembroke Series

The Pembroke series consists of well-drained, gently sloping or sloping soils that developed partly in residuum from limestone and partly in wind-deposited material. These soils are on ridgetops and side slopes. They normally have a plow layer of dark reddish-brown silt loam and a reddish, clayey subsoil. Soils of this series are widely distributed in this county, but they make up less

than 1 percent of the acreage. They are agriculturally important locally.

Representative profile of Pembroke silt loam:

0 to 7 inches, dark reddish-brown, very friable silt loam.
7 to 16 inches, yellowish-red, friable silt loam; blocky structure.
16 to 51 inches +, red or dark-red, firm silty clay loam; blocky structure.

These soils are high in natural fertility, very high in moisture-supplying capacity, and medium acid. Moisture and roots penetrate to a depth of more than 4 feet.

These soils are highly productive. They are suited to all of the commonly grown crops. They are suited to pasture, and they have a high potential for production of wood crops. Most of the acreage is used for cultivated crops, and some small areas are in pasture.

Pembroke silt loam, 2 to 6 percent slopes (PmB).—This is a well-drained upland soil. It has a plow layer of dark reddish-brown, very friable silt loam. Its subsoil consists of yellowish-red, friable silt loam in the upper part and grades, at a depth of about 16 inches, into red or dark-red, sticky silty clay loam. Included in the areas mapped are some tracts that have a slightly thinner and redder surface layer. In these places the original surface layer has been mixed with material from the subsoil. Also included are a few areas that are level or nearly level.

This soil is high in natural fertility, very high in moisture-supplying capacity, and medium acid. It is easy to work and to keep in good tilth. Permeability is moderately slow in the subsoil. The root zone is deep. Crops respond very well to fertilizer and lime.

This soil is well suited to all of the commonly grown crops (fig. 14). It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–1; woodland group 1)

Pembroke silt loam, 6 to 12 percent slopes, eroded (PmC2).—This is a well-drained upland soil. In most places original surface material has been mixed with material from the subsoil, and the present surface layer is reddish-brown, friable silt loam. The subsoil consists of yellowish-red, friable silt loam in the upper part and grades, at a depth of about 12 inches, into red or dark-red, sticky silty clay. There are a few galled spots where the subsoil is exposed. Included in the areas mapped are a few places where little or no erosion has taken place. In these places the surface layer is very friable silt loam and is about 8 inches thick. Also included are small spots where nearly all of the original surface layer has been removed by erosion. In these places the present surface layer is red or reddish-brown silty clay loam.

Figure 14.—Burley tobacco on Pembroke silt loam, 2 to 6 percent slopes. Yields are high.

This soil is high in natural fertility, very high in moisture-supplying capacity, and medium acid. The organic-matter content is low. The soil is easy to work and to keep in good tilth. Permeability is moderate or moderately slow. The root zone is deep. Crops respond very well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–2; woodland group 1)

Renox Series

This series consists of well-drained, sloping soils on foot slopes, lower benches, and fans. These soils developed in material derived from colluvium of mixed origin that rolled or washed chiefly from upland soils underlain by gray and black shale and to a lesser extent from soils underlain by cherty limestone and sandstone. Many shale fragments, about half an inch or less in diameter, occur throughout the subsoil. Soils of this series occur along the southern border of the county, where cropland is scarce. They make up less than 1 percent of the acreage.

Representative profile of Renox silt loam:

0 to 9 inches, dark-brown, very friable silt loam.
9 to 15 inches, dark yellowish-brown, friable silt loam; blocky structure; a few small chert fragments are scattered throughout this layer.
15 to 36 inches, brown, firm shaly silty clay loam variegated with light brown and yellowish brown; blocky structure; about 15 percent shale fragments.
36 to 40 inches +, yellowish-brown, sticky shaly silty clay loam variegated with gray and light yellowish brown; massive; shale fragments and a few small pieces of sandstone and chert make up about 40 percent of this layer.

These soils are moderately high in natural fertility, high in moisture-supplying capacity, and medium acid or strongly acid. Moisture and roots penetrate to a depth of about 40 inches.

These soils are well suited to all of the commonly grown crops. They are suited to pasture and have a high potential for production of wood crops. Most of the acreage is used for hay, pasture, or cultivated crops. Some small areas are wooded.

Renox silt loam, 6 to 12 percent slopes (RaC).—This is a well-drained soil. It has a plow layer of dark-brown, very friable silt loam. Its subsoil is dark yellowish-brown silt loam in the upper part and grades, at a depth of about 15 inches, into brown, sticky shaly silty clay loam. Shale fragments half an inch or less in diameter make up 10 to 40 percent, by volume, of the subsoil. In some places small fragments of chert and sandstone are scattered throughout the subsoil. Included in the areas mapped are some areas where the slope is 2 to 6 percent and some areas where the slope is 12 to 20 percent.

This soil is moderately high in natural fertility, high in moisture-supplying capacity, and medium acid or strongly acid. It is easy to work and to keep in good tilth. The subsoil is moderately permeable. The root zone is deep. Crops respond well to fertilizer and lime.

This soil is suited to all of the commonly grown crops. It is well suited to pasture and very well suited to hardwood trees. If cultivated crops are grown, there is an erosion hazard. Conservation practices that will check runoff and control erosion are needed. (Capability unit IIIe–2; woodland group 9)

Robertsville Series

The Robertsville series consists of poorly drained soils on stream terraces. These soils developed in old alluvium derived principally from soils underlain by limestone but partly from soils underlain by shale and sandstone. They have a dense, compact layer. Some of the areas are subject to flooding. Soils of this series are widely distributed in this county, but they make up less than 1 percent of the acreage.

Representative profile of Robertsville silt loam:

0 to 5 inches, grayish-brown, friable silt loam mottled with yellowish brown.
5 to 14 inches, light olive-gray silt loam mottled with olive yellow and brown; friable; blocky structure.
14 to 40 inches, mottled light-gray, yellowish-brown, and pale-olive silty clay loam; massive; compact and brittle.
40 to 45 inches +, light-gray, sticky silty clay loam mottled with strong brown and pale olive; massive; a few black concretions and a few pebbles are scattered throughout this layer.

These soils are moderately low in natural fertility and in moisture-supplying capacity. They are strongly acid or very strongly acid.

These soils are not well suited to crops, but they are fairly well suited to pasture and have a high potential for production of wood crops. Most of the acreage is wooded, but a few small areas have been cleared and are used for pasture.

Robertsville silt loam (Rb).—This is a poorly drained soil on stream terraces. It has a surface layer of grayish-brown, mottled, friable silt loam. The upper part of its subsoil is light olive-yellow, mottled silt loam. This grades, at a depth of about 14 inches, into mottled, compact and brittle silty clay loam. Included in the areas mapped are some tracts in upland depressions.

This soil is moderately low in natural fertility and in moisture-supplying capacity and is strongly acid or very strongly acid. The organic-matter content is low. The subsoil is moderately permeable above the dense layer, but water moves moderately slowly through the fragipan. The root zone is shallow. Tillage is somewhat difficult because of the wetness. Crops respond fairly well to fertilizer and lime.

This soil is not suited to most crops, but it is fairly well suited to pasture and very well suited to trees. If it is used for cultivated crops, yields are very low. There is a severe hazard of wetness; water stands on the surface after heavy rainfall. Conservation practices that will drain the soil are needed. (Capability unit IVw–1; woodland group 7)

Robinsonville Series

The Robinsonville series consists of deep, well-drained, nearly level sandy soils on bottom lands. These soils formed in recent alluvium washed from upland soils derived mainly from sandstone but partly from limestone and shale. Most of the acreage is subject to occasional overflow from nearby streams. Soils of this series are widely distributed in this county, but they make up less than 1 percent of the acreage.

Representative profile of Robinsonville fine sandy loam:

0 to 12 inches, brown, friable fine sandy loam.
12 to 38 inches, dark-brown, friable fine sandy loam.
38 to 48 inches +, brown, friable fine sandy loam; faintly mottled with grayish brown.

These soils are high in natural fertility and in moisture-supplying capacity and are slightly acid or medium acid. Their root zone is deep. They are suited to all of the crops commonly grown in this county.

Robinsonville fine sandy loam (Rf).—This is a deep, well-drained, sandy soil on stream bottoms. Its surface layer is brown, friable fine sandy loam. The upper part of its subsoil normally is dark-brown fine sandy loam. This grades into fine sandy loam. There are a few grayish-brown mottles below a depth of 38 inches. Included in the areas mapped are a few small tracts that have a surface layer of silt loam. Also included are some areas where the surface layer is gravelly silt loam.

This soil is high in natural fertility and in moisture-supplying capacity and is slightly acid or medium acid. It is easy to work and can be tilled within a wide range of moisture content. Permeability is moderately rapid to a depth of 20 inches and is rapid below a depth of 20 inches. The root zone is deep. Crops respond well to applications of lime. Fertilizer is most effective if it is applied in small quantities at regular intervals.

This soil is suited to all of the crops commonly grown in this county. It is well suited to pasture and has a high potential for production of wood crops. There is no erosion hazard, and cultivated crops can be grown year after year. Conservation practices that will maintain or increase soil fertility and organic-matter content are needed. (Capability unit I–1; woodland group 5)

Rock Land

Rock Land (Rk) consists of areas where outcrops of limestone and other rocks cover 25 to 90 percent of the surface. It occurs mainly on side slopes but also on ridgetops, in areas adjacent to the rocky phases of the Caneyville and Christian soils and to the Baxter-Talbott complexes. The soil between the exposed rocks is shallow and is similar to the surrounding soils. This miscellaneous land type is widely distributed in this county, but it makes up less than 1 percent of the acreage. Included in the areas mapped are a few small areas where outcrops of calcareous shale cover 90 to 100 percent of the surface.

Most of the acreage is suitable only for wood crops. Hickory, oak, and redcedar are the most common species. Potential production is low. Some small areas are cleared, and a few of these can be used for short-season pasture. None of this land type is suitable for cultivated crops. (Capability unit VIIs–5; woodland group 10)

Sango Series

The Sango series consists of moderately well drained, level to gently sloping and slightly depressional soils that have a fragipan. These soils are on uplands. They developed in material weathered from limestone and capped, in places, with a thin deposit of windblown material. They are widely distributed in this county, but they make up only about 1 percent of the acreage.

Representative profile of a Sango silt loam:

0 to 7 inches, pale-brown, friable silt loam.
7 to 20 inches, light yellowish-brown, friable silt loam; blocky structure.
20 to 43 inches +, light yellowish-brown silt loam or silty clay loam mottled with brownish gray and light gray; blocky structure; compact and brittle.

These soils are moderate in natural fertility, moderately high in moisture-supplying capacity, and strongly acid. The organic-matter content is low. Moisture and roots penetrate to a depth of about 2 feet.

These soils are suited to pasture and to most cultivated crops, but yields are moderately low. They have a fair potential for production of wood crops. Most of the acreage is used for pasture or for cultivated crops. In some areas are stands of second-growth hardwoods, which are used for firewood and lumber.

Sango silt loam, 0 to 2 percent slopes (SaA).—This is a moderately well drained upland soil that has a fragipan. It has a plow layer of pale-brown, friable silt loam about 8 inches thick. Its subsoil is light yellowish-brown silt loam in the upper part and grades, at a depth of about 20 inches, into mottled, compact and brittle silt loam or silty clay loam.

This soil is moderate in natural fertility, moderately high in moisture-supplying capacity, and strongly acid. It is easy to work and to keep in good tilth. The organic-matter content is low. Permeability is moderate in the upper part of the subsoil but moderately slow in the fragipan. The root zone is moderately deep; it is limited by the dense fragipan. Crops respond fairly well to fertilizer and lime.

This soil is suited to most of the crops (fig. 15) commonly grown in this county, but yields are moderately low. It is well suited to pasture and fairly well suited to hardwood trees. If cultivated crops are grown, drainage is needed. (Capability unit IIw–2; woodland group 6)

Sango silt loam, 2 to 6 percent slopes (SaB).—This is a moderately well drained upland soil that has a fragipan. It has a plow layer of pale-brown, friable silt loam, about 8 inches thick. Its subsoil is light yellowish-brown silt loam in the upper part and grades, at a depth of about 24 inches, into mottled, compact and brittle silt loam or silty clay loam. In most places the subsoil contains a few small, dark-brown concretions. Included in the areas mapped are some tracts in which the original surface layer has been mixed with material from the subsoil. These tracts have a slightly thinner and yellower surface layer.

Figure 15.—**Corn on Sango silt loam, 0 to 2 percent slopes. Yields are moderately low, even under a high level of management. The fragipan is close to the surface and limits the supply of moisture available to plants.**

This soil is moderate in natural fertility, moderately high in moisture-supplying capacity, and strongly acid. It is low in organic-matter content. It is easy to work and to keep in good tilth. Permeability is moderate in the upper part of the subsoil but is moderately slow in the fragipan. The root zone is moderately deep. Crops respond fairly well to fertilizer and lime.

This soil is suited to most of the crops commonly grown in this county, but yields are moderately low. It is well suited to pasture and fairly well suited to hardwood trees. If cultivated crops are grown, conservation practices that will check runoff and control erosion are needed. (Capability unit IIe–7; woodland group 6)

Taft Series

The Taft series consists of somewhat poorly drained, nearly level soils that have a fragipan. These soils occur on stream terraces. They developed in old alluvium washed mainly from soils derived from limestone but partly from soils derived from sandstone and shale. Some areas are subject to flooding. Soils of this series are widely distributed in this county, but they make up only about 1.6 percent of the acreage.

Representative profile of Taft silt loam:

0 to 9 inches, brown, very friable, mottled silt loam.
9 to 16 inches, light olive-brown and pale-olive, friable silt loam mottled with light gray and brown; blocky structure.
16 to 37 inches +, mottled light yellowish-brown, brown, and light-gray silt loam; blocky structure; compact and brittle.

These soils are moderately low in natural fertility, moderately low in moisture-supplying capacity, and strongly acid. Moisture and roots penetrate to a depth of about 18 inches.

These soils are suited to pasture. They are not well suited to cultivated crops but have a high potential for production of wood crops. Most of the acreage is in second-growth hardwoods, which are used for firewood and lumber. Some of the acreage is used for pasture and some for corn.

Taft silt loam (Ta).—This is a somewhat poorly drained soil that has a fragipan. It has a plow layer of brown, mottled, very friable silt loam. The upper part of the subsoil is pale-olive, mottled, friable silt loam. This grades, at a depth of about 18 inches, into mottled, compact and brittle silt loam. Included in the areas mapped are some cherty areas that have a slope range of 2 to 6 percent. In these places the surface layer is friable cherty silt loam about 8 inches thick. Also included are areas where the surface layer is dark grayish-brown, very friable silt loam about 8 inches thick.

This soil is moderately low in natural fertility, moderately low in moisture-supplying capacity, and strongly acid. The organic-matter content is low. Tillage is somewhat difficult because of wetness, but tilth is good. Permeability is moderate in the upper part of the subsoil but is moderately slow in the fragipan. The root zone is shallow. Crops respond fairly well to fertilizer and lime.

This soil is suited to pasture and is well suited to hardwood trees. It is not well suited to cultivated crops. If cultivated crops are grown, drainage is needed. (Capability unit IIIw–1; woodland group 7)

209-365—66——3

Talbott Series

The Talbott series consists of well-drained upland soils on sloping ridgetops. These soils developed in material weathered from argillaceous limestone. They normally have a plow layer of dark yellowish-brown silt loam and a yellowish-red, clayey subsoil. There are a few rock outcrops in some places. Soils of this series are widely distributed in this county, but they make up less than 1 percent of the acreage. They are mapped individually and also in complexes with Baxter soils.

Representative profile of Talbott silt loam:

0 to 7 inches, dark yellowish-brown, friable silt loam.
7 to 27 inches, yellowish-red, sticky and plastic silty clay or clay; blocky structure.
27 to 37 inches, variegated dark-red and yellowish-brown, very sticky clay; blocky structure.
37 to 46 inches +, yellowish-brown, very sticky clay variegated with red; blocky structure.

These soils are moderately high in natural fertility and in moisture-supplying capacity. Normally, they are medium acid or strongly acid. Moisture and roots penetrate to a depth of about 3 feet.

These soils are suited to hay and pasture and, in places, to cultivated crops. Potential productivity is fair, and a medium level of management is justified. Most of the acreage is used for hay and pasture. Some cleared acreage is idle. On some of the steeper slopes are stands of second-growth hardwoods, mainly oak and hickory, which are used for firewood and lumber.

Talbott silt loam, 6 to 12 percent slopes (TbC).—This is a well-drained upland soil. It has a plow layer of dark yellowish-brown, friable silt loam. Its subsoil is yellowish-red silty clay loam in the upper part and grades, at a depth of about 13 inches, into yellowish-red, very sticky and very plastic clay. There are rock outcrops in some areas but too few to interfere with tillage. Included in the areas mapped are some areas that have a slope of less than 6 percent. Also included are a few small areas that have a yellowish-brown, fine-textured subsoil.

This soil is moderately high in natural fertility and in moisture-supplying capacity and is medium acid or strongly acid. Its friable silt loam surface layer makes the soil easy to till. Permeability is slow in the subsoil below a depth of about 27 inches. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is well suited to hay and pasture. It can be used for row crops occasionally in a long cropping sequence. Its potential for production of wood crops is fair. If cultivated crops are grown, there is an erosion hazard and conservation practices that will check runoff are needed. (Capability unit IVe–8; woodland group 8)

Talbott silty clay loam, 6 to 12 percent slopes, eroded (TcC2).—This is a well-drained upland soil. In most places the original surface material has been mixed with material from the subsoil, and the present plow layer is yellowish-red, slightly firm silty clay loam. Its subsoil is yellowish-red, very firm, very sticky and very plastic clay. There are some rock outcrops, but they cover less than 2 percent of the surface. There are some galled spots where the subsoil is exposed. Included in the areas mapped are a few places that have a slope of less than 6 percent and a few areas where most of the original surface layer has been removed by erosion. In these places the present surface

layer is yellowish-red silty clay. Also included are a few small areas that have a yellowish-brown, fine-textured subsoil.

This soil is moderately high in natural fertility and in moisture-supplying capacity and is normally medium acid or strongly acid. The organic-matter content is low. Tillage is somewhat difficult because of the fine-textured surface layer. The subsoil is slowly permeable below a depth of 27 inches. The root zone is moderately deep. Crops respond well to fertilizer and lime.

This soil is well suited to hay and pasture and can be used for row crops occasionally in a long cropping sequence. Its potential for production of wood crops is fair. If cultivated crops are grown, there is an erosion hazard, and conservation practices that will check runoff and control erosion are needed. (Capability unit IVe–8; woodland group 8)

Westmoreland Series

The Westmoreland series consists of somewhat excessively drained, gently sloping to steep upland soils on ridges and side slopes. These soils developed in residuum from calcareous shale and shaly limestone. Some areas are stony. In this county, Westmoreland soils occur in an irregular pattern with Dandridge soils and are mapped with them in undifferentiated mapping units. They are deeper over bedrock than Dandridge soils and have slightly stronger profile development. These two kinds of soils are widely distributed in this county. Together, they make up 22.6 percent of the acreage. An area may consist of both soils in varying proportions or of either soil without the other. More than 65 percent of the acreage is moderately steep or steep.

Representative profile of Westmoreland shaly silt loam:

0 to 7 inches, dark grayish-brown, friable shaly silt loam.
7 to 13 inches, yellowish-brown shaly silty clay loam; blocky structure.
13 to 18 inches, brownish-yellow shaly silty clay loam; variegations of strong brown and light olive brown; blocky structure.
18 to 25 inches, brown shaly silty clay loam; variegations of strong brown and light olive brown; blocky structure.
25 inches +, calcareous limestone bedrock.

These soils are moderate in natural fertility, except in severely eroded areas, where natural fertility is moderately low. They are moderately low to very low in moisture-supplying capacity and are slightly acid or neutral.

Most of the acreage is used for wood crops, mainly oak, hickory, and redcedar. The steeper areas are not suited to cultivated crops. The cleared areas are used mainly for hay and short-season pasture.

Use of the Soils for Agriculture

In this section some of the soil management practices that can be applied in Metcalfe County are discussed. The capability classification system is explained, and the capability units are described. Estimates of yields of selected crops are also given. More detailed information can be obtained from the local staffs of the Soil Conservation Service and the Extension Service and from the State Agricultural Experiment Station.

General Management

Most of the soils in Metcalfe County are acid, medium or low in natural fertility, and low in content of organic matter. Crops generally respond well to applications of lime and fertilizer. The amount of lime and fertilizer to be applied should be decided in accordance with the results of soil tests, the requirements of the crop to be grown, and the level of yield sought. Soil tests can be made at the Kentucky Agricultural Experiment Station at Lexington. Samples for testing should represent a single soil type. The soil map is a good guide for taking samples. Each sample should represent no more than 10 acres. Detailed instructions for sampling and for requesting tests can be obtained from representatives of the Soil Conservation Service or from the County Extension Agent.

It is not economical to attempt to build up the organic-matter content of the soils to a high level, but it is important to maintain a constant supply. This can be done by applying farm manure, encouraging plant growth, and leaving plant residue on the surface.

Planting, cultivating, and harvesting are apt to alter the structure of the soil, so over-cultivation should be avoided. Tillage should be done with implements that stir the plow layer but leave crop residue on the surface. The residue protects the soil against the beating of raindrops and retards crusting; as a result, more water infiltrates and less runs off.

All of the sloping soils in Metcalfe County are subject to erosion if cultivated. Damage is most likely to occur while a crop is growing. Practices effective in controlling erosion include contour cultivation, terracing, stripcropping, use of diversions and grassed waterways, minimum tillage, use of crop residue, growing of cover crops, and application of fertilizer. These conservation practices make it feasible to include more row crops in a cropping sequence.

Some of the soils in the county are too wet to be cultivated unless they are drained. Excessive moisture causes delay in seedbed preparation and in planting. A soil that is saturated for extended periods is an unhealthy environment for plant roots, and growing crops may be drowned out. In this county, open ditches are the most common means of removing excess water. In some places tile drains are more satisfactory, but they are also more expensive.

Most soils that are underlain by a claypan or a fragipan are difficult to drain. Tile drains ordinarily are not effective, and open ditches are effective only if they intercept water moving laterally above the pan.

Wet soils that are deep and permeable are productive after drainage, if they are well managed.

Capability Groups of Soils

Capability classification is the grouping of soils to show, in a general way, their suitability for most kinds of farming. It is a practical classification based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. The soils are classified according to degree and kind of permanent limitation, but without consideration of major and generally expensive

landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamation projects.

In the capability system, all kinds of soils are grouped at three levels: capability classes, subclasses, and units. These are discussed in the following paragraphs.

CAPABILITY CLASSES, the broadest grouping, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I. Soils have few limitations that restrict their use.

Class II. Soils have some limitations that reduce the choice of plants or require moderate conservation practices.

Class III. Soils have severe limitations that reduce the choice of plants, or require special conservation practices, or both.

Class IV. Soils have very severe limitations that restrict the choice of plants, or require very careful management, or both.

Class V. Soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover. (None in this county.)

Class VI. Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.

Class VII. Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.

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

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only subclasses indicated by *w*, *s*, and *c*, because the soils in it are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other response to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–5 or IIIe–6. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit. In Metcalfe County, the capability units are not numbered consecutively within the subclasses, because they fit into the statewide system of capability classification, and not all of the capability units in the State are represented in this county.

Management by capability units

In the following pages the capability units in Metcalfe County are described and suggestions for the use and management of the soils are given.

CAPABILITY UNIT I-1

This unit consists of well-drained, level or nearly level Huntington and Robinsonville soils on bottom lands. In most places the plow layer and the subsoil are friable silt loam or fine sandy loam, but in a few places they are loam. The root zone is deep. These soils are high or very high in moisture-supplying capacity, high in natural fertility, and neutral or medium acid. The organic-matter content is medium. There is little or no erosion hazard, but overflow from streams may damage crops in some years.

These soils can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good.

These soils are well suited to all of the crops and pasture plants commonly grown in this county. Under high-level management, row crops can be grown year after year, and yields of tobacco, corn (fig. 16), and small grain are favorable. Under medium- or high-level management, these soils are well suited to alfalfa, orchardgrass, red clover, Ladino clover, lespedeza, and Kentucky 31 fescue.

A combination of grassed waterways and diversion ditches helps to control surface runoff.

This unit occupies about 3.9 percent of the county.

CAPABILITY UNIT I-2

This unit consists of a moderately well drained, level Lindside soil on bottom lands. The plow layer and the subsoil are friable silt loam. The root zone is deep. This soil is very high in moisture-supplying capacity, high in natural fertility, and slightly acid or medium acid. The organic-matter content is medium. There is little or no erosion hazard, but overflow from streams may damage crops occasionally.

This soil is easy to work and to keep in good tilth. It can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good.

This soil is well suited to most of the crops and pasture plants grown in this county. Under high-level management, row crops can be grown year after year. Yields of corn, tobacco, and small grain are favorable, especially if the soil is drained. Under medium- or high-level management, this soil is well suited to orchardgrass, red clover, Ladino clover, Kobe lespedeza, and sericea lespedeza.

Figure 16.—**Huntington silt loam, near Summer Shade. Corn is harvested year after year from this area. In background, wooded slope of Dandridge and Westmoreland soils.**

Alfalfa can be grown only under high-level management that includes drainage.

Tile drainage lengthens the period when fields can be worked. Construction of diversion ditches at the base of slopes helps to control runoff and overwash from adjacent higher slopes.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT IIe-1

This unit consists of well-drained, gently sloping soils that have a deep root zone. These soils are in the Christian, Crider, Dewey, Elk, and Pembroke series, and they have a slope range of 2 to 6 percent. They are very high in moisture-supplying capacity, high in natural fertility, and medium acid or strongly acid. The organic-matter content is medium.

These soils are easy to work and to keep in good tilth. They can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good. The yield potential of the Christian and Dewey soils is slightly less than that of the other soils in the unit.

These soils are well suited to all of the crops and pasture plants grown in the county. Under high-level management, they produce favorable yields of tobacco, corn, and small grain. Under medium- or high-level management, they are well suited to orchardgrass, red clover, Ladino clover, Kobe lespedeza, sericea lespedeza, and Kentucky 31 fescue. Alfalfa can be grown but requires high-level management.

The chief hazards when these soils are cultivated are runoff and erosion. On short slopes, erosion can be controlled by growing sod crops 2 years out of 4, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies about 6.1 percent of the county.

CAPABILITY UNIT IIe-5

This unit consists of a well-drained, gently sloping soil of the Mountview series. This soil has a deep root zone. The plow layer is friable silt loam. This soil is very high in moisture-supplying capacity, moderate in natural fertility, and strongly acid. The organic-matter content is medium.

This soil is easy to work and to keep in good tilth. It can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good.

This soil is well suited to most of the crops and pasture plants grown in this county. Under high-level management, it produces moderate yields of corn, tobacco, and small grain. Under medium- or high-level management, it is well suited to Kentucky 31 fescue, orchardgrass, and Korean lespedeza. Alfalfa can be grown but requires high-level management.

The chief hazards when this soil is cultivated are runoff and erosion. On short slopes, erosion can be controlled by growing sod crops 2 years out of 4, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies about 1.1 percent of the county.

CAPABILITY UNIT IIe-7

This unit consists of moderately well drained Landisburg and Sango soils that have a slope range of 2 to 6 percent. These soils have a moderately deep root zone. They have a plow layer of friable silt loam, and they have a fragipan at a depth of 24 inches. They are moderately high in moisture-supplying capacity, moderate in natural fertility, and strongly acid. The organic-matter content is low.

These soils can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good.

These soils are fairly well suited to most of the crops and pasture plants grown in the county. Under high-level management, they produce moderate yields of corn, tobacco, and small grain. Under medium- or high-level management, they are well suited to Kentucky 31 fescue, redtop, Ladino clover, red clover, Kobe lespedeza, and Korean lespedeza. Orchardgrass can be grown only under high-level management.

The chief hazards when these soils are cultivated are runoff and erosion. On short slopes erosion can be controlled by growing sod crops 2 years out of 4, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies about 1.6 percent of the county.

CAPABILITY UNIT IIe-10

This unit consists of moderately well drained Captina and Dickson soils. These soils have a fragipan below a depth of 24 to 30 inches. The plow layer is friable silt loam. The root zone is moderately deep. These soils are moderately high in moisture-supplying capacity, moderate or moderately high in natural fertility, and strongly acid. The organic-matter content is medium or low.

These soils can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good.

These soils are well suited to most of the crops and pasture plants grown in this county, but they are not suited to deep-rooted crops. Under high-level management, they produce moderate yields of corn, tobacco, and small grain. Under medium- or high-level management, they are well suited to Kentucky 31 fescue, redtop, red clover, Korean lespedeza, and sericea lespedeza. Orchardgrass, alfalfa, and Ladino clover can be grown but require high-level management.

The chief hazards when these soils are cultivated are runoff and erosion. On short slopes erosion can be controlled by growing sod crops 2 years out of 4, by cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies about 4 percent of the county.

CAPABILITY UNIT IIe-11

This unit consists of well-drained soils of the Baxter, Clarksville, Cumberland, and Humphreys series. These soils have a deep root zone. The plow layer is friable cherty silt loam. The slope range is 2 to 6 percent. The soils are moderate in moisture-supplying capacity, moderately high in natural fertility, and strongly acid. The organic-matter content is medium or low.

These soils are slightly droughty. Chert and gravel in the plow layer interfere somewhat with tillage. The response of crops to lime and fertilizer is good.

These soils are well suited to most of the crops and pasture plants grown in this county. Under high-level management, they produce favorable yields of corn, tobacco, and small grain. Under medium- or high-level management, they are well suited to Kentucky 31 fescue, Korean lespedeza, and sericea lespedeza. Orchardgrass, alfalfa, Ladino clover, and red clover can be grown but require high-level management.

The chief hazards when these soils are cultivated are runoff and erosion. On short slopes, erosion can be controlled by growing sod crops 2 years out of 4, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies about 5.6 percent of the county.

CAPABILITY UNIT IIw-1

This unit consists of moderately well drained, nearly level, slightly wet soils of the Captina and Dickson series. These soils have a fragipan below a depth of about 2 feet. The plow layer is friable silt loam. The root zone is moderately deep. These soils are moderately high or high in moisture-supplying capacity, moderately high in natural fertility, and medium acid to very strongly acid. The organic-matter content is medium. There is no erosion hazard.

These soils can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good.

These soils are well suited to some of the crops and pasture plants grown in this county but not to deep-rooted crops or to plants that cannot tolerate slight wetness. Under high-level management, they produce favorable yields of corn, tobacco, and small grain. Under medium- or high-level management, they are well suited to Kentucky 31 fescue, redtop, red clover, Kobe lespedeza, and Korean lespedeza. Orchardgrass, timothy, Ladino clover, and sericea lespedeza can be grown but require high-level management.

Under medium-level management, a cropping system consisting of 2 years of corn and 1 year of meadow can be used. Under high-level management, including surface drainage, these soils can be maintained by using a cropping system that includes sod crops 1 year out of 3, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT IIw-2

This unit consists of a moderately well drained, level and nearly level soil of the Sango series. This soil has a fragipan below a depth of about 2 feet. The plow

layer is friable silt loam. The root zone is moderately deep. This soil is moderate in moisture-supplying capacity, moderate in natural fertility, and strongly acid. The organic-matter content is low. There is no erosion hazard.

This soil can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good.

This soil is suited to several of the crops and pasture plants grown in this county but not to deep-rooted crops or to plants that cannot tolerate slight wetness. Under medium- or high-level management, it is well suited to Kentucky 31 fescue, Ladino clover, red clover, Kobe lespedeza, and Korean lespedeza. Corn, tobacco, and small grain can be grown, but yields are only moderate or low, even with high-level management. Timothy and sericea lespedeza can be grown but require high-level management.

Under medium-level management, a cropping system consisting of 1 year each of corn, grain, and meadow can be used. Under high-level management, including adequate surface drainage, these soils can be maintained by using a cropping system that includes 3 years of corn followed by 1 year of meadow, leaving crop residue on the surface, establishing grassed waterways, constructing open ditches, and installing diversions at the base of slopes.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT IIw–4

This unit consists of a somewhat poorly drained, level soil of the Newark series. This soil is seasonally wet. The plow layer is friable silt loam. The root zone is deep. This soil is very high in moisture-supplying capacity, moderately high in natural fertility, and slightly acid. The organic-matter content is medium. There is little or no erosion hazard, but in some places overflow from streams may damage crops early in spring.

This soil can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good.

This soil is suited to plants that tolerate wetness. Under high-level management that includes drainage, it produces moderate yields of tobacco, corn, and small grain. Under medium- or high-level management, it is well suited to Kentucky 31 fescue, redtop, timothy, Ladino clover, red clover, Kobe lespedeza, and Korean lespedeza. Smooth bromegrass, orchardgrass, and sericea lespedeza can be grown but require high-level management.

Under medium-level management, a conservation cropping system consisting of 2 years of corn followed by 2 years of meadow can be used. Under high-level management, row crops can be grown year after year if crop residue is left on the surface, grassed waterways are established, and diversions are installed. Some areas need to be drained.

This unit occupies about 1.2 percent of the county.

CAPABILITY UNIT IIs–1

This unit consists of a well-drained, gravelly Huntington soil on bottom lands. The plow layer is friable gravelly silt loam. The root zone is deep. This soil is moderately high in moisture-supplying capacity, moderately high in natural fertility, and slightly acid or medium acid. The organic-matter content is medium. There is no erosion hazard, but there is a hazard of occasional flooding.

The soil in this unit is droughty. Tillage is somewhat difficult because of the high content of gravel.

This soil is suited to many of the crops and pasture plants grown in this county. Under high-level management, it produces favorable yields of tobacco, corn, and small grain. Under medium- or high-level management, it is well suited to Kentucky 31 fescue, redtop, timothy, red clover, Korean lespedeza, and sericea lespedeza. Alfalfa, Ladino clover, and Kobe lespedeza can be grown but require high-level management.

Under medium-level management, a cropping system consisting of 2 years of corn followed by 1 year of meadow can be used. Under high-level management, row crops can be grown year after year if crop residue is left on the surface and if diversions are installed and grassed waterways are established where needed.

This unit occupies about 1.6 percent of the county.

CAPABILITY UNIT IIIe–2

This unit consists of well-drained soils of the Christian, Crider, Dewey, Muse, Pembroke, and Renox series. The slope range is 6 to 12 percent. The plow layer is friable silt loam. The root zone is deep. These soils are moderately high or very high in moisture-supplying capacity, moderately high in natural fertility, and medium acid or very strongly acid. The organic-matter content is medium or low.

These soils are easy to work, except in a few galled spots where the subsoil is exposed. Tilth is easily maintained. The response of crops to lime and fertilizer is good.

These soils are well suited to most of the locally grown crops and pasture plants. Under high-level management, they produce favorable yields of tobacco, corn, and small grain. Under medium- or high-level management, they are well suited to Kentucky 31 fescue, redtop, Ladino clover, red clover, Kobe lespedeza, Korean lespedeza, and sericea lespedeza. Smooth bromegrass, orchardgrass, timothy, alfalfa, and alsike clover can be grown but require high-level management.

The chief hazards when these soils are cultivated are runoff and erosion. On short slopes erosion can be controlled by growing sod crops 3 years out of 4, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies about 3.3 percent of the county.

CAPABILITY UNIT IIIe–3

This unit consists of well drained or moderately well drained soils of the Dickson and Mountview series. The slope range is 6 to 12 percent. The plow layer is friable silt loam. The root zone is deep or moderately deep. These soils are moderately high or very high in moisture-supplying capacity, moderate in natural fertility, and slightly acid. The organic-matter content is low.

These soils are easy to work and easy to keep in good tilth. They can be cultivated within a wide range of moisture content without clodding or crusting, except in a few galled spots where the subsoil is exposed. The response of crops to lime and fertilizer is good.

These soils are suited to most of the locally grown crops and pasture plants. Under high-level management, they produce moderate yields of tobacco, corn, and small grain. Under medium- or high-level management, they are well

suited to Kentucky 31 fescue, Ladino clover, red clover, Korean lespedeza, and sericea lespedeza. Smooth bromegrass, orchardgrass, redtop, timothy, and alfalfa can be grown but require high-level management.

The chief hazards when these soils are cultivated are runoff and erosion. On short slopes, erosion can be controlled by growing sod crops 3 years out of 4, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT IIIe–6

This unit consists of well-drained soils of the Baxter, Clarksville, Cumberland, and Humphreys series. These soils are 15 to 40 percent gravel and chert. The slope range is 6 to 12 percent. The plow layer is friable cherty silt loam. The root zone is deep. These soils are moderate in moisture-supplying capacity, moderate or high in natural fertility, and are slightly acid to strongly acid. The organic-matter content is medium or low.

These soils can be cultivated within a wide range of moisture content without clodding or crusting. Gravel and chert interfere somewhat with tillage. The response of crops to lime and fertilizer is good.

These soils are well suited to most of the crops and pasture plants grown in this county. Under high-level management, they produce moderate yields of tobacco, corn, and small grain. Under medium- or high-level management, they are well suited to Kentucky 31 fescue, Ladino clover, Korean lespedeza, and sericea lespedeza. Orchardgrass, alsike clover, timothy, Kobe lespedeza, and alfalfa can be grown but require high-level management.

The chief hazards if these soils are cultivated are runoff and erosion. On short slopes erosion can be controlled by growing sod crops 3 years out of 4, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies about 16.1 percent of the county.

CAPABILITY UNIT IIIe–9

This unit consists of a moderately well drained Landisburg soil on foot slopes and terraces. This soil has a fragipan below a depth of about 24 inches. The original surface layer has been mixed with material from the subsoil, and the present plow layer is friable silt loam, cherty in some places. There are a few galled spots where the subsoil is exposed. The root zone is shallow. The slope range is 6 to 12 percent. This soil is moderate in moisture-supplying capacity, moderate in natural fertility, and strongly acid. The organic-matter content is low. The response of crops to lime and fertilizer is good.

This soil is suited to several of the crops and pasture plants grown in the county but is not well suited to deep-rooted crops. Even under high-level management, it produces only low yields of tobacco, corn, and small grain. Under medium- or high-level management, it is well suited to Kentucky 31 fescue, Ladino clover, Korean lespedeza, and sericea lespedeza. Orchardgrass, redtop, timothy, and red clover can be grown but require high-level management.

The chief hazards if this soil is cultivated are runoff and erosion. On short slopes, erosion can be controlled by growing sod crops 4 years out of 6, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed. Diversions may be needed in seep areas.

This unit occupies less than 1 percent of the county.

Figure 17.—**Tobacco on Dandridge and Westmoreland silt loams, 2 to 6 percent slopes. In dry years these soils make poor yields of tobacco because the amount of moisture available to plants is limited.**

CAPABILITY UNIT IIIe–13

This unit consists of somewhat excessively drained soils of the Dandridge and Westmoreland series. The slope range is 2 to 6 percent. The plow layer is friable silt loam. In most places the subsoil contains many shale fragments. The root zone is shallow to moderately deep. These soils are moderately low in moisture-supplying capacity, moderate in natural fertility, and slightly acid to neutral. The organic-matter content is medium.

These soils are easy to work and to keep in good tilth. They can be cultivated within a wide range of moisture content without clodding or crusting.

Under medium- or high-level management, these soils are suited to Korean lespedeza and sericea lespedeza. Kentucky 31 fescue and Kobe lespedeza can be grown but require high-level management. These soils are not well suited to most of the cultivated crops (fig. 17) and pasture plants commonly grown in the county.

The chief hazards when these soils are cultivated are runoff and erosion. On short slopes, erosion can be controlled by growing sod crops 3 years out of 5, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT IIIw-1

This unit consists of a somewhat poorly drained, level and nearly level Taft soil that has a shallow root zone. The plow layer is friable silt loam. This soil is moderately low in moisture-supplying capacity, moderately low in natural fertility, and strongly acid. The organic-matter content is low.

This soil can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is fair.

Wetness limits the suitability of this soil for crops and pasture. Even under high-level management, yields of corn, tobacco, and small grain are low or only moderate. Under medium- or high-level management, this soil is well suited to Kentucky 31 fescue, redtop, Ladino clover, Kobe lespedeza, and Korean lespedeza. Timothy, alsike clover, and red clover can be grown but require high-level management.

Wetness is the chief limitation. Fair productivity can be maintained by growing sod crops 2 years out of 3, cultivating on the contour, establishing grassed waterways, installing diversions, and draining the soils.

This unit occupies about 1.6 percent of the county.

CAPABILITY UNIT IIIw-5

This unit consists of a poorly drained Melvin soil in nearly level areas or in slight depressions on bottom lands. This soil is wet most of the time, and in places it is subject to ponding and to overflow from streams. The plow layer is friable silt loam. The thickness of the root zone varies with the depth to the water table. This soil is very high in moisture-supplying capacity, moderate in natural fertility, and slightly acid or medium acid. It is moderately permeable. The organic-matter content is low.

Tilth is easily maintained in areas that have been drained. The response of crops to lime and fertilizer is good.

This soil is usually too wet for cultivated crops or hay unless it is drained, but if drainage is adequate, it produces moderate yields of corn (fig. 18), soybeans, Kobe lespedeza, and Korean lespedeza. Under high-level management that includes drainage, it can be used for row crops year after year. It is not well suited to tobacco, alfalfa, red clover, orchardgrass, or timothy. It is best suited to alsike clover, Ladino clover, Kentucky 31 fescue, and redtop; well-managed stands of these plants make good summer pasture.

This soil needs management that will maintain the supply of organic matter. If cropped intensively, it can be kept productive by keeping tillage to a minimum, growing winter cover crops and occasional meadow or pasture crops, and turning under crop residue.

Drainage by means of tile or open ditches would make this soil suitable for a wider range of crops, but the feasibility of drainage depends upon whether or not there are suitable outlets. In some places diversion ditches at the base of slopes would control runoff and overwash from adjacent higher areas.

This unit occupies about 2.4 percent of the county.

CAPABILITY UNIT IVe-3

This unit consists of well-drained soils of the Baxter, Christian, Clarksville, Cumberland, and Dewey series. These soils have a deep root zone. In most of the acreage, the plow layer is friable cherty silt loam. The slope range is 12 to 20 percent. The soils in this unit are moderate in moisture-supplying capacity, moderately high or high in natural fertility, and slightly acid to strongly acid. The organic-matter content is low or medium.

These soils are somewhat droughty. The plow layer is easy to keep in good tilth, but fragments interfere with tillage in cherty areas. The response of crops to lime and fertilizer is good.

These soils are well suited to most of the crops and pasture plants grown in this county. Tobacco, corn, and small grain can be grown under high-level management, but yields are only moderate. The Christian soil in this unit is not well suited to row crops, but a row crop can be grown on it occasionally in a long cropping sequence. Under medium- or high-level management, these soils are well suited to Kentucky 31 fescue, Ladino clover, red clover, Korean lespedeza, and sericea lespedeza. Orchardgrass, timothy, alsike clover, Kobe lespedeza, and alfalfa can be grown but require high-level management.

The chief hazards when these soils are cultivated are runoff and erosion. On short slopes, erosion can be controlled by growing sod crops 4 years out of 6, by cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies about 9.8 percent of the county.

CAPABILITY UNIT IVe-6

This unit consists of somewhat excessively drained Dandridge and Westmoreland soils. These soils have a shallow or moderately deep root zone. The plow layer is friable silt loam. The slope range is 6 to 12 percent. These soils are low in moisture-supplying capacity, moderately low in natural fertility, and slightly acid or neutral. The organic-matter content is medium.

These soils are easy to work and to keep in good tilth. They can be cultivated within a wide range of moisture content without clodding or crusting. The response of crops to lime and fertilizer is good.

Under medium- or high-level management, these soils are well suited to Kentucky 31 fescue, Korean lespedeza, and sericea lespedeza. Orchardgrass, timothy, Ladino clover, red clover, and Kobe lespedeza can be grown but require high-level management. These soils are not well suited to row crops. Even under high-level management, only low yields of tobacco or corn can be expected.

The shallow root zone and the erosion hazard are the main limitations if these soils are cultivated. On short slopes, erosion can be controlled by growing sod crops 3 years out of 4, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies about 2.8 percent of the county.

Figure 18.—**Melvin silt loam, drained and used for corn. Yields are usually moderate.**

CAPABILITY UNIT IVe–8

This unit consists of well-drained, fine-textured soils of the Talbott series. The slope range is 6 to 12 percent. These soils have a moderately deep root zone. They are moderately high in moisture-supplying capacity, moderately high in natural fertility, and medium acid or strongly acid. The organic-matter content is medium or low. Permeability is slow.

In uneroded areas these soils are easy to keep in good tilth. The response of crops to lime and fertilizer is good.

These soils produce only moderate or low yields of corn, tobacco, small grain, and pasture. Under medium- or high-level management, they are suited to Kentucky 31 fescue and sericea lespedeza. Orchardgrass, timothy, red clover, Kobe lespedeza, and Korean lespedeza can be grown but require high-level management.

The chief hazards when these soils are cultivated are runoff and erosion. On short slopes, erosion can be controlled by growing sod crops 4 years out of 6, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT IVe–11

This unit consists of a well-drained cherty Baxter soil that has a slope range of 6 to 12 percent. The plow layer is silty clay loam. The root zone is deep. This soil is moderately low in moisture-supplying capacity, moderately low in natural fertility, and medium acid or strongly acid. The organic-matter content is very low.

This soil is subject to severe clodding and crusting because the content of organic matter is very low and the surface layer is clayey. Chert fragments interfere with tillage. The response of crops to lime and fertilizer is fair.

Under medium- or high-level management, this soil is suited to Kentucky 31 fescue, Korean lespedeza, and sericea lespedeza. Yields of corn, tobacco, and small grain are low. Orchardgrass, redtop, timothy, red clover, and Kobe lespedeza can be grown but require high-level management.

Poor workability and the erosion hazard are the main limitations if these soils are cultivated. On short slopes, erosion can be controlled by growing sod crops 4 years out of 6, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT IVe–16

This unit consists of a moderately well drained, cherty Landisburg soil that has a fragipan below a depth of about 18 inches. The plow layer and the upper part of the subsoil are friable cherty silt loam. The root zone is shallow. The slope range is 6 to 12 percent. This soil is low in moisture-supplying capacity, moderate or low in natural fertility, and strongly acid. The organic-matter content is low.

This soil is severely droughty, but the fragipan restricts internal drainage and the soil is wet during part of the growing season. If the supply of moisture is adequate, the response of crops to lime and fertilizer is fair. Fragments of chert interfere with tillage.

This soil is best suited to crops that tolerate periods of wetness. Under medium- or high-level management, it is well suited to Kentucky 31 fescue, Ladino clover, Korean lespedeza, and sericea lespedeza. Even under high-level management, yields of tobacco, corn, and small grain are usually low. Alfalfa is not well suited.

Severe droughtiness, chert fragments, and the erosion hazard are the main limitations if this soil is cultivated. On the relatively short slopes, erosion can be controlled by growing sod crops 4 years out of 6, cultivating on the contour, establishing grassed waterways, and leaving crop residue on the surface. On longer slopes, terracing or stripcropping is needed.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT IVw–1

This unit consists of a poorly drained Robertsville soil on stream terraces. This soil occupies nearly level areas or slight depressions. The plow layer is friable silt loam. A fragipan at a depth of 12 to 20 inches restricts internal drainage and limits the depth of the root zone. This soil is moderately low in moisture-supplying capacity and in natural fertilility and is strongly acid or very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The organic-matter content is low.

This soil is saturated in winter and in the early part of spring, and it may be ponded for short periods. Excessive wetness causes spring planting to be delayed and sometimes results in crop failure. The soil generally dries out and becomes droughty in midsummer.

Under high-level management, this soil is suited to Korean lespedeza and alsike clover. Under medium- or

high-level management, it is suited to Kentucky 31 fescue, redtop, Ladino clover, and Kobe lespedeza. Poor drainage limits its usefulness for row crops. It is occasionally used for corn and soybeans, but yields are low and crop failures are common. It is seldom used for tobacco or small grain.

The droughtiness of the soil, its low organic-matter content, and its shallowness above the fragipan limit its suitability, even if it is drained. Productivity is improved by draining the soil, growing sod crops 3 years out of 4, constructing diversions, and leaving crop residue on the surface.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT VIe-1

This unit consists of well-drained, moderately steep, cherty soils of the Baxter and Clarksville series. The slope range is 20 to 30 percent. The root zone is deep or moderately deep. These soils are moderately low or moderate in moisture-supplying capacity, moderate in natural fertility, and medium acid or strongly acid. The organic-matter content is low or medium.

The slope and the chert fragments hinder the operation of machinery. Maintenance of pastures may be impractical in some areas. The response of crops to lime and fertilizer is good.

These soils are not suited to cultivation, because of the slope and erosion hazard. They are better suited to permanent pasture or woodland. Under high-level management, they produce moderate yields of orchardgrass, redtop, timothy, and alfalfa. Under medium- or high-level management, they are well suited to Kentucky 31 fescue and sericea lespedeza.

The chief hazards if these soils are cultivated are runoff and erosion. Newly seeded pastures may be washed out by heavy rains and rapid runoff. Grazing should be controlled in established pastures. In order to limit the erosion hazard and promote the infiltration of water, all seeding operations should be on the contour.

This unit occupies about 6.2 percent of the county.

CAPABILITY UNIT VIe-2

This unit consists of well-drained, mainly cherty soils of the Baxter, Christian, and Cumberland series. The slope range is 6 to 20 percent. The root zone is deep or moderately deep. The Christian soil contains only a small amount of chert. These soils are low or moderately low in moisture-supplying capacity, moderately low or moderate in natural fertility, and medium acid or strongly acid. The organic-matter content is very low.

Chert, severe erosion, and strong slopes interfere with tillage. The response of crops to lime and fertilizer is fair.

These soils are best suited to pasture and wood crops. They are not suited to cultivation, because of the erosion hazard. Seedbed preparation is difficult because the organic-matter content is low and the surface layer is clayey and cherty. Under high- or medium-level management, these soils are well suited to Kentucky 31 fescue, redtop, and sericea lespedeza, but pasture capacity is limited, especially in dry periods. Orchardgrass, timothy, and alfalfa can be grown, but even under high-level management yields are usually low.

In order to limit the erosion hazard and promote infiltration of water, machinery should be operated only on the contour.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT VIe-8

This unit consists of somewhat excessively drained Dandridge and Westmoreland soils. These soils are shallow over bedrock. The surface layer is shaly silt loam. The root zone is shallow. The slope range is 12 to 20 percent. These soils are low in moisture-supplying capacity, moderately low in natural fertility, and slightly acid or neutral. The organic-matter content is medium. In places there are enough fragments of shale and other rock to interfere with machinery. The response of crops to lime and fertilizer is good.

These soils are not suited to cultivated crops, because of the hazard of erosion and because they are shallow, strongly sloping, and droughty. They are fairly well suited to pasture. Under high- or medium-level management, they are suited to Kentucky 31 fescue, redtop, and sericea lespedeza. Orchardgrass and red clover can be grown but require high-level management.

The chief hazards are runoff and erosion if these soils do not have protective cover.

This unit occupies about 1.5 percent of the county.

CAPABILITY UNIT VIs-1

This unit consists of well-drained soils of the Baxter, Talbott, and Christian series. These soils have a shallow or moderately deep root zone. Exposed rock and boulders cover as much as 10 percent of the surface. The slope range is 6 to 20 percent. These soils are moderate or moderately high in moisture-supplying capacity, moderately high in natural fertility, and medium acid or strongly acid. The organic-matter content is low.

Rock ledges, boulders, and chert interfere with tillage. The response of crops to fertilizer and lime is good.

These soils are not suited to cultivated crops; they are better suited to permanent pasture and woodland. Under medium- or high-level management, they are well suited to Kentucky 31 fescue and sericea lespedeza. Yields of these crops are usually favorable. Kobe lespedeza and Korean lespedeza can be grown but require high-level management. Moderate yields of alfalfa can be obtained in some areas.

Rockiness and the erosion hazard—where the soils do not have a protective cover—are the main limitations.

This unit occupies about 1.2 percent of the county.

CAPABILITY UNIT VIs-3

This unit consists of excessively drained cherty soils of the Bodine series. The slope range is 12 to 20 percent. This soil has a shallow or moderately deep root zone. It is moderately low in moisture-supplying capacity, low in natural fertility, and strongly acid or very strongly acid. The organic-matter content is low.

This soil is not suited to cultivation. It is suited to pasture or woodland. It can be worked for pasture seeding within a wide range of moisture content without clodding or crusting. Chert fragments interfere with tillage. Sericea lespedeza, Kentucky 31 fescue, and redtop are suited under high- or medium-level management, but yields are low in dry years. Orchardgrass and timothy

can be grown, but even under high-level management, yields are low and stands are short lived.

Chertiness, droughtiness, and the erosion hazard—if there is not protective cover—are the main limitations for this soil. Permanent pasture sod ordinarily controls erosion.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT VIIe-1

This unit consists of a well-drained, severely eroded, cherty Baxter soil that has a moderately deep root zone. The slope range is 20 to 30 percent. This soil is low in moisture-supplying capacity, moderately low in natural fertility, and medium acid or strongly acid. The organic-matter content is very low. The response of crops to lime and fertilizer is only fair.

This soil is not suited to cultivated crops. It is unsuited to many pasture crops. Kentucky 31 fescue, redtop, and sericea lespedeza can be established, but yields are often low. Wildlife habitats and woodland are the best uses for these soils. Upland oak and Virginia pine are well suited.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT VIIe-2

This unit consists of somewhat excessively drained soils of the Dandridge and Westmoreland series. These soils have a shallow root zone. The surface layer is shaly silt loam or shaly silty clay loam. The slope range is 20 to 50 percent. These soils are low in moisture-supplying capacity, low or moderately low in natural fertility, and slightly acid or neutral. The organic-matter content is low or medium. The response of crops to lime and fertilizer is fair.

These soils are not suitable for cultivated crops, because they are steep and shallow over bedrock and the use of farm machinery is not feasible. Kentucky 31 fescue, sericea lespedeza, and redtop can be grown for short-season pasture in a few areas, but in most places establishing pasture is difficult or impractical. Wildlife habitats and woodland are the best uses for these soils. Upland oak and redcedar are the best suited woodland species (fig. 19).

This unit occupies about 17.8 percent of the county.

CAPABILITY UNIT VIIe-4

This unit consists of moderately steep and steep upland areas characterized by an intricate pattern of moderately deep and deep gullies. Most of the soil material has been removed by severe sheet erosion. In places, narrow strips of soil between gullies are only moderately eroded, but in most areas the lower part of the subsoil or the parent material is exposed. The remaining soil material is generally high in clay content. It is reddish in most places but is grayish in some areas.

Much of the acreage was formerly cultivated or used for pasture, but most areas are reverting to woodland or are idle. A few small tracts have been reclaimed for pasture

Figure 19.—**Cedars and native hardwoods on severely eroded Westmoreland shaly silt loam.**

by extensive leveling with heavy machinery, fertilizing, and replanting. In most places, however, yields are too low to offset the cost of land preparation. Generally, these areas are suitable only for woodland or wildlife. Redcedar is becoming established in some areas; scrub oak and brush are growing up in places.

This unit occupies less than 1 percent of the county.

CAPABILITY UNIT VIIs-2

This unit consists of well-drained or excessively drained cherty or rocky soils of the Baxter, Talbott, Bodine, and Caneyville series. The slope range is 12 to 50 percent. Exposed rock and boulders cover as much as 10 percent of the surface. The depth of the root zone ranges from a few inches to 3 feet or more. These soils are low or moderate in moisture-supplying capacity, low or moderate in natural fertility, and medium acid to very strongly acid. The organic-matter content is medium to very low.

These soils are best suited to woodland and wildlife. Redcedar, pine, and black locust are suitable trees. Some areas can be used for short-season pasture, but yields are low and undependable. Kentucky 31 fescue and sericea lespedeza are the pasture plants most likely to survive, but even these are difficult to establish.

This unit occupies about 4.7 percent of the county.

CAPABILITY UNIT VIIs-5

This unit consists mainly of strongly sloping or moderately steep areas where limestone outcrops cover as much as 90 percent of the surface. Many areas are moderately eroded; a few areas are severely eroded. The soil between the outcrops is generally moderately fertile and is medium or high in organic-matter content. The subsoil is dominantly red and clayey.

Most of the areas are wooded, but a few areas are cleared and now are idle or support wild grasses. The numerous rock outcrops prevent the use of farm machinery and limit use of these areas to wildlife habitats and woodland. Redcedar is the most suitable wood crop, but potential yields are low.

This unit occupies less than 1 percent of the county.

Estimated Yields

Estimates of the average yield per acre of the principal crops grown in Metcalfe County, under two levels of management, are given in table 2.

The yields shown in columns A can be expected under a medium level of management that includes fertilization and the minimum treatment needed to keep the soils from deteriorating. Management at this level returns some profit.

The yields shown in columns B can be expected, without irrigation, under high-level management, which is defined as including the following:

1. Use of adapted, recommended crop varieties.
2. Proper rates of seeding and dates of planting, inoculation of legumes, and efficient harvesting methods.
3. Control of weeds, insects, and plant diseases.
4. Fertilization in accordance with recommendations of the Kentucky Agricultural Experiment Station or in accordance with the results of soil tests.
5. Adequate limiting.
6. Drainage of naturally wet soils, if feasible.
7. Cropping systems that help to control erosion, maintain structure, preserve tilth, and replenish the supply of organic matter.
8. Contour tillage, terracing, contour stripcropping, sodded waterways, minimum tillage, interseeding, and other applicable conservation practices.
9. Use of cover crops and crop residues to supply organic matter and help to control erosion.
10. Good management of pastures.

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

[Yields in columns A are to be expected under medium management; those in columns B are to be expected under high-level management. Absence of a figure indicates that the soil is not suited to that particular crop. Gullied land and Rock land are not suitable for any crops; therefore, no estimates are made]

Soil	Corn		Tobacco [1]	Wheat		Alfalfa-grass		Red clover (second year)		Lespedeza hay		Pasture	
	A	B	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Animal-unit-days* [2]	*Animal-unit-days* [2]
Baxter cherty silt loam, 2 to 6 percent slopes	57	86	1,820	21	32	2.1	3.2	2.1	3.0	1.2	1.8	105	175
Baxter cherty silt loam, 2 to 6 percent slopes, eroded	52	75	1,600	20	30	1.7	2.9	1.9	2.8	1.1	1.6	95	170
Baxter cherty silt loam, 6 to 12 percent slopes	56	83	1,700	21	31	1.9	3.1	1.9	2.9	1.1	1.6	95	170
Baxter cherty silt loam, 6 to 12 percent slopes, eroded	48	73	1,450	18	28	1.6	2.7	1.8	2.7	1.0	1.5	85	160
Baxter cherty silt loam, 12 to 20 percent slopes	53	80	1,450	20	30	1.7	2.9	1.8	2.8	1.0	1.5	95	165
Baxter cherty silt loam, 12 to 20 percent slopes, eroded	------	68	1,300	------	20	1.5	2.6	1.6	2.6	.9	1.4	85	155
Baxter cherty silt loam, 20 to 30 percent slopes	------	------	------	------	------	1.6	2.8	------	------	------	------	80	155

See footnotes at end of table.

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

Yields in columns A are to be expected under medium management; those in columns B are to be expected under high-level management. Absence of a figure indicates that the soil is not suited to that particular crop. Gullied land and Rock land are not suitable for any crops; therefore, no estimates are made]

Soil	Corn		Tobacco [1]	Wheat		Alfalfa-grass		Red clover (second year)		Lespedeza hay		Pasture	
	A	B	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Animal-unit-days* [2]	*Animal-unit-days* [2]
Baxter cherty silt loam, 20 to 30 percent slopes, eroded						1.4	2.5					80	150
Baxter cherty silty clay loam, 6 to 12 percent slopes, severely eroded		48			19	1.3	2.2	1.2	2.1	0.8	1.2	65	130
Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded						1.2	2.1					65	120
Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded												55	110
Baxter-Talbott rocky silt loams, 6 to 12 percent slopes, eroded						1.5	2.6			.8	1.2	80	158
Baxter-Talbott rocky silt loams, 12 to 20 percent slopes, eroded						1.5	2.6					80	152
Baxter-Talbott rocky silt loams, 20 to 30 percent slopes, eroded												70	140
Baxter-Talbott rocky silty clay loams, 12 to 20 percent slopes, severely eroded												55	120
Bodine cherty silt loam, 12 to 20 percent slopes												80	145
Bodine cherty silt loam, 20 to 35 percent slopes												65	125
Caneyville rocky complex, 20 to 30 percent slopes												60	110
Caneyville rocky complex, 20 to 30 percent slopes, severely eroded												40	75
Caneyville rocky complex, 30 to 50 percent slopes												40	88
Captina silt loam, 0 to 2 percent slopes	51	80	1,950	20	30	1.5	2.5	1.7	2.8	1.3	2.0	90	175
Captina silt loam, 2 to 6 percent slopes	51	80	2,000	20	30	1.5	2.5	1.7	2.8	1.3	2.0	90	170
Christian clay loam, 6 to 20 percent slopes, severely eroded						1.2	2.2			.9	1.5	55	120
Christian loam, 2 to 6 percent slopes	56	83	1,950	22	33	1.9	3.0	1.6	2.5	1.3	1.9	90	165
Christian loam, 6 to 12 percent slopes	56	82	1,950	20	30	1.9	3.0	1.6	2.5	1.3	1.9	85	160
Christian loam, 6 to 12 percent slopes, eroded	46	75	1,750	17	25	1.7	2.8	1.5	2.3	1.2	1.8	80	150
Christian loam, 12 to 20 percent slopes, eroded			1,400			1.5	2.6					65	130
Christian rocky soils, 12 to 20 percent slopes												55	115
Clarksville cherty silt loam, 2 to 6 percent slopes	48	70	1,700	22	30	2.1	3.4	1.9	3.0	1.1	1.8	90	160
Clarksville cherty silt loam, 6 to 12 percent slopes	45	68	1,600	17	25	1.9	3.2	1.9	2.9	1.1	1.7	85	150
Clarksville cherty silt loam, 6 to 12 percent slopes, eroded		55	1,300		20	1.8	3.0	1.7	2.7	1.0	1.6	75	140
Clarksville cherty silt loam, 12 to 20 percent slopes, eroded		55	1,200			1.7	2.9	1.6	2.6	1.0	1.6	70	135
Clarksville cherty silt loam, 20 to 30 percent slopes, eroded						1.6	2.7					70	130
Crider silt loam, 2 to 6 percent slopes	64	91	2,000	25	35	2.6	3.8	2.1	3.0	1.4	2.0	110	185
Crider silt loam, 2 to 6 percent slopes, eroded	52	84	1,950	22	33	2.2	3.5	2.0	2.8	1.2	1.9	90	180
Crider silt loam, 6 to 12 percent slopes, eroded	50	80	1,720	20	30	2.1	3.3	2.0	2.8	1.2	1.9	105	170
Cumberland cherty silt loam, 2 to 6 percent slopes	61	88	2,100	24	35	2.2	3.3	2.1	3.0	1.2	1.7	95	165
Cumberland cherty silt loam, 2 to 6 percent slopes, eroded	52	78	1,950	21	31	1.9	3.1	1.9	2.8	1.0	1.5	85	150
Cumberland cherty silt loam, 6 to 12 percent slopes, eroded	50	75	1,750	18	27	1.7	2.9	1.8	2.7	1.0	1.4	85	150
Cumberland cherty silt loam, 12 to 20 percent slopes, eroded		68	1,620		21	1.7	2.9	1.7	2.6	1.0	1.4	85	150
Cumberland cherty silty clay, 12 to 20 percent slopes, severely eroded						1.3	2.3					65	120

See footnotes at end of table.

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

[Yields in columns A are to be expected under medium management; those in columns B are to be expected under high-level management. Absence of a figure indicates that the soil is not suited to that particular crop. Gullied land and Rock land are not suitable for any crops; therefore, no estimates are made]

Soil	Corn		Tobacco [1]	Wheat		Alfalfa-grass		Red clover (second year)		Lespedeza hay		Pasture	
	A	B	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lb.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Animal-unit-days* [2]	*Animal-unit-days* [2]
Dandridge and Westmoreland shaly silt loams, 12 to 20 percent slopes						1.3	2.3			0.08	1.3	60	115
Dandridge and Westmoreland shaly silt loams, 20 to 50 percent slopes												40	75
Dandridge and Westmoreland shaly silty clay loams, 12 to 20 percent slopes, severely eroded												40	75
Dandridge and Westmoreland shaly silty clay loams, 20 to 50 percent slopes, severely eroded													
Dandridge and Westmoreland silt loams, 2 to 6 percent slopes			1,450		20	1.4	2.5	1.4	2.3	.9	1.4	65	130
Dandridge and Westmoreland silt loams, 6 to 12 percent slopes			1,350			1.3	2.4	1.3	2.1	.08	1.3	60	120
Dewey silt loam, 2 to 6 percent slopes	56	80	1,850	23	33	2.4	3.6	2.1	3.0	1.3	1.9	110	183
Dewey silt loam, 6 to 12 percent slopes, eroded	42	70	1,650	20	30	2.4	3.4	2.1	3.0	1.3	1.9	100	170
Dewey silt loam, 12 to 20 percent slopes, eroded		68	1,400	16	25	2.2	3.3	1.9	2.9	1.2	1.8	90	165
Dickson silt loam, 0 to 2 percent slopes	52	80	1,850	20	30	1.6	2.5	2.0	3.0	1.3	2.0	100	170
Dickson silt loam, 2 to 6 percent slopes	52	80	1,850	20	30	1.6	2.6	1.9	3.0	1.2	1.9	90	165
Dickson silt loam, 2 to 6 percent slopes, eroded	45	70	1,650	20	30	1.4	2.4	1.7	2.8	1.1	1.7	85	155
Dickson silt loam, 6 to 12 percent slopes, eroded	40	60	1,400	16	25	1.2	2.2	1.6	2.7	1.1	1.7	80	150
Elk silt loam, 2 to 6 percent slopes	73	100	2,200	29	40	2.6	3.9	2.1	3.0	1.4	2.0	110	185
Humphreys cherty silt loam, 2 to 6 percent slopes	48	75	1,650	20	30	2.2	3.4	2.0	3.0	1.3	1.8	90	170
Humphreys cherty silt loam, 6 to 12 percent slopes	45	70	1,400	19	30	2.1	3.2	2.0	2.9	1.3	1.8	90	165
Humphreys cherty silt loam, 6 to 12 percent slopes, eroded		60	1,200	16	25	1.8	3.0	1.7	2.7	1.1	1.7	85	155
Huntington gravelly silt loam	65	90	1,800	24	35	2.6	3.9	2.0	3.0	1.4	2.0	100	180
Huntington silt loam	80	110	2,200	32	45	2.8	4.0	2.1	3.0	1.4	2.0	115	195
Landisburg cherty silt loam, 6 to 12 percent slopes, eroded			1,200							.9	1.4	65	125
Landisburg silt loam, 2 to 6 percent slopes		55	1,600		20					1.1	1.7	80	155
Landisburg silt loam, 6 to 12 percent slopes, eroded		47	1,400		18						1.4	70	130
Lindside silt loam	65	100	2,000	20	35	2.1	3.5	2.0	3.0	1.3	2.0	110	195
Melvin silt loam	42	70	1,550							1.1	1.8	90	170
Mountview silt loam, 2 to 6 percent slopes	50	75	1,850	19	30	2.2	3.6	1.9	3.0	1.2	2.0	100	180
Mountview silt loam, 6 to 12 percent slopes, eroded		55	1,650		21	1.9	3.1	1.8	3.0	1.2	1.9	90	165
Muse silt loam, 6 to 12 percent slopes	50	80	1,800	19	29	2.0	3.2	1.9	3.0	1.0	1.8	90	160
Newark silt loam	53	86	1,750	19	28	1.8	3.1	1.6	2.5	1.2	1.8	105	185
Pembroke silt loam, 2 to 6 percent slopes	72	100	2,200	28	39	2.7	3.9	2.1	3.0	1.4	2.0	110	185
Pembroke silt loam, 6 to 12 percent slopes, eroded	62	87	1,900	27	38	2.3	3.4	2.1	3.0	1.4	1.9	95	170
Renox silt loam, 6 to 12 percent slopes	52	78	1,650	22	33	2.2	3.5	1.8	2.9	1.3	1.9	90	177
Robertsville silt loam										1.0	1.7	65	150
Robinsonville fine sandy loam	74	105	2,100	28	40	2.7	4.0	2.1	3.0	1.4	2.0	110	190
Sango silt loam, 0 to 2 percent slopes		62	1,840		20	1.3	2.2	1.6	2.5	1.1	1.7	70	150
Sango silt loam, 2 to 6 percent slopes	41	64	1,840		20		2.5	1.6	2.6	1.0	1.7	75	155
Taft silt loam		55	1,480							1.0	1.7	75	155
Talbott silt loam, 6 to 12 percent slopes	40	60	1,600	16	24	1.8	3.0	1.7	2.7	1.2	1.8	75	145
Talbott silty clay loam, 6 to 12 percent slopes, eroded		51	1,300		19	1.7	2.8	1.5	2.4	1.1	1.7	65	130

[1] Tobacco is a high-value crop and is nearly always grown under a high level of management. Yields under medium management are not estimated.

[2] The number of days that 1 acre will support one animal unit (one cow, one steer, or one horse; five hogs; or seven sheep or seven goats) without injury to the pasture.

Woodland [1]

Nearly all of Metcalfe County was originally covered by hardwood forest. The early settlers cleared and farmed much of the land. By 1962 less than half of the county, or about 77,000 acres, was privately owned woodland. Indiscriminate logging, forest fires, and overgrazing have substantially reduced the proportion of desirable trees. In the remaining stands most of the trees are of low or medium quality. Local markets are needed for hardwoods that are not suitable for lumber or veneer but can be used for small-dimension stock, pulpwood, or charcoal. Markets in nearby counties provide an outlet for top-quality yellow-poplar, oak, cherry, and black walnut.

[1] By WILLIAM M. MORRILL, woodland conservationist, Soil Conservation Service, and E. V. HUFFMAN, assistant State soil scientist, Soil Conservation Service.

Woodland groups

All of the soils in this county have been placed in woodland groups. Each group consists of soils that have about the same potential productivity and require similar conservation treatment. Table 3 shows, by woodland group, the suitability of the soils for wood crops in terms of their potential productivity and the species to favor. The ratings were arrived at by applying the results of published research (*2*, *3*, *6*, *7*, and *8*)[2] and unpublished field studies.[3]

The potential productivity of a soil for a specified kind of tree is expressed as a site index. The site index is the

[2] Italic figures in parentheses refer to Literature Cited, p. 81.

[3] The ratings for yellow-poplar are based on 1957 data assembled by W. T. DOOLITTLE, Forest Service, and those for redcedar are based on observations of plots in 1948 by the Tennessee Valley Authority.

TABLE 3.—*Suitability of the soils for wood crops*

[Dashed lines indicate data not available]

Woodland group	Potential productivity		Species to favor	
	Site indexes [1]	Estimated annual growth of sawtimber per acre [2]	In existing stands	For planting
		Board feet (international rule)		
Group 1	Upland oak, 86±6 Yellow-poplar, 94±7 Virginia pine, 75 to 85 Redcedar, 41±4	355 485	Yellow-poplar, black walnut, black cherry, white oak, and northern red oak.	Black locust, yellow-poplar, black walnut, white pine, shortleaf pine, and northern red oak.
Group 2	Upland oak, 60±3 Virginia pine, 65 to 75 Redcedar, 38±2	120	Black oak, southern red oak, white oak, and hickory.	Loblolly pine and shortleaf pine.
Group 3	Upland oak, 50 to 60 Redcedar, 30 to 35	70 to 120	Virginia pine, black oak, redcedar, and southern red oak.	Eastern redcedar.
Group 4	Upland oak, 71±3 Yellow-poplar, 75 to 85	205 275 to 385	Black oak, southern red oak, yellow-poplar, and hickory.	Loblolly pine, shortleaf pine, and white pine.
Group 5	Cottonwood, 100 to 110 Sweetgum, 94±6 Lowland oak, 94±4 Yellow-poplar, 107±5 Upland oak, 80 to 85	650 to 810 485± 440± 625± 290 to 345	Cottonwood, pin oak, sweetgum, and sycamore.	Cottonwood, sweetgum, pin oak, and yellow-poplar.
Group 6	Upland oak, 75±7 Yellow-poplar, 89±5 Eastern redcedar, 40 to 45	240± 430±	White oak, yellow-poplar, southern red oak, and red maple.	White pine, loblolly pine, shortleaf pine, and black locust.
Group 7	Pin oak, 98±5 Cottonwood, 100±4 Sweetgum, 93±6	485 645 475±	Cottonwood, pin oak, and sweetgum.	Cottonwood, pin oak, and sweetgum.
Group 8	Upland oak, 67±4	170±	Black oak, southern red oak, hickory, and redcedar.	Loblolly pine, shortleaf pine, and white pine.
Group 9	Upland oak, 75±2 Yellow-poplar, 96±7	240± 510±	Yellow-poplar, black walnut, black cherry, white oak, black oak, and sweetgum.	Yellow-poplar, black walnut, black locust, white pine, loblolly pine, and shortleaf pine.
Group 10	[3]	[3]	[3]	[3].

[1] Site index for all species except cottonwood based on height at 50 years of age; site index for cottonwood based on height at 30 years of age.

[2] Predictions are for well-stocked, even-aged, managed stands up to 60 years of age for all species except cottonwood; predictions for cottonwood are for stands up to 30 years of age. Yield data are from USDA Handbook 181 (*6*) and from tree-growth data from soil-site evaluations made by the Soil Conservation Service.

[3] See narrative discussion of woodland group 10.

average height, in feet, that the dominant and codominant trees growing on the specified soil will reach at a specified age. Many trees in this county and in adjacent areas were measured in the process of gathering data from which to determine the site index for wood crops. As nearly as possible, the studies were confined to well-stocked, naturally occurring, even-aged, essentially unmanaged stands that had not been adversely affected by fire, insects, or disease and had not been grazed to a damaging extent.

Table 3 gives the average site index of important species of trees on the soils of each group and estimates of annual production of sawtimber calculated from the site index. The table also lists the species that ought to be favored in managing existing stands and in planting.

The narrative discussion of woodland groups describes the soils in each group and examines hazards and limitations in their use for wood crops.

Woodland can be protected from erosion by varying the rotation age and adjusting the cutting cycles; by taking care in constructing and maintaining roads, trails, and landings; and by using special techniques in management.

Erosion hazard is rated according to the risk of erosion on well-managed woodland that is not protected by special practices. It is assumed that the woodland is protected from fire and overgrazing. Generally, the erosion hazard is *slight* if the slope is 6 percent or less, *moderate* if the slope is 6 to 12 percent, and *severe* if the slope is more than 12 percent. In some cases specific soil characteristics necessitate departure from these general guidelines.

Certain topographic features and soil characteristics, such as slope, drainage, soil texture, stoniness, and rocks and ledges, may restrict the use of conventional wheel or track-type equipment for harvesting and planting wood crops, for constructing roads, for controlling fire, and for controlling unwanted vegetation. Topographic conditions or differences in soils may necessitate the use of different kinds of equipment and methods of operation. These differences may also necessitate varying the season when equipment is used. Generally, the limitation is *slight* if the slope is 12 percent or less and farm machinery can be operated efficiently without construction and maintenance of permanent roads and truck trails. The rating is *moderate* if the slope is 12 to 30 percent, if the use of ordinary farm machinery is limited, and if track-type equipment is necessary for efficient harvesting. The rating is *severe* if the slope is more than 30 percent and if track-type equipment is not adequate for harvesting and power winches and other special equipment are needed.

The equipment limitation is *moderate* if wetness prevents the use of conventional wheel or track-type equipment for 2 or 3 months a year. It is *severe* if wetness prevents the use of such equipment for 3 months or more in a year.

Unwanted trees, vines, shrubs, and other plants invade a site when openings are made in the canopy. This competition hinders the establishment and normal development of desirable seedlings, whether they occur naturally or are planted. Plant competition is *slight* if unwanted plants do not prevent adequate natural regeneration, interfere with early growth, or restrict the normal development of planted stock. Competition is *moderate* if unwanted plants delay establishment and hinder the growth of either planted stock or naturally regenerated seedlings, or if they retard the eventual development of a fully stocked stand. Competition is *severe* if unwanted plants prevent adequate restocking, either by natural regeneration or by planting, without intensive site preparation or special maintenance practices.

Some loss of seedlings is expected if soil characteristics or topographic features are unfavorable, even though plant competition is not a factor. Seedling mortality is *slight* if the expected loss is no more than 25 percent of the number needed to provide optimum stocking. Mortality is *moderate* if the expected loss is between 25 and 50 percent; it is *severe* if the expected loss is more than 50 percent. If the rating is *moderate* or *severe*, replanting is likely to be needed to insure a fully stocked stand, and special preparation of the seedbed and special planting techniques are often necessary.

The ten woodland groups in this county are discussed in the following pages.

WOODLAND GROUP 1

This group consists of deep, well drained and moderately well drained soils on the uplands. These are soils of the Baxter, Christian, Clarksville, Crider, Cumberland, Dewey, Dickson, Mountview, and Pembroke series. They are underlain predominantly by limestone. They are level to steep and are slightly to moderately eroded. Their potential productivity is high for upland oak, yellow-poplar, Virginia pine, and redcedar. Intensive management is justifiable.

The erosion hazard is slight on slopes of less than 6 percent. It is moderate on slopes ranging from 6 to 12 percent and severe on slopes of more than 12 percent. Careful attention must be given to the location, construction, and maintenance of roads and skid trails, especially where the slope is more than 12 percent.

Equipment limitations are slight on slopes of less than 2 percent and moderate on slopes of more than 12 percent. Track-type equipment is needed for harvesting timber where the slope is more than 20 percent.

Plant competition is severe, mainly because the amount of moisture available to plants during the growing season is favorable. Shade-tolerant trees of low quality usually become established in the understory of saw-log stands. After the saw logs are harvested, competition from these low-quality trees interferes with natural regeneration of desirable trees. Intensive weeding is usually necessary to control competing vegetation. Normally, interplanting or conversion planting is not feasible, largely because plant competition is severe. As a rule, trees planted in open fields require at least one cultivation.

Seedling mortality is slight.

WOODLAND GROUP 2

This group consists of somewhat excessively drained soils on the uplands. These are soils of the Caneyville, Christian, Dandridge, and Westmoreland series. They are underlain predominantly by limestone, shale, and sandstone. They are sloping to steep and are slightly eroded. Their potential productivity is fair for upland oak, Virginia pine, and redcedar. Only moderately intensive management is justifiable.

The erosion hazard is severe, mainly because of the slope. Gullies form readily where water concentrates. Careful attention must be given to the location, construction, and maintenance of roads and skid trails.

Equipment limitations are moderate or severe, mainly because of rocks and steep, rough slopes. Track-type equipment and power winches are necessary for harvesting timber on the steeper slopes.

Plant competition is only moderate, because the soil-moisture relationship during the growing season is somewhat unfavorable. Shade-tolerant trees of low quality often become established in the understory of saw-log stands. After the overstory has been logged, competition from the shade-tolerant trees interferes with natural regeneration of desirable trees unless the site is weeded at least once. Plant competition is moderate on land that has been idle more than 3 years after having been used for cultivated crops or pasture.

Seedling mortality is moderate or severe during periods of drought early in the growing season. These dry periods generally last 2 or 3 weeks. Naturally generated seedlings grow too slowly to provide protective cover.

WOODLAND GROUP 3

This group consists of moderately deep to shallow, somewhat excessively drained soils on the uplands. These are soils of the Baxter, Caneyville, Christian, Cumberland, Dandridge, Talbott, and Westmoreland series. They are underlain predominantly by limestone and shale. They are strongly sloping to steep and are severely eroded. Their potential productivity is fair for redcedar and low for all other species. Generally, only low-level management is justifiable.

The erosion hazard is moderate on slopes of less than 12 percent. It is severe on slopes of more than 12 percent. Gullies form readily where water concentrates. Careful attention needs to be given to the location, construction, and maintenance of roads and skid trails, especially if the slope is more than 12 percent.

Equipment limitations are moderate on slopes of less than 12 percent and severe on slopes of more than 12 percent, mainly because the surface is rough and rocky. Generally, track-type equipment and power winches are necessary for harvesting timber efficiently.

Plant competition is slight.

Seedling mortality is severe during periods of drought early in the growing season. These dry periods generally last 2 or 3 weeks and cause moderate or severe loss of newly planted stock. Naturally generated seedlings grow too slowly to provide protective cover.

WOODLAND GROUP 4

This group consists of moderately deep, somewhat excessively drained, cherty Bodine soils on uplands. These soils are underlain by chert beds over limestone bedrock. They are sloping to steep and are not eroded. Their potential productivity is moderately high for oak and fair for yellow-poplar. Moderately intensive management is justifiable.

The erosion hazard is moderate on slopes ranging from 12 to 20 percent and severe on slopes of more than 20 percent. The hazard of gully erosion is severe, especially on the steeper slopes. Careful attention must be given to the location, construction, and maintenance of roads and skid trails.

Equipment limitations are moderate on slopes ranging from 12 to 30 percent, and the use of farm machinery is not always feasible. Equipment limitations are severe on slopes of more than 30 percent. Track-type equipment and power winches are necessary for harvesting timber on the steeper slopes.

Plant competition is moderate or severe because soil-moisture relationships are favorable during the growing season. Shade-tolerant trees of low quality usually become established in the understory of saw-log stands. After the overstory has been logged, competition from the shade-tolerant trees interferes with natural regeneration of desirable trees. Usually, at least one weeding is necessary to assure survival of desirable seedlings. Generally, interplanting or conversion planting is not feasible. Plant competition is severe in open fields that have been idle more than 2 years after having been used for cultivated crops or pasture.

Seedling mortality is slight.

WOODLAND GROUP 5

This group consists of deep, well-drained, nonacid soils on flood plains and terraces along streams. These are soils of the Elk, Huntington, Lindside, and Robinsonville series. They are nearly level to sloping. Their potential productivity is high. Hardwoods, such as yellow-poplar and upland oak, grow rapidly on the areas that are not subject to frequent or prolonged flooding. The erosion hazard is slight.

Equipment limitations are moderate because of the seasonal overflow, which prevents the use of equipment for a period of about 2 months out of the year.

Plant competition is severe because the amount of moisture available to plants during the growing season is favorable. Undesirable plants, including shade-tolerant trees of low quality, easily become established in the understory of saw-log stands. After the overstory has been logged, competition from these low-quality trees interferes with natural regeneration of desirable trees. Intensive weeding is necessary to control competing vegetation. Generally, interplanting or conversion planting is not practicable. Trees planted in open fields require at least one cultivation during the first year.

WOODLAND GROUP 6

This group consists of moderately deep, moderately well drained soils on stream terraces. These are soils of the Captina, Landisburg, and Sango series. They are underlain by alluvial material derived mainly from limestone and shale. They are level to sloping and are not eroded. Their potential productivity is moderately high for upland oak, yellow-poplar, and redcedar. Intensive management is justifiable.

The erosion hazard is slight if slopes are less than 6 percent. It is moderate if slopes exceed 6 percent. Careful attention must be given to the location, construction, and maintenance of roads and skid trails.

Equipment limitations are slight, but plant competition is severe because the amount of moisture available to plants is favorable during the growing season. Shade-tolerant trees of low quality usually become established in the un-

derstory of saw-log stands. After the overstory has been logged, competition from these shade-tolerant trees interferes with natural regeneration of desirable trees. Usually, at least one weeding is necessary to assure survival of desirable seedlings. Generally, interplanting or conversion planting is not practicable. Plant competition is severe in open fields that have been idle more than 2 years after having been used for cultivated crops or pasture. Seedling mortality is slight.

WOODLAND GROUP 7

This group consists of level, somewhat poorly drained and poorly drained soils on bottom lands and stream terraces. These are soils of the Melvin, Newark, Robertsville, and Taft series. Their potential productivity is high for pin oak, cottonwood, and sweetgum. Intensive management is justifiable.

The erosion hazard is slight. These soils are flooded, however, for periods of more than 3 months a year, and equipment limitations are severe.

Plant competition is severe because the amount of moisture available to plants during the growing season is favorable. Undesirable plants, including shade-tolerant trees of low quality, become established in the understory of saw-log stands. After the overstory has been logged, competition from these low-quality trees interferes with natural regeneration of desirable trees. Intensive weeding is necessary to control the competing vegetation. Generally, interplanting or conversion planting is not practicable. Plant competition is severe in open fields that have been idle 2 years or more, after having been used for cultivated crops and pasture, unless the soils are cultivated at least once during the first year. Seedling mortality is slight.

WOODLAND GROUP 8

This group consists of moderately deep, well-drained Talbott soils, which have a subsoil of plastic clay. These soils formed in material weathered from limestone. They are sloping to steep and slightly eroded or moderately eroded. Their potential productivity is fair. Only moderately intensive management is justifiable.

The erosion hazard is severe. Gullies form readily. Careful attention must be given to the location, construction, and maintenance of roads and skid trails on the steeper slopes, to prevent concentration of runoff.

Equipment limitations are moderate on slopes of less than 12 percent and severe on slopes of more than 12 percent. Track-type equipment and power winches are necessary for harvesting timber on the steeper slopes.

Plant competition is severe because the amount of moisture available to plants during the growing season is favorable. Shade-tolerant trees of low quality become established in the understory of saw-log stands. After the saw logs are harvested, competition from these low-quality trees interferes with natural regeneration of desirable trees. Usually, at least one weeding is necessary to assure survival of desirable seedlings. Generally, interplanting or conversion planting is not feasible because of the need for weeding. Plant competition is severe in open fields that have been idle more than 2 years after having been used for cultivated crops or pasture. Seedling mortality is slight.

WOODLAND GROUP 9

This group consists of deep, well-drained soils on stream terraces. These are soils of the Humphreys, Muse, and Renox series. They are gently sloping or sloping and are slightly eroded. Their potential productivity is high for upland oak and yellow-poplar. Intensive management is justifiable.

The erosion hazard is slight, and equipment limitations are slight.

Plant competition is severe because the amount of moisture available to plants during the growing season is favorable. Shade-tolerant trees of low quality usually become established in the understory of saw-log stands. After the overstory has been logged, competition from the shade-tolerant trees interferes with natural regeneration of desirable trees unless the site is weeded at least once. Usually, interplanting or conversion planting is not feasible because of the need for weeding. Plant competition is severe in open fields that have been idle more than 2 years after having been used for cultivated crops or pasture. Seedling mortality is slight.

WOODLAND GROUP 10

This group consists of miscellaneous land types that vary in origin and physiography. Soil profiles have been altered to a degree that the soil material cannot be identified. The moisture-supplying capacity and other soil characteristics vary, and on-site examination is necessary before specific interpretations are made. The soils vary in their behavior and in their requirements for conservation treatment.

Gullied land consists of areas where more than 20 percent of the surface is scarred with deep or moderately deep gullies superimposed on very severe sheet erosion of the entire area. The subsoil material is exposed, and its characteristics vary. The potential productivity is very low. Shortleaf pine, loblolly pine, and Virginia pine can be planted in places where enough soil material to support trees is left and the soil is acid enough for conifers. The slowly growing trees will provide ground cover and protection from further erosion. Eastern redcedar will grow where the soil material is limy, if raw marl is not exposed. The limited supply of moisture and the active erosion contribute to severe seedling mortality. Plant competition is slight. The erosion hazard is very severe, and the use of equipment is severely restricted.

Rock land consists of areas where outcrops of limestone and calcareous shale cover 25 to 90 percent of the surface. The soil between the outcrops is shallow or very shallow, and the moisture-supplying capacity is low or very low. Potential productivity is low. The existing stands consist of redcedar and low-quality oak, and they are generally sparse. Eastern redcedar can be planted where there is enough soil material to support trees, but management is hardly worthwhile. The erosion hazard and the equipment limitations are severe. Seedling mortality is severe, and plant competition is variable.

Wildlife [4]

The kinds of wildlife in Metcalfe County and their relationship to the soil associations are discussed in this section.

The Cumberland-Crider association is mainly a gently sloping to strongly sloping karst area. Nearly 95 percent of it is used for corn, tobacco, small grain, and pasture. Most of the few hardwood woodlots scattered throughout the association are no more than 5 acres in size. The principal kinds of wildlife on this association are mourning dove, bobwhite quail, and cottontail rabbit. They are rather generally distributed. The intensive cultivation of the soils in this association provides a plentiful food supply. The fence rows make good cover for quail.

The Melvin-Crider association and the Baxter-Crider-Clarksville association support similar kinds of wildlife. The Melvin-Crider association is a level or gently sloping area. The Baxter-Crider-Clarksville association occupies broad, nearly level ridges and short side slopes. Most of the acreage of the Melvin and Clarksville soils is in hardwood forest. Most of the acreage of the Baxter and Crider soils and of the minor soils is used for corn, tobacco, small grain, hay, and pasture. The principal kinds of wildlife on these two associations are cottontail rabbit, bobwhite quail, gray squirrel, raccoon, opossum, and, in some spots, mourning dove. Rabbits, quail, and doves thrive best in the cultivated areas. Gray squirrels, raccoons, and opossums thrive best in the forested areas.

The Dandridge-Westmoreland-Christian association and the Dandridge-Westmoreland-Caneyville-Baxter association support similar kinds of wildlife. The Dandridge-Westmoreland-Christian association is a steep or very steep, hilly area that has very narrow ridgetops. The Dandridge-Westmoreland-Caneyville-Baxter association is a steep, hilly, dissected area that has narrow to moderately wide ridgetops. Most of the steeper areas of Dandridge and Westmoreland soils are in hardwood forest. Much of the acreage of the Caneyville soils has been taken out of cultivation and is either used for pasture or has been abandoned and is reverting to woodland. The Baxter and Christian soils on ridgetops and the minor soils on bottom lands and foot slopes are used mostly for cultivated crops. The principal kinds of wildlife on these two associations are opossum, raccoon, gray squirrel, bobwhite quail, cottontail rabbit, white-tailed deer, muskrat, mink, and red fox. Opossums, raccoons, and gray squirrels are most numerous in the extensive forests on Dandridge and Westmoreland soils. Quail, rabbits, white-tailed deer, and red foxes thrive best on Caneyville soils, especially in brushy areas that separate the cultivated Baxter and Christian soils on ridgetops from the wooded Dandridge and Westmoreland soils on lower slopes. Muskrats and mink are to be found principally along streams.

Soils in Engineering [5]

Engineering deals with soils as structural material and as foundation material upon which structures are built. Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, building foundations, pipelines, facilities for water storage, sewage-disposal systems, erosion-control and flood-control structures, drainage systems, and other engineering structures. The properties most important to engineers are permeability to water, shear strength, compaction characteristics, drainage, shrink-swell characteristics, grain size, plasticity, and degree of acidity or alkalinity. Topography, depth to water table, and depth to bedrock are also important.

Information in this report can be used to—

1. Make soil and land use studies that will aid in selecting and developing residential, business, industrial, and recreational sites.
2. Make preliminary estimates of soil properties that are significant in the planning of soil and water conservation systems, including surface and internal drainage, and of water-storage and water-supply systems.
3. Make preliminary evaluations of ground and soil conditions that will aid in selecting locations for highways, airports, pipelines, and cables, and in planning detailed investigations at the selected locations.
4. Locate probable sources of sand and gravel for use in construction.
5. Correlate performance of engineering structures with types of soil, to develop information that will be useful in planning the design and maintenance of engineering structures.
6. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates for construction purposes pertinent to a particular area.
8. Supplement other published information, such as maps, aerial photographs, and reports, in preparation of engineering reports for a specific area or areas.

With use of the soil map for identification, the engineering interpretations reported here can be useful for many purposes. It should be emphasized that they may not eliminate the need for sampling and testing at the site of specific engineering works that involve heavy loads or require excavations deeper than the depths of layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some terms used by soil scientists may not be familiar to engineers or to others who will use this part of the soil survey report, and some soil science terms may have different meanings in engineering and related fields. The Glossary at the back of the report defines many special terms as they are used in soil science. Other parts of the report, particularly the section "Descriptions of the Soils," gives information that is useful to engineers in evaluating the engineering properties of soils in a particular area.

Agricultural and Engineering Classifications of the Soils

The system of soil classification used by the U.S. Department of Agriculture is primarily for agricultural use. It

[4] By WILLIAM H. CASEY, biologist, Soil Conservation Service.
[5] By WILLIAM M. ADAMS, civil engineer, Soil Conservation Service.

is helpful to engineers, however, because it classifies soil material according to texture. Of primary importance in this system is the relative proportion of the various-sized individual grains in a mass of soil. Textural classes are based on different combinations of sand (2.0 millimeters to 0.5 millimeter in diameter), silt (0.05 to 0.002 millimeter), and clay (less than 0.002 millimeter). The basic classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, and clay. Sands are further identified as very coarse, coarse, fine, and very fine. Soils containing gravel up to 3 inches in diameter are gravelly; soils containing stones more than 10 inches in diameter are stony; soils containing flattened fragments of shale less than 6 inches along the longer axis are shaly; and soils containing relatively thin fragments of sandstone, limestone, slate, or shale, 6 to 15 inches long, are flaggy.

The Unified soil classification system (*12*) developed by the U.S. Army Corps of Engineers and the Bureau of Reclamation, is based on the identification of soils according to texture, plasticity, and performance as engineering construction material. The characteristics that form the basis of the classification are (1) percentage of gravel, sand, and fines,[6] (2) grain-size distribution, and (3) plasticity and compressibility characteristics.

In this system, soils are classified primarily as coarse grained, fine grained, or highly organic.

Coarse-grained soils are more than 50 percent material that is retained on a No. 200 sieve. They are subdivided into gravel (symbol G) and sand (symbol S). If the greater part of the coarse fraction retained on the No. 200 sieve is also retained on the No. 4 (4.76 millimeters) sieve, the soil is classed as gravel. If the greater part of the coarse fraction passes through the No. 4 sieve, the soil is classed as sand. The gravel and sand groups are each divided into four secondary groups, as follows: well-graded material (symbol W), poorly graded material (symbol P), coarse material with nonplastic fines (silty material) (symbol M), and coarse material with plastic fines (clayey material) (symbol C). Thus, a well-graded gravel is designated by the symbol GW, and a well-graded sand by the symbol SW; a poorly graded gravel is GP, and a poorly graded sand is SP; a silty gravel is GM, and a silty sand is SM; a clayey gravel is GC, and a clayey sand is SC. Fine-grained soils are more than 50 percent material that passes through the No. 200 sieve. They are subdivided into inorganic silt (symbol M), inorganic clay (symbol C), and organic silt or clay (symbol O). These groups are further subdivided on the basis of the liquid limit; symbol L is used for soils with a low liquid limit (50 or less), and symbol H for soils with a high liquid limit (more than 50). Thus, the groups that evolve are identified as ML, CL, and OL, and MH, CH, and OH.

The system of classifying soils that is used by the American Association of State Highway Officials (AASHO) (*1, 5*) is based on field performance of soils in highways. Soils of about the same general load-carrying capacity and service are grouped together. In this system soil materials are classified in seven principal groups. The groups range from A–1, which consists of gravelly soils of high bearing capacity, to A–7, which consists of clayey soils that have low strength when wet. Within each group, the relative engineering value of the soil material is indicated by a group index. Group indexes range from 0 for the best material to 20 for the poorest. Increasing values of the group index reflect decreasing load-carrying capacity of the subgrade, increasing liquid limit and plasticity index, and decreasing percentage of coarse material. The group index is shown in parentheses following the soil group symbol, for example, A–4 (1).

The seven basic groups are divided into two major classes: granular materials (35 percent or less of the material passes through the No. 200 sieve) and silt-clay materials (more than 35 percent of the material passes through the No. 200 sieve). Whether a soil is silty or clayey depends on its plasticity index (P.I.). Fine material having a P.I. of 10 or less is silty, and fine material having a P.I. of more than 10 is clayey. Five textural soil fractions are recognized: boulders, gravel, coarse sand, fine sand, and combined silt and clay.

Granular materials are classified in the A–1, A–2, and A–3 groups. A–1 soils are well-graded, coarse-textured to fine-textured mixtures that have nonplastic or slightly plastic soil binder. A–2 soils are poorly graded, have inferior soil binder, or both. A–3 soils are sands deficient in soil binder and coarse material.

Silt-clay materials are classified in the A–4, A–5, A–6, and A–7 groups. A–4 soils consist mostly of silt and contain only moderate or small amounts of coarse material and only small amounts of sticky colloidal clay. When dry, they provide a firm riding surface with little rebound after loading. When water is absorbed rapidly, they expand and lose stability. These soils are subject to frost heave. A–5 soils are similar to A–4 soils, except that they include very poorly graded soils that have elastic properties and very low stability. A–6 soils consist mostly of clay and contain moderate or small amounts of coarse material. They have good bearing capacity when compacted to maximum practical density but lose this bearing capacity when moisture is absorbed. A–7 soils also consist mostly of clay, but they have a higher liquid limit than A–6 soils. They may be elastic and undergo high volume changes. At certain moisture contents, they deform quickly under load and rebound when load is removed.

Table 4 shows the estimated classification of all soils in the county according to the three systems.

Soil Properties and Engineering Interpretations

Table 4, which begins on page 52, gives brief descriptions of the soils, by series, and estimates of the soil properties that are significant in engineering. Following are brief explanations of those terms used in table 4 that are not self-explanatory.

Seasonal high water table refers to the highest annual level of the ground water. Generally the ground water is at this level late in winter and early in spring.

Permeability, as used in this table, relates only to the movement of water downward through the undisturbed soil. The rates are based on estimates made by soil scien-

[6] Fines are particles that will pass through a No. 200 (0.074 millimeter) sieve. They are about the smallest particles visible to the naked eye.

tists familiar with the properties of the soils.

Available water is that part of the water in the soil that is obtainable by plants and can be taken up by them at rates significant to their growth. The estimates of capacities are based on experiments made on soils in Tennessee and Kentucky.

Shrink-swell potential is that quality of a soil that determines its volume change with change in moisture content. It depends largely on the amount and type of clay in a soil and the organic-matter content. Other factors that affect the shrink-swell potential of disturbed soils are the initial moisture content, dry density, degree of compaction, and amount of confining pressure.

Table 5, which begins on page 58, presents estimates of the suitability of the soils for certain engineering purposes and of their limitations for other uses and describes briefly some of the characteristics that affect the use of the soils in highway and agricultural engineering. In this table, the term "frost heave" refers to heaving caused by the formation of ice lenses in soils and to the subsequent loss of strength as a result of excess moisture when the ice thaws. The ratings for suitability as a source of road fill are based on the assumption that the soils are not subject to frost action. The degree of limitation for use as a building location refers to residences and service buildings no more than two stories high and having basements no more than 6 feet deep. A rating of severe for use as a building location or as a sewage-disposal field does not imply that a soil cannot be used for these purposes but indicates that the problems encountered in such use will be relatively serious.

Genesis, Classification, and Morphology of the Soils

This section describes the major factors of soil formation as they exist in Metcalfe County; discusses briefly the principal factors of soil formation; provides detailed descriptions of soil profiles to illustrate the morphology of the soils that have developed in the county; and shows how the soils of the county are classified into categories broader than the series.

Formation of the Soils

The major factors in soil development are parent material, climate, plant and animal life, topography, and time. All five of these factors come into play in the formation of every soil. The relative importance of each factor differs from place to place, and each modifies the effect of the other four. In some cases one factor may dominate the formation of a soil.

Parent material

Parent material (*11*) is the unconsolidated mass from which a soil is formed. The chemical and mineralogical composition of a soil is determined largely by the type of rocks from which its parent material was derived. Nearly all of the soils in this county developed in material weathered from local rock formations or in alluvium washed from soils derived from the rock formations. A few upland soils are capped by loess.

The following examples illustrate the relationship between soils, parent material, and bedrock. The chert fragments that are common in Baxter and Bodine soils were inherited from parent material that weathered from cherty limestone. Talbott soils have a plastic, clayey subsoil because they formed in parent material weathered from limestone high in clay content. The Robinsonville soils have a sandy texture because they formed in deposits of sand-sized material weathered from limestone, sandstone, and shale. The Crider soils have two kinds of parent material. The upper part of the Crider soils is brown and silty because it formed in silty, wind-deposited material. The lower part is yellowish red and more clayey because it formed in material weathered from limestone. Many of the differences among the soils of this county can be understood if the source and origin of the parent materials are known.

Climate

Climate affects the physical, chemical, and biological relationships in a soil. Water supports biological activity and transports soluble material, minerals, and organic residue downward through the soil profile. The amount of water that percolates through the soil is dependent upon the amount and intensity of rainfall, the temperature, the slope, the rate of infiltration, and the permeability of the soil.

The soils in this county formed under a humid, temperate climate. Temperature and rainfall were ideal for the growth of trees and for nearly continuous weathering of rocks and minerals. In this kind of climate the soils are moist and subject to leaching most of the year, except for occasional dry periods in summer. As a result, practically all of the soils are strongly acid.

Climate has aided in development of many of the soils through the process of podzolization. In this process water percolates downward through the soil profile and carries soluble material and fine particles into lower horizons, or out of the soil altogether. In this way the soluble bases, such as calcium and magnesium, clay minerals, and compounds of iron and aluminum, move downward from the soil surface. Normally, soils developed through this process have a leached, acid surface layer over a subsoil in which clay has accumulated. The Crider and Dewey series are examples of soils that have been influenced by climate through the process of podzolization.

Plant and animal life

The native vegetation consisted mainly of hardwood trees, such as oak, poplar, maple, hickory, and walnut. Trees take up large amounts of calcium and other bases from the soil. These are returned to the soil in the form of leaves and litter. Bacteria, fungi, and other microorganisms aid in the decay of this organic matter. Acids produced during the process of decay help to speed mineral decomposition, and consequently, the soils are generally low in bases. Most of the soils in the county have characteristics of soils developed under forest. They have thin horizons of organic-matter accumulation, they are acid throughout, and they have A2 horizons where undisturbed.

The larger plants serve to alter the microclimate of the soil. They are effective in reducing the rate of surface runoff, and they slow down the rate at which surface soil is moved by erosion.

TABLE 4.—*Brief descriptions of the soils and*

Soil series and map symbols	Brief description	Depth from surface	Classification: USDA texture
		In.	
Baxter (BaB, BaB2, BaC, BaC2, BaD, BaD2, BaE, BaE2, BcC3, BcD3, BcE3).	Well-drained upland soils that are extensive and occur in most parts of the county. Depth to bedrock 3 to 10 feet. Depth to seasonal high water table more than 3 feet. No flood hazard.	0 to 9	Cherty silt loam
		9 to 14	Cherty silty clay loam
		14 to 20	Cherty silty clay loam
		20 to 28	Plastic cherty silty clay
		28 to 40	Cherty silty clay or silty clay loam.
Baxter-Talbott complexes (BeC2, BeD2, BeE2, BfD3).	Baxter: See description of Baxter soils. Talbott: See description of Talbott soils.		
Bodine (BoD, BoE)	Excessively drained upland soils that are widely distributed in the central and southern parts of the county. Flaggy chert beds just above bedrock. Depth to bedrock (thin layer of sandstone) 1½ to 3 feet. Depth to seasonal high water table more than 3 feet. No flood hazard.	0 to 7	Cherty silt loam
		7 to 18	Cherty silt loam
		18 to 23	Cherty silty clay loam
Caneyville (CaE, CaE3, CaF)	Well-drained upland soil, mostly in the extreme eastern and northeastern parts of the county. Limestone outcrops cover 2 to 25 percent of the surface. Depth to bedrock 1½ to 3 feet. Depth to seasonal high water table 1 foot to 2 feet. No flood hazard.	0 to 7	Loam
		7 to 24	Silty clay
		24 to 28	Sandy clay
		28 to 34	Silty clay
Captina (CbA, CbB)	Moderately well drained terrace soils of moderate total acreage but widely distributed in the county. Fragipan at a depth of about 24 to 30 inches. Stratified silt, clay, sand, and waterworn pebbles at a depth of about 42 inches. Depth to bedrock more than 5 feet. Depth to seasonal high water table 1½ to 2 feet. Infrequent flooding.	0 to 8	Silt loam
		8 to 16	Silt loam
		16 to 24	Silty clay loam
		24 to 30	Silt loam or silty clay loam
		30 to 42	Silty clay loam
Christian (CcD3, CdB, CdC, CdC2, CdD2, CeD).	Well-drained upland soils; widely distributed throughout the county. The rocky soils (CeD) have rock outcrops over 10 to 25 percent of area. Depth to bedrock 4 to 6 feet. Depth to seasonal high water table more than 3 feet. No flood hazard.	0 to 8	Loam or clay loam
		8 to 14	Loam or clay loam
		14 to 32	Silty clay
		32 to 51	Silty clay loam
Clarksville (CkB, CkC, CkC2, CkD2, CkE2).	Well-drained upland soils that occur mainly in the central and southern parts of the county. Beds of chert at depth of 2½ to 5½ feet. Depth to bedrock 4 to 10 feet. Depth to seasonal high water table 3 to 9 feet. No flood hazard.	0 to 12	Cherty silt loam
		12 to 24	Cherty silty clay loam
		24 to 38	Cherty silty clay loam
Crider (CrB, CrB2, CrC2)	Well-drained upland soils; extensive in the county. Small fragments of chert in 24- to 37-inch layer. Depth to bedrock 5 to 10 feet. Depth to seasonal high water table more than 4 feet. No flood hazard.	0 to 14	Silt loam
		14 to 24	Silty clay loam
		24 to 37	Silty clay loam
		37 to 40	Silty clay loam
Cumberland (CuB, CuB2, CuC2, CuD2, CvD3).	Well-drained upland soils of moderate acreage that occur mainly in the northwestern part of the county. A few outcrops of bedrock. Depth to bedrock 5 to 15 feet. Depth to seasonal high water table more than 4 feet. No flood hazard.	0 to 7	Cherty silt loam
		7 to 11	Cherty silty clay loam
		11 to 34	Cherty clay
		34 to 46	Cherty silty clay
		46 to 50	Cherty clay
Dandridge and Westmoreland undifferentiated groups (DaD, DaF, DbD3, DbF3, DcB, DcC).	Excessively drained upland soils. Widely distributed, but mostly in the eastern fourth of the county. Depth to limestone bedrock 1 foot to 2½ feet. Depth to seasonal high water table more than 3 feet. No flood hazard.	0 to 7	Shaly silt loam
		7 to 15	Shaly silty clay loam
		15 to 19	Shaly silty clay loam

their estimated physical and chemical properties

Classification—Continued		Percent passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
					In./hr.	*In./in.*	*pH*	
ML or CL	A-4	85 to 100	85 to 100	75 to 85	0.63 to 2.0	0.15	5.6 to 6.0	Low to moderate.
ML or CL	A-6 or A-7	85 to 100	85 to 100	75 to 85	0.63 to 2.0	0.12	5.1 to 5.5	Low to moderate.
MH or CH	A-7	85 to 100	85 to 100	75 to 85	0.63 to 2.0	0.10	5.1 to 5.5	Moderate to high.
MH or CH	A-7	85 to 100	85 to 100	75 to 85	0.2 to 0.63	0.10	5.1 to 5.5	High.
MH or CH	A-7	55 to 100	55 to 95	50 to 85	0.2 to 0.63	0.10	5.1 to 5.5	High.
ML or CL	A-4	80 to 95	75 to 85	60 to 75	2.0 to 6.3	0.14	5.1 to 5.5	Low.
ML or SM	A-4	55 to 90	55 to 85	45 to 75	2.0 to 6.3	0.14	5.1 to 5.5	Low to moderate.
GC or SC	A-6 or A-7	50 to 80	40 to 50	35 to 50	2.0 to 6.3	0.15	4.5 to 5.0	Moderate.
ML or CL	A-4	70 to 95	60 to 80	50 to 70	2.0 to 6.3	0.18	5.6 to 6.0	Low to moderate.
MH or CH	A-7	75 to 95	60 to 80	50 to 65	0.2 to 0.63	0.16	5.1 to 5.5	High.
MH or CH	A-7	75 to 95	60 to 80	50 to 65	0.2 to 0.63	0.16	5.6 to 6.0	High.
MH or CH	A-7	70 to 90	60 to 75	50 to 65	0.2 to 0.63	0.15	6.1 to 6.5	High.
ML	A-4	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.6 to 6.0	Low to moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.1 to 5.5	Moderate.
CL	A-6	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.1 to 5.5	Moderate.
CL	A-6	85 to 100	80 to 100	65 to 100	0.2 to 0.63	0.19 to 0.21	4.5 to 5.0	Moderate.
CL	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.1 to 5.5	Moderate to high.
ML or CL	A-4 or A-6	85 to 100	80 to 100	50 to 80	0.63 to 2.0	0.14 to 0.18	5.6 to 6.0	Low to moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	50 to 80	0.63 to 2.0	0.14 to 0.18	5.1 to 5.5	Low to moderate.
CL or CH	A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.15 to 0.18	4.5 to 5.0	High.
CL or CH	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	4.5 to 5.0	Moderate to high.
ML or CL	A-4	70 to 90	70 to 90	50 to 75	2.0 to 6.3	0.14 to 0.16	5.1 to 6.5	Low to moderate.
CL	A-4	70 to 90	65 to 85	60 to 75	2.0 to 6.3	0.12 to 0.15	4.5 to 5.0	Low to moderate.
SC or GC	A-7 or A-2	50 to 65	30 to 50	30 to 50	2.0 to 6.3	0.12 to 0.15	5.1 to 5.5	Moderate to high.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.6 to 6.0	Low to moderate.
CL	A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.1 to 5.5	Moderate to high.
CL	A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.1 to 5.5	Moderate to high.
CL or CH	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.1 to 5.5	Moderate to high.
ML or CL	A-4	85 to 100	85 to 100	75 to 85	2.0 to 6.3	0.15 to 0.18	6.6 to 7.3	Low to moderate.
ML or CL	A-4 or A-6	75 to 100	85 to 100	75 to 85	2.0 to 6.3	0.14 to 0.16	6.1 to 6.5	Low to moderate.
MH, CH, or SC.	A-7	50 to 75	50 to 70	35 to 60	2.0 to 6.3	0.12 to 0.15	5.6 to 6.0	Moderate to high.
MH, CH, or SC.	A-6 or A-7	50 to 75	50 to 70	35 to 60	0.63 to 2.0	0.14 to 0.16	5.1 to 5.5	Moderate to high.
MH, CH, or SC.	A-7	50 to 75	50 to 70	35 to 60	0.63 to 2.0	0.10 to 0.14	5.1 to 5.5	High.
ML or CL	A-4	85 to 90	80 to 85	70 to 85	0.63 to 2.0	0.16 to 0.20	6.6 to 7.3	Low to moderate.
CL	A-6	85 to 95	75 to 90	65 to 80	0.63 to 2.0	0.14 to 0.16	6.6 to 7.3	Moderate.
ML or GC	A-4 or A-6	60 to 75	50 to 65	40 to 60	0.63 to 2.0	0.13 to 0.15	6.6 to 7.3	Moderate.

TABLE 4.—*Brief descriptions of the soils and*

Soil series and map symbols	Brief description	Depth from surface	Classification: USDA texture
		In.	
Dewey (DeB, DeC2, DeD2)	Well-drained upland soils that occur throughout the county. Depth to bedrock more than 4 feet. Depth to seasonal high water table more than 3 feet. No flood hazard.	0 to 12	Silt loam
		12 to 21	Silty clay loam
		21 to 38	Plastic, slightly cherty silty clay.
		38 to 44	Plastic, slightly cherty silty clay.
Dickson (DkA, DkB, DkB2, DkC2)	Moderately well drained upland soils that occur extensively throughout the county. Fragipan at a depth of 20 to 30 inches. Pan is about 4 to 18 inches thick. Depth to bedrock 4 to more than 6 feet. Depth to seasonal high water table 3 to 5 feet. No flood hazard.	0 to 12	Silt loam
		12 to 23	Silty clay loam
		23 to 34	Silt loam
		34 to 40	Silty clay loam
Elk (EkB)	Well-drained soils on gently sloping terraces along the major streams of the county. Depth to bedrock more than 5 feet. Depth to seasonal high water table more than 4 feet. Infrequent flooding.	0 to 9	Silt loam
		9 to 14	Silt loam
		14 to 32	Silty clay loam
		32 to 38	Silty clay loam
		38 to 52	Sandy loam
Gullied land (Gu)	Severely eroded areas. All properties variable.		
Humphreys (HcB, HcC, HcC2)	Well-drained soils on stream terraces and foot slopes throughout the county. Stratified beds of gravel and chert below a depth of 3 to 5 feet. Depth to bedrock 5 to 12 feet. Depth to seasonal high water table more than 4 feet. Infrequent flooding.	0 to 8	Cherty silt loam
		8 to 14	Cherty silt loam
		14 to 38	Cherty silt loam
Huntington (Hg)	Well-drained alluvial soils on bottom lands. Depth to bedrock 4 to 8 feet. Depth to seasonal high water table 0 to 3 feet. Subject to flooding.	0 to 48	Gravelly silt loam
Huntington (Hu)	Well-drained alluvial soils on bottom lands. Depth to bedrock 4 to 10 feet. Depth to seasonal high water table 0 to 3 feet. Subject to flooding.	0 to 22	Silt loam
		22 to 52	Silt loam
Landisburg (LaC2)	Moderately well drained soils on foot slopes in the central and southern parts of the county. Fragipan at a depth of 24 to 36 inches. Pan is 8 to 20 inches thick. Stratified beds of cherty gravel, silt, and clay at a depth of 3 to 4 feet. Depth to bedrock 4 to 10 feet. Depth to seasonal high water table 1 foot to 2 feet. Infrequent flooding.	0 to 8	Cherty silt loam
		8 to 13	Cherty silt loam or silty clay loam.
		13 to 22	Cherty silty clay loam
		22 to 36	Cherty silt loam
Landisburg (LdB, LdC2)	Moderately well drained soils on foot slopes in the central and southern parts of the county. Fragipan at depth of 24 to 48 inches. Pan is 8 to 30 inches thick. Depth to bedrock 4 to 10 feet. Depth to seasonal high water table 1 foot to 2 feet. Infrequent flooding.	0 to 13	Silt loam
		13 to 24	Silt loam
		24 to 50	Silty clay loam
		50 to 52	Silt loam
Lindside (Ls)	Moderately well drained soils on first bottoms; widespread but of small total acreage. Depth to bedrock 4 to 10 feet. Depth to seasonal high water table 1½ to 3 feet. Subject to flooding.	0 to 10	Silt loam
		10 to 18	Silt loam
		18 to 30	Silt loam
		30 to 46	Silt loam
Melvin (Me)	Poorly drained soils in depressions on bottom lands in the northwestern part of the county. Depth to bedrock 4 to 10 feet. Depth to seasonal high water table 0 to 1 foot. Subject to flooding.	0 to 8	Silt loam
		8 to 16	Silt loam
		16 to 50	Silt loam

their estimated physical and chemical properties—Continued

Classification—Continued		Percent passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
					In./hr.	*In./in.*	*pH*	
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	5. 1 to 6. 0	Low to moderate.
MH or CH	A–7	85 to 100	80 to 100	80 to 100	0. 2 to 0. 63	0. 19 to 0. 21	5. 1 to 5. 5	Moderate to high.
MH or CH	A–7	85 to 100	80 to 100	80 to 100	0. 2 to 0. 63	0. 15 to 0. 18	4. 5 to 5. 0	High.
MH or CH	A–7	85 to 100	80 to 100	80 to 100	0. 2 to 0. 63	0. 15 to 0. 18	4. 5 to 5. 0	High.
ML	A–4	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	5. 1 to 5. 5	Low.
CL	A–6	85 to 100	80 to 100	80 to 100	0. 63 to 2. 0	0. 19 to 0. 21	4. 5 to 5. 0	Moderate.
ML or CL	A–6	85 to 100	80 to 100	65 to 100	0. 2 to 0. 63	0. 18 to 0. 23	5. 1 to 5. 5	Moderate.
CL	A–6 or A–7	85 to 100	80 to 100	80 to 100	0. 2 to 0. 63	0. 19 to 0. 21	5. 1 to 5. 5	Moderate to high.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	5. 6 to 6. 0	Low to moderate.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	5. 1 to 5. 5	Low to moderate.
CL	A–6 or A–7	85 to 100	80 to 100	80 to 100	0. 2 to 0. 63	0. 19 to 0. 21	4. 5 to 5. 0	Moderate to high.
CL	A–6 or A–7	85 to 100	80 to 100	80 to 100	0. 2 to 0. 63	0. 19 to 0. 21	4. 5 to 5. 0	Moderate to high.
SM or SC	A–2 or A–4	85 to 100	80 to 100	25 to 45	2. 0 to 6. 3	0. 10 to 0. 14	<4. 5	Low.
ML or CL	A–4	70 to 90	60 to 80	50 to 75	2. 0 to 6. 3	0. 16 to 0. 20	6. 1 to 6. 5	Low to moderate.
ML or GM	A–4	65 to 85	55 to 75	45 to 70	2. 0 to 6. 3	0. 16 to 0. 18	5. 1 to 5. 5	Low.
ML or GM	A–4	65 to 85	55 to 75	45 to 70	2. 0 to 6. 3	0. 16 to 0. 18	5. 1 to 5. 5	Low.
ML or SM	A–2 or A–4	70 to 85	65 to 75	30 to 60	2. 0 to 6. 3	0. 15 to 0. 18	6. 1 to 6. 5	Low.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	6. 1 to 6. 5	Low to moderate.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	5. 6 to 6. 0	Low to moderate.
ML or GM	A–4	65 to 85	55 to 75	45 to 70	0. 63 to 2. 0	0. 15 to 0. 20	5. 6 to 6. 0	Low.
ML	A–6 or A–4	70 to 90	60 to 80	50 to 75	0. 63 to 2. 0	0. 14 to 0. 17	5. 1 to 5. 5	Low to moderate.
ML or CL	A–6 or A–4	70 to 90	60 to 80	50 to 75	0. 63 to 2. 0	0. 13 to 0. 16	4. 5 to 5. 0	Moderate.
ML or CL	A–6 or A–4	70 to 90	60 to 80	50 to 75	<0. 2	0. 15 to 0. 17	4. 5 to 5. 0	Low.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 22	5. 1 to 5. 5	Low to moderate.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 22	5. 1 to 5. 5	Low to moderate.
CL	A–6	85 to 100	80 to 100	80 to 100	<0. 2	0. 19	5. 1 to 5. 5	Moderate.
ML or CL	A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 22	5. 1 to 5. 5	Moderate.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	6. 1 to 6. 5	Low to moderate.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	6. 1 to 6. 5	Low to moderate.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	5. 6 to 6. 0	Low to moderate.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	5. 6 to 6. 0	Low to moderate.
ML	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	6. 1 to 6. 5	Low to moderate.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 63 to 2. 0	0. 18 to 0. 23	6. 1 to 6. 5	Low to moderate.
ML or CL	A–4 or A–6	85 to 100	80 to 100	65 to 100	0. 2 to 0. 63	0. 18 to 0. 23	6. 1 to 6. 5	Low to moderate.

TABLE 4.—*Brief descriptions of the soils and*

Soil series and map symbols	Brief description	Depth from surface	Classification: USDA texture
		In.	
Mountview (MoB, MoC2)	Well-drained upland soils that occur extensively in the county. Depth to bedrock, 4 to 6 feet. Depth to seasonal high water table more than 3 feet. No flood hazard.	0 to 12	Silt loam
		12 to 30	Silt loam
		30 to 40	Silty clay loam
		40 to 46	Clay
Muse (MuC)	Well-drained soils on foot slopes along East Fork Little Barren River. Depth to bedrock, 4 to 8 feet. Depth to seasonal high water table more than 3 feet. No flood hazard.	0 to 7	Silt loam
		7 to 12	Silty clay loam
		12 to 25	Silty clay
		25 to 37	Silty clay
		37 to 40	Clay or silty clay loam
Newark (Nk)	Somewhat poorly drained alluvial soils that occur extensively on bottom lands in the county. Depth to bedrock 4 to 10 feet. Depth to seasonal high water table ½ to 1 foot. Subject to flooding.	0 to 12	Silt loam
		12 to 26	Silt loam
		26 to 48	Silt loam
Pembroke (PmB, PmC2)	Well-drained soils of karst areas and sloping uplands; widely distributed over the upland areas of the county. Depth to bedrock, more than 4 feet. Depth to seasonal high water table more than 4 feet. No flood hazard.	0 to 7	Silt loam
		7 to 16	Silt loam
		16 to 29	Silty clay loam
		29 to 51	Silty clay loam
Renox (RaC)	Well-drained soils on foot slopes, low benches, and fans near the southern edge of the county. Depth to bedrock 4 to 8 feet. Depth to seasonal high water table more than 3 feet. No flood hazard.	0 to 15	Silt loam
		15 to 21	Shaly silt loam or shaly silty clay loam.
		21 to 36	Shaly silty clay loam
		36 to 40	Shaly silty clay loam
Robertsville (Rb)	Poorly drained soils on stream terraces; widely distributed in county but small in total acreage. Fragipan at depth of 12 to 20 inches. Pan is 15 to 30 inches thick. Depth to bedrock 5 to 10 feet. Depth to seasonal high water table 0 to 1 foot. Subject to flooding.	0 to 5	Silt loam
		5 to 14	Silt loam
		14 to 40	Silty clay loam
		40 to 45	Plastic silty clay loam
Robinsonville (Rf)	Well-drained alluvial soils on bottom lands. Depth to bedrock 4 to 10 feet. Depth to seasonal high water table more than 3 feet. Subject to flooding.	0 to 20	Fine sandy loam
		20 to 48+	Fine sandy loam or loamy sand.
Rock land (Rk)	Surface is 25 to 90 percent rock outcrops.		
Sango (SaA, SaB)	Moderately well drained, nearly level soils; widely distributed but moderate in total acreage. Fragipan at depth of 20 to 30 inches. Pan is 10 to 20 inches thick. Depth to bedrock 4 to 10 feet. Depth to seasonal high water table 1½ to 2 feet. No flood hazard.	0 to 7	Silt loam
		7 to 20	Silt loam
		20 to 30	Silt loam
		30 to 43	Silt loam or silty clay loam
Taft (Ta)	Somewhat poorly drained soils on stream terraces; widely distributed along most streams but small in total acreage. Fragipan at depth of 14 to 20 inches. Pan is 10 to 30 inches thick. Depth to bedrock 5 to 10 feet. Depth to seasonal high water table 1 foot to 2 feet. Subject to flooding.	0 to 9	Silt loam
		9 to 16	Silt loam
		16 to 28	Silt loam
		28 to 37	Silt loam
Talbott (TbC, TcC2)	Well-drained upland soils. Depth to bedrock 2 to 5 feet. Depth to seasonal high water table, more than 3 feet. No flood hazard.	0 to 7	Silt loam
		7 to 13	Silty clay loam
		13 to 37	Plastic clay
		37 to 46	Plastic clay

their estimated physical and chemical properties—Continued

Classification—Continued		Percent passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
					In./hr.	*In./in.*	*pH*	
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.1 to 5.5	Low to moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.1 to 5.5	Low to moderate.
CL	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.1 to 5.5	Moderate to high.
CH or MH	A-7	85 to 100	80 to 100	70 to 100	0.2 to 0.63	0.15 to 0.18	5.1 to 5.5	High.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.1 to 5.5	Low to moderate.
CL, MH, or CH	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.1 to 5.5	Moderate.
CL, MH, or CH	A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.15 to 0.18	5.1 to 5.5	Moderate to high.
CL, MH, or CH	A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.15 to 0.18	5.1 to 5.5	Moderate to high.
CL, MH, or CH	A-7	85 to 100	80 to 100	70 to 100	0.2 to 0.63	0.15 to 0.18	5.1 to 5.5	Moderate to high.
CL or ML	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.6 to 6.5	Low to moderate.
CL or ML	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	6.1 to 6.5	Low to moderate.
CL or ML	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	6.1 to 6.5	Low to moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.6 to 6.0	Low to moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.6 to 6.0	Low to moderate.
CL	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.6 to 6.0	Moderate to high.
CL	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.6 to 6.0	Moderate to high.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.22	5.6 to 6.0	Low to moderate.
ML or CL	A-6 or A-7	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18	5.1 to 5.5	Moderate to high.
ML or CL	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.63 to 2.0	0.18	5.1 to 5.5	Moderate to high.
ML	A-6	85 to 100	80 to 100	50 to 80	0.63 to 2.0	0.18	5.1 to 5.5	Moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.1 to 5.5	Low to moderate.
ML or CL	A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	4.5 to 5.0	Moderate.
CL or CH	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	4.5 to 5.0	Moderate to high.
CL or CH	A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	4.5 to 5.0	High.
SM or ML	A-2 or A-4	85 to 100	80 to 100	25 to 60	2.0 to 6.3	0.13 to 0.15	6.1 to 6.5	Low.
SM or ML	A-2 or A-4	85 to 100	80 to 100	25 to 60	>6.3	0.08 to 0.13	5.6 to 6.0	Low.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.6 to 6.0	Low to moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.1 to 5.5	Low to moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.2 to 0.63	0.18 to 0.23	5.1 to 5.5	Low to moderate.
CL	A-6 or A-7	85 to 100	80 to 100	65 to 100	0.2 to 0.63	0.19 to 0.21	5.1 to 5.5	Moderate to high.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.6 to 6.0	Low to moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	5.1 to 5.5	Low to moderate.
ML or CL	A-6	85 to 100	80 to 100	65 to 100	0.2 to 0.63	0.18 to 0.23	5.1 to 5.5	Moderate.
ML or CL	A-6	85 to 100	80 to 100	65 to 100	0.2 to 0.63	0.18 to 0.23	4.5 to 5.0	Moderate.
ML or CL	A-4 or A-6	85 to 100	80 to 100	65 to 100	0.63 to 2.0	0.18 to 0.23	6.1 to 6.5	Low to moderate.
CL or CH	A-6 or A-7	85 to 100	80 to 100	80 to 100	0.2 to 0.63	0.19 to 0.21	5.6 to 6.0	Moderate to high.
CH	A-7	85 to 100	80 to 100	70 to 100	<0.2 to 0.63	0.15 to 0.18	5.1 to 5.5	High.
CH	A-7	85 to 100	80 to 100	70 to 100	<0.2	0.15 to 0.18	5.1 to 5.5	High.

TABLE 5.—*Interpretations of*

Soil series and map symbols	Susceptibility to frost action	Suitability as a source of—		Degree of limitation for use as—	
		Topsoil	Road fill	Locations of low buildings (undisturbed soil) [1]	Disposal areas for domestic septic-tank systems [2]
Baxter (BaB, BaB2, BaC, BaC2, BaD, BaD2, BaE, BaE2, BcC3, BcD3, BcE3, BeC2, BeD2, BeE2, BfD3)	Moderate to high.	Poor	Fair to poor	Moderate. Moderate shrink-swell potential in substratum; may be highly susceptible to frost action.	Severe. Shallow to bedrock in some areas; moderately slow permeability.
Bodine (BoD, BoE)	High	Poor	Fair to good	Severe. Steep slopes; moderately deep to bedrock.	Severe. Moderately deep to bedrock; steep slopes.
Caneyville (CaE, CaE3, CaF)	Moderate to high.	Fair	Poor; limited quantity.	Severe. Steep slopes; moderately deep to bedrock.	Severe. Moderately deep to bedrock; steep slopes.
Captina (CbA, CbB)	Moderate to high.	Fair to good.	Fair	Moderate. Seasonal high water table; possible flooding in some areas.	Severe. Seasonal high water table; fragipan; possible flooding in some areas.
Christian (CcD3, CdB, CdC, CdC2, CdD2, CeD)	Moderate	Fair	Fair to poor	Moderate. Some areas are moderately steep and rocky.	Severe. Slow permeability; rocky soils.
Clarksville (CkB, CkC, CkC2, CkD2, CkE2)	High	Poor	Fair	Moderate. Moderately deep or deep to chert beds; steep slopes.	Moderate. Moderately deep or deep to chert beds; shallow to bedrock in some places. Possibility of contamination of ground water.
Crider (CrB, CrB2, CrC2)	Moderate to high.	Good	Fair to poor	Moderate. Moderate to high shrink-swell potential; moderately to highly susceptible to frost action.	Severe. Moderately slow permeability; possibility of contamination of ground water.
Cumberland (CuB, CuB2, CuC2, CuD2, CvD3)	Moderate to high.	Poor	Fair to poor	Slight; moderate where slope is between 8 and 20 percent.	Slight. Some moderately steep slopes.
Dandridge (DaD, DaF, DbD3, DbF3, DcB, DcC)	Moderate to high.	Poor	Good to poor	Severe. Shallow to bedrock; some steep slopes.	Severe. Shallow to bedrock; some steep slopes.
Dewey (DeB, DeC2, DeD2)	Moderate to high.	Fair	Poor	Slight to moderate. Moderate shrink-swell potential in subsoil; some moderately steep slopes.	Severe. Slow permeability; possibility of contamination of ground water through sinks and caverns.
Dickson (DkA, DkB, DkB2, DkC2)	Moderate to high.	Fair	Fair	Moderate. Moderate shrink-swell potential; moderately to highly susceptible to frost action.	Severe. Slow permeability.

See footnotes at end of table.

engineering properties

Soil features adversely affecting suitability for engineering practices						
Highway location	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
Shallow to bedrock in some places.	Excessive seepage through cherty substratum and cavernous bedrock.	Amount of material limited in some places; moderate to high shrink-swell potential.	Not needed	Moderately slow permeability; some steep slopes.	Some steep slopes.	Cherty; may be difficult to establish vegetation.
Steep slopes; poor compaction.	Excessive seepage through chert bed.	Hazard of piping	Not needed	Steep slopes	Steep slopes	Steep slopes.
Steep slopes; moderately deep to bedrock.	Cavernous bedrock.	Amount of material limited.	Not needed	Steep slopes; moderately deep soil.	Rocky; steep slopes.	Rocky; steep slopes.
Seasonal high water table; possible flooding in some areas.	None	None	Fragipan	Moderately slow permeability; possible flooding.	None	Side-slope seepage; fragipan.
Some steep slopes; some rocky areas; shallow to bedrock in some places.	Possible seepage.	Amount of material limited in rocky areas.	Not needed	Moderately slow permeability; some rocky areas.	Some rocky areas.	Some rocky areas.
Shallow to chert beds.	Excessive seepage through chert beds.	Moderately deep or deep to chert beds.	Not needed	Moderately rapid permeability; some steep slopes.	Moderately deep to chert beds.	Excessive drainage into chert beds.
Bedrock may be cavernous.	Bedrock cavernous in some places.	None	Not needed	Moderately slow permeability.	Some moderately steep slopes.	Some moderately steep slopes.
Some moderately steep slopes.	May be some seepage.	None	Not needed	Some steep slopes	Some steep slopes.	Some steep slopes.
Shallow to bedrock; some steep slopes.	Some steep slopes.	Amount of material limited.	Not needed	Shallow to bedrock.	Some steep slopes; shallow to bedrock.	Shallow to bed rock; some steep slopes.
Some moderately steep slopes.	Bedrock cavernous in some places.	None	Not needed	Some steep slopes; moderately slow permeability.	Some steep slopes.	Some steep slopes.
Some moderately steep slopes.	None	None	Fragipan	Moderately slow permeability.	None	None.

TABLE 5.—*Interpretations of*

Soil series and map symbols	Susceptibility to frost action	Suitability as a source of—		Degree of limitation for use as—	
		Topsoil	Road fill	Locations of low buildings (undisturbed soil) [1]	Disposal areas for domestic septic-tank systems [2]
Elk (EkB)	Moderate to high.	Good	Fair	Moderate to severe. Occasional flooding.	Severe. Moderately slow permeability; occasional flooding.
Gullied land (Gu)	Variable	Variable	Variable	Variable	Variable
Humphreys (HcB, HcC, HcC2)	Slight to moderate.	Poor	Good to poor	Moderate to severe. Infrequent flooding.	Moderate. Severe when flooded. Possibility of contamination of ground water.
Huntington gravelly silt loam (Hg)	High	Poor	Good to poor	Severe. Subject to flooding.	Severe. Subject to flooding.
Huntington silt loam (Hu)	High	Good	Good to fair	Severe. Subject to flooding.	Severe. Subject to flooding.
Landisburg (LaC2, LdB, LdC2)	Moderate to high.	Fair	Good to poor	Moderate. Seasonal high water table; infrequent flooding.	Severe. Slow permeability; infrequent flooding.
Lindside (Ls)	Moderate to high.	Good	Good to fair	Severe. Subject to flooding; seasonal high water table.	Severe. Subject to flooding; seasonal high water table.
Melvin (Me)	High	Good	Fair to poor	Severe. Subject to flooding; seasonal high water table.	Severe. Subject to flooding; seasonal high water table.
Mountview (MoB, MoC2)	Moderate to high.	Good	Fair	Slight	Severe. Moderately slow permeability.
Muse (MuC)	Moderate	Fair to poor.	Fair to poor	Slight	Severe. Slow permeability
Newark (Nk)	High	Good	Fair to poor	Severe. Subject to flooding; seasonal high water table.	Severe. Subject to flooding; seasonal high water table.
Pembroke (PmB, PmC2)	Moderate	Good to fair.	Fair to poor	Slight	Severe. Slow permeability; possibility of contamination of ground water.
Renox (RaC)	Moderate	Good to fair.	Fair to poor	Moderate	Moderate
Robertsville (Rb)	Moderate to high.	Good to fair.	Fair to poor	Severe. Subject to flooding; seasonal high water table.	Severe. Subject to flooding; seasonal high water table; slow permeability.
Rock land (Rk)	Variable	Variable	Variable	Variable	Variable

See footnotes at end of table.

engineering properties—Continued

Soil features adversely affecting suitability for engineering practices						
Highway location	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
Sandy loam at depth of about 3½ to 4 feet.	Seepage in substratum; infrequent flooding.	Some hazard of piping.	Not needed	Moderately slow permeability.	None	None.
Variable	Variable	Variable	Variable	Variable	Variable	Variable.
Infrequent flooding.	Excessive seepage.	Hazard of piping	Not needed	Moderately rapid permeability.	None	None.
Subject to flooding.	Excessive seepage.	Hazard of piping	Not needed	Moderately rapid permeability; subject to flooding.	Terraces not needed.	Subject to flooding; gravelly.
Subject to flooding.	Excessive seepage.	Hazard of piping	Not needed	Moderate permeability; subject to flooding.	Terraces not needed.	Subject to flooding.
Seasonal high water table; infrequent flooding.	Excessive seepage.	Hazard of piping	Fragipan; subject to infrequent flooding.	Moderately slow to slow permeability.	None	None.
Subject to flooding; seasonal high water table.	Subject to seepage.	Hazard of piping	Subject to flooding.	Subject to flooding; moderate permeability.	Subject to flooding.	Subject to flooding.
Subject to flooding; seasonal high water table.	Subject to seepage.	Some hazard of piping.	Subject to flooding; seasonal high water table.	Seasonal high water table; moderate permeability.	Subject to flooding.	Subject to flooding.
None	None	None	Not needed	Moderately slow permeability.	None	None.
None	None	None	Not needed	Slow permeability.	None	None.
Subject to flooding; seasonal high water table.	Excessive seepage.	Hazard of piping	Seasonal high water table.	Subject to flooding; seasonal high water table; moderate permeability.	Terraces not needed.	Subject to flooding.
None	Bedrock creviced in some places.	None	Not needed	Moderately slow permeability.	None	None.
Moderate slopes	None	None	Not needed	Moderate permeability; slope.	None	None.
Subject to flooding; seasonal high water table.	None	None	Fragipan	Shallow to fragipan; moderately slow permeability.	Terraces not needed.	Subject to flooding.
Variable	Variable	Variable	Variable	Variable	Variable	Variable.

TABLE 5.—*Interpretations of*

Soil series and map symbols	Susceptibility to frost action	Suitability as a source of—		Degree of limitation for use as—	
		Topsoil	Road fill	Locations of low buildings (undisturbed soil) [1]	Disposal areas for domestic septic-tank systems [2]
Robinsonville (Rf)	Slight to high.	Fair to good.	Good to poor.	Severe. Subject to flooding.	Severe. Subject to flooding.
Sango (SaA, SaB)	Moderate to high.	Good	Fair	Moderate. Seasonal high water table.	Severe. Seasonal high water table; slow permeability.
Taft (Ta)	Moderate to high.	Good	Fair	Severe. Subject to flooding; seasonal high water table.	Severe. Seasonal high water table; slow permeability; subject to flooding.
Talbott (BeC2, BeD2, BeE2, BfD3, TbC, TcC2)	High	Poor	Poor to fair	Moderate. Moderately deep to bedrock in some places; plastic subsoil.	Severe. Slow permeability; shallow to bedrock in some places.
Westmoreland (DaD, DaF, DbD3, DbF3, DcB, DcC)	Moderate to high.	Poor	Good to poor.	Severe. Moderately deep soil; some steep slopes.	Severe. Moderately deep to bedrock.

[1] Limitation is severe where slope is more than 20 percent and in areas subject to flooding.

Topography

Topography influences soil formation through its effect on moisture relations, temperature, erosion, and plant cover. For example, the moderately steep and steep areas of Dandridge and Westmoreland soils have weakly developed horizons because runoff is more rapid on steeper slopes and, in places, erosion removes the soil material as fast as it forms. The Clarksville soils occur in areas where the slope ranges from 2 to 30 percent. They are generally thinner and less well developed in areas where the slope is 30 percent than in areas where the slope is 2 percent. Where the slope is less than 20 percent, the soils are normally deep and their horizons are strongly developed because geologic erosion has been less active and the soil-forming processes have progressed more rapidly. The Cumberland, Christian, Dewey, and Landisburg soils are examples of soils with well-expressed horizons.

In nearly level and gently sloping areas, runoff is slower and more water percolates down through the soil. Erosion has been slow because runoff is slow and surface materials from adjacent areas tend to accumulate. The Melvin, Lindside, and Newark soils have a seasonal high water table because they occur in low areas where water tends to collect. The Renox and Muse soils formed in materials that washed or rolled from higher elevations.

The direction of the slope causes minor variations in soil development. Soils on north-facing slopes, without direct exposure to sunlight, have a lower temperature, a slower moisture-evaporation rate, and a more favorable environment for plants than soils on the warmer, south-facing slopes.

Time

The influence of the other factors of soil formation is largely determined by time. In Metcalfe County all of the parent materials except those of the alluvial soils have been in place a long time, during which the active factors of soil formation have exerted their influence. The soils range from young, or immature, to old, or mature. Most of the soils are considered mature.

The Baxter and Talbott soils formed over a long period of time. They have well-developed profiles and characteristics. The Dandridge soils are old with respect to time, but they lack well-defined genetic horizons because accelerated erosion has removed soil material about as fast as it has accumulated. The Huntington and Robinsonville soils are young and weakly developed. They formed in recent alluvial deposits and are continually being added to or altered by floodwater.

Classification of the Soils

The system of soil classification used in the United States has six categories (*10*). Beginning with the most inclusive, the six categories are the order, the suborder, the great soil group, the family, the series, and the type. Only four of the categories—order, great soil group, series, and type—have been widely used.

In the highest category of the classification scheme are the zonal, intrazonal, and azonal orders. All three orders are represented in Metcalfe County. Eight of the great soil groups are represented: Reddish-Brown Lateritic soils, Red-Yellow Podzolic soils, Gray-Brown Podzolic

engineering properties—Continued

Soil features adversely affecting suitability for engineering practices						
Highway location	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
Subject to flooding.	Excessive seepage.	Hazard of piping	Not needed	Rapid permeability.	Highly erodible	Subject to flooding.
Seasonal high water table.	None	None	Fragipan	Moderately slow permeability.	None	Seasonal high water table.
Subject to flooding; seasonal high water table.	None	None	Fragipan	Shallow to fragipan; moderately slow permeability.	Terraces not needed.	Side slope seepage.
Some steep slopes	Bedrock cavernous in some places.	None	Not needed	Slow permeability.	Some steep slopes.	None.
Shallow to bedrock.	Moderately deep to bedrock.	Amount of material limited.	Not needed	Moderately deep to bedrock; some steep slopes.	Moderately deep to bedrock; some steep slopes.	Moderately deep to bedrock.

[2] Limitation is severe where slope is more than 15 percent.

soils, Sols Bruns Acides, Low-Humic Gley soils, Planosols, Alluvial soils, and Lithosols. The relation between the order, the great soil group, and the series is shown in table 6.

A classification system now being put into use defines classes in terms of observable or measurable properties of soils. The system is designed to accommodate all soils. It has six categories, like the earlier system, but the categories are slightly different. Beginning with the most inclusive, they are the order, the suborder, the great group, the subgroup, the family, and the series.[7] The soil series are tentatively classified by subgroup and great group into the new system in table 6.

In the following pages the classification of the soils is discussed in terms of the system used before 1964.

Zonal order

The zonal order consists of soils that have evident, genetically related horizons that reflect the predominant influence of climate and living matter in their development (*11*). The parent materials have been in place a long time, and the influence of topography has been minor. As a result, these soils have many properties in common, although they are derived from various kinds of parent material. In Metcalfe County the great soil groups representing the zonal order are Reddish-Brown Lateritic soils, Red-Yellow Podzolic soils, Gray-Brown Podzolic soils, and Sols Bruns Acides.

[7] UNITED STATES DEPARTMENT OF AGRICULTURE. SOIL SURVEY STAFF, SCS. SOIL CLASSIFICATION, A COMPREHENSIVE SYSTEM, 7TH APPROXIMATION. 1960. [Amended June 1964.]

Reddish-Brown Lateritic soils.—This group consists of well-drained, acid soils that formed under forest vegetation in a humid, warm-temperate climate. These soils have a dark reddish-brown, granular A horizon, a dark-red, clayey B horizon, and dark-red, mottled parent material. They lack the distinct A2 horizon that is characteristic of Red-Yellow Podzolic soils. Their B2 horizon is a darker red and has a moderate or strong, subangular blocky structure. Generally, cultivation has mixed the uppermost few inches of the A horizon.

The Cumberland soils are the only Reddish-Brown Lateritic soils in this county.

Red-Yellow Podzolic soils.—Red-Yellow Podzolic soils have a thin, organic (O) horizon over an organic-mineral (A1) horizon overlying a light yellowish-brown to brown, leached A2 horizon, which, in turn, is underlain by an illuvial, yellowish-brown, yellowish-red, or red, more clayey Bt horizon. Mottles of lighter colors are common in the lower horizons. These soils developed in a warm-temperate, humid climate, mainly under deciduous forest.

The central concept of the Red-Yellow Podzolic great soil group is represented in this county by the Baxter, Caneyville, Christian, Clarksville, Crider, Dewey, Humphreys, Mountview, Muse, Pembroke, and Talbott soils. In addition, Red-Yellow Podzolic soils that have a firm, compact fragipan below a depth of 20 to 36 inches occur in this county. These are the Captina, Dickson, Landisburg, and Sango soils.

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TABLE 6.—*Classification of the soils by higher categories and significant characteristics of each series*

Order, great soil group, and soil series	Brief description of profile	Position on landscape	Drainage	Slope range	Parent material	Degree of profile development	Classification according to the Comprehensive System (7th Approximation)
ZONAL ORDER							
Reddish-Brown Lateritic group:							*Subgroup and great group*
Cumberland	An Ap horizon of dark-brown cherty silt loam over a B2 horizon of dark-red or dusky-red cherty silty clay.	Uplands	Well drained	*Percent* 2 to 20	Residuum from cherty limestone.	Strong	Typic Rhodudult.
Red-Yellow Podzolic group:							
Representative—							
Baxter	An A horizon of brown cherty silt loam over a B horizon of reddish-brown to yellowish-red cherty silty clay loam or cherty silty clay over chert beds.	Uplands	Well drained	2 to 30	Residuum from cherty limestone.	Strong	Typic Hapludult.
Caneyville	An Ap horizon of yellowish-brown loam over a B horizon of yellowish-red silty clay or sandy clay over limestone, sandstone, or shale.	Uplands	Well drained	20 to 50	Residuum from limestone, sandstone, and shale.	Moderate or weak.	Typic Hapludalf.[1]
Christian	An A horizon of brown or yellowish-brown loam over a B2 horizon of red or yellowish-red silty clay over red, weathered sandstone.	Uplands	Well drained	2 to 20	Residuum mainly from interbedded limestone and sandstone but partly from shale.	Strong	Typic Hapludult.
Clarksville	Brown or yellowish-brown cherty silt loam over a B2 horizon of yellowish-brown or strong-brown cherty heavy silt loam or cherty silty clay loam over chert beds.	Uplands	Well drained	2 to 30	Residuum from cherty limestone, with some siltstone.	Moderate	Typic Hapludult.
Crider	An Ap horizon of brown or dark grayish-brown silt loam over a B2 horizon of yellowish-red or red silty clay loam over variegated red and yellowish-brown silty clay loam.	Uplands	Well drained	2 to 12	Loess mantle over residuum from limestone.	Moderate	Alfic Hapludult.[1]
Dewey	An Ap horizon of brown silt loam over a B2 horizon of red silty clay over cherty limestone.	Uplands	Well drained	2 to 20	Residuum from limestone.	Strong	Typic Hapludult.

See footnotes at end of table.

TABLE 6.—*Classification of the soils by higher categories and significant characteristics of each series*—Continued

Order, great soil group, and soil series	Brief description of profile	Position on landscape	Drainage	Slope range	Parent material	Degree of profile development	Classification according to the Comprehensive System (7th Approximation)
ZONAL ORDER—Con. Red-Yellow Podzolic group—Con. Representative—Continued				*Percent*			*Subgroup and great group*
Humphreys	An Ap horizon of brown cherty silt loam over a B2 horizon of yellowish-brown cherty heavy silt loam or cherty silty clay loam over stratified alluvium or colluvium.	Terraces	Well drained	2 to 12	Alluvial and colluvial material derived from limestone, sandstone, and shale.	Moderate or weak.	Alfic Hapludult.
Mountview	An Ap horizon of brown silt loam over a B horizon of variegated yellowish-brown or strong-brown heavy silt loam over clay.	Uplands	Well drained	2 to 12	Loess mantle over residuum from limestone.	Moderate	Typic Hapludult.
Muse	An Ap horizon of brown silt loam over a B2 horizon of yellowish-red silty clay over variegated red, yellowish-brown, and light-gray clay.	Foot slopes	Well drained	6 to 12	Colluvium derived chiefly from acid shale.	Moderate	Typic Hapludult.
Pembroke	An Ap horizon of dark reddish-brown silt loam over a B2 horizon of red or dark-red silty clay loam.	Uplands	Well drained	2 to 12	Residuum from limestone with a thin mantle of loess.	Moderate	Humic Hapludult.[1]
Talbott	An Ap horizon of dark yellowish-brown silt loam over a B2 horizon of yellowish-red clay over variegated yellowish-brown and dark-red clay.	Uplands	Well drained	6 to 12	Residuum from argillaceous limestone.	Strong or moderate.	Alfic Hapludult.
With fragipan—Captina	An Ap horizon of brown silt loam over a B2 horizon of yellowish-brown silty clay loam over a fragipan of yellowish-brown, mottled silt loam or silty clay loam.	Terraces	Moderately well drained.	0 to 6	Alluvium derived mainly from limestone but partly from shale and sandstone; influenced by loess in places.	Strong	Typic Fragiudult.
Dickson	An Ap horizon of brown silt loam over a B2 horizon of yellowish-brown silty clay loam over a yellowish-brown, mottled fragipan.	Uplands	Moderately well drained.	0 to 12	Loess mantle over residuum from limestone.	Strong	Typic Fragiudult.

See footnotes at end of table.

TABLE 6.—*Classification of the soils by higher categories and significant characteristics of each series*—Continued

Order, great soil group, and soil series	Brief description of profile	Position on landscape	Drainage	Slope range	Parent material	Degree of profile development	Classification according to the Comprehensive System (7th Approximation)
ZONAL ORDER—Con.							
Red-Yellow Podzolic group—Con.							
With fragipan—Continued							
				Percent			*Subgroup and great group*
Landisburg	An Ap horizon of brown cherty silt loam over yellowish-brown cherty silty clay loam over a fragipan of mottled yellowish-brown, light olive-brown, and light brownish-gray cherty silt loam.	Terraces and foot slopes.	Moderately well drained.	2 to 12	Alluvium and colluvium derived from cherty limestone, shale, and sandstone.	Strong	Aquic Fragiudalf.[1]
Sango	An Ap horizon of pale-brown silt loam over a B2 horizon of light yellowish-brown silt loam over a fragipan of mottled light yellowish-brown, light-gray, light brownish-gray, and strong-brown heavy silt loam or silty clay loam.	Uplands	Moderately well drained.	0 to 6	Residuum from limestone, capped in places with loess.	Strong	Typic Fragiudult.
Gray-Brown Podzolic group:							
Representative—Renox	An Ap horizon of dark-brown silt loam over a B2 horizon of dark yellowish-brown, shaly heavy silt loam over yellowish-brown, gray, and light-brown silty clay loam.	Foot slopes	Well drained	6 to 12	Colluvium or alluvium derived from black and gray shale, sandstone, and cherty limestone.	Weak	Mollic Hapludalf.
Intergrade to Red-Yellow Podzolic group—							
Elk	An Ap horizon of dark-brown silt loam over a B2 horizon of yellowish-brown silty clay loam.	Terraces	Well drained	2 to 6	Alluvium derived chiefly from limestone.	Moderate	Alfic Hapludult.
Westmoreland	An Ap horizon of dark grayish-brown shaly silt loam over a B horizon of yellowish-brown shaly silty clay loam over shaly limestone.	Uplands	Somewhat excessively drained.	6 to 50	Residuum from shaly limestone and calcareous shale.	Weak or moderate.	Alfic Hapludult.

See footnotes at end of table.

TABLE 6.—*Classification of the soils by higher categories and significant characteristics of each series*—Continued

Order, great soil group, and soil series	Brief description of profile	Position on landscape	Drainage	Slope range	Parent material	Degree of profile development	Classification according to the Comprehensive System (7th Approximation)
ZONAL ORDER—Con.				*Percent*			*Subgroup and great group*
Sols Bruns Acides:							
Bodine	An Ap horizon of brown cherty silt loam over a B horizon of yellowish-brown cherty heavy silt loam over brownish-yellow chert beds.	Uplands	Excessively drained.	12 to 35	Residuum from very cherty limestone.	Weak	Typic Dystrochrept.[1]
INTRAZONAL ORDER							
Low-Humic Gley group:							
Melvin	An Ap horizon of dark grayish-brown silt loam over dark-gray, mottled silt loam over gray, mottled silt loam.	Bottom lands.	Poorly drained.	0 to 2	Alluvium derived chiefly from limestone.	Little or none.	Cumulic Haplaquept.
Planosol group:							
Robertsville	An Ap horizon of mottled, grayish-brown silt loam; mottled light-gray, pale-olive, yellowish-brown and brown fragipan.	Terraces	Poorly drained.	0 to 2	Alluvium derived chiefly from limestone.	Strong	Typic Fragiaquult.
Taft	An Ap horizon of brown silt loam; mottled brown, yellowish-brown, and brownish-yellow fragipan.	Terraces	Somewhat poorly drained.	0 to 3	Alluvium derived chiefly from limestone.	Strong	Aquic Fragiudult.
AZONAL ORDER							
Alluvial group:							
Huntington	An Ap horizon of dark-brown silt loam over a C horizon of brown silt loam.	Bottom lands.	Well drained	0 to 3	Alluvium derived chiefly from limestone.	Little or none.	Typic Hapludoll.[1]
Lindside	An Ap horizon of brown silt loam over a C horizon of brown silt loam.	Bottom lands.	Moderately well drained.	0 to 3	Alluvium derived chiefly from limestone.	Little or none.	Typic Udifluvent.
Newark	An Ap horizon of brown silt loam over a mottled brown or grayish-brown C horizon.	Bottom lands.	Somewhat poorly drained.	0 to 3	Alluvium derived chiefly from limestone.	Little or none.	Aeric Fluventic Haplquept.
Robinsonville	An Ap horizon of brown fine sandy loam over a C horizon of dark-brown or brown fine sandy loam.	Bottom lands.	Well drained	0 to 3	Alluvium derived from mixed materials.	Little or none.	Typic Udifluvent.

See footnotes at end of table.

TABLE 6.—*Classification of the soils by higher categories and significant characteristics of each series*—Continued

Order, great soil group, and soil series	Brief description of profile	Position on landscape	Drainage	Slope range	Parent material	Degree of profile development	Classification according to the Comprehensive System (7th Approximation)
AZONAL ORDER—Continued							*Subgroup and great group*
Lithosol group:				*Percent*			
Dandridge	An Ap horizon of very dark grayish-brown shaly silt loam over a B horizon of yellowish-brown shaly silty clay loam over shaly limestone.	Uplands	Somewhat excessively drained.	6 to 50	Residuum from shaly limestone and calcareous shale.	Weak	Lithic Dystric Eutrochrept

[1] Placement tentative and subject to change.

Gray-Brown Podzolic soils.—This group of soils generally has a thin, organic (O) horizon and a thin, dark, mineral (A1) horizon overlying a grayish-brown A2 horizon that, in turn, is underlain by an illuviated Bt horizon in which clay has accumulated. The B horizon has blocky structure. It is richer in clay and somewhat redder and brighter in color than the horizons above. These soils developed under deciduous forest in a warm-temperate, humid climate.

In this county the Renox series represents the central concept of this great soil group. The Elk and Westmoreland series are Gray-Brown Podzolic soils intergrading to Red-Yellow Podzolic soils.

Sols Bruns Acides.—This great soil group is characterized by soils having a B horizon with a slight formation of silicate clays and with segregation, but no appreciable eluviation and illuviation, of oxides or clays. They formed mainly in moderately acid parent material (*9*). The Bodine soils are the only Sols Bruns Acides in this county.

Intrazonal order

The intrazonal order consists of soils that have evident, genetically related horizons that reflect the dominant influence of time, topography, or parent material over the effects of climate and vegetation (*11*). In Metcalfe County the great soil groups representing the intrazonal order are Low-Humic Gley soils and Planosols.

Low-Humic Gley soils.—These soils are weakly developed. They are poorly drained and are characterized by a very thin A horizon and a gray subsoil with contrasting mottles. They lack the thick, dark surface horizon of the Humic Gley soils; they also lack the fragipan of the Planosols. The Melvin soils are the only Low-Humic Gley soils in this county.

Planosols.—These soils are poorly drained or somewhat poorly drained. They developed in depressions or on flat topography. They have a thin, leached A horizon and a pale, mottled B horizon underlain by a silty, very firm, compact fragipan.

The Planosols are represented in this county by the Robertsville and Taft series.

Azonal order

The azonal order consists of soils that lack distinct, genetically related horizons because of youth, resistant parent material, steep topography, or a combination of all three. In areas where the parent material has been in place only a short time, the soils have weakly defined or no genetic horizons. In Metcalfe County the great soil groups representing the azonal order are Alluvial soils and Lithosols.

Alluvial soils.—Alluvial soils have little or no horizon development because of youth. The original soil material has been changed only slightly or not at all by soil-forming processes. The soils are well drained or moderately well drained. The Alluvial great soil group is represented in this county by the Huntington, Lindside, Newark, and Robinsonville series.

Lithosols.—Lithosols have an incomplete solum or no clearly expressed soil morphology. They consist of a relatively fresh and imperfectly weathered mass of hard rock or rock fragments and are largely confined to steep slopes. This great soil group is represented in this county by the Dandridge series.

Morphology of the Soils

This section discusses each soil series represented in this county and gives a detailed description of a profile that is typical of each. The colors described are for the soils when moist. Color values are normally one or two units higher when the soils are dry.

BAXTER SERIES

The Baxter series consists of well-drained, gently sloping to moderately steep Red-Yellow Podzolic soils that developed in residuum weathered from cherty limestone. In places the soils have karst topography.

Baxter soils are extensive and are common in most parts of the county. They occur with Bodine, Dickson, and

Cumberland soils. They generally occupy steeper slopes than Dewey soils, have more angular chert throughout the solum, and are less red in the B horizon. They are redder than Crider soils and are finer textured in the lower part of the profile. Their parent material lacked the loess, or loesslike, component that is characteristic of Crider soils. Baxter soils differ from Dickson soils in having more chert, a browner A horizon, and a redder B horizon, and in lacking a fragipan. They are coarser textured than Cumberland soils and have a lighter colored, less red A horizon.

Profile of Baxter cherty silt loam, 6 to 12 percent slopes, in a cultivated area along State Highway 1413, about 2 miles north of Cave Ridge:

Ap—0 to 7 inches, brown (10YR 4/3) cherty silt loam; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary. 7 to 9 inches thick.

A2—7 to 9 inches, brown (10YR 5/3) cherty silt loam; weak, medium, subangular blocky structure; very friable; medium acid; clear, smooth boundary. 4 to 8 inches thick.

B1t—9 to 14 inches, reddish-brown (5YR 4/4) cherty silty clay loam; weak, medium, angular blocky structure; friable; strongly acid; gradual, smooth boundary. 3 to 7 inches thick.

B21t—14 to 20 inches, yellowish-red (5YR 5/6 or 5YR 4/6) to red (2.5YR 4/6) cherty silty clay loam; moderate and strong, medium, angular blocky structure; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; noticeable clay films on peds; few, small, black concretions; strongly acid; gradual, smooth boundary. 4 to 8 inches thick.

B22t—20 to 28 inches, yellowish-red (5YR 4/6) to red (2.5YR 4/6) cherty silty clay; strong, fine and medium, angular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; pronounced clay films on peds; few, small, black concretions; strongly acid; gradual, wavy boundary. 6 to 12 inches thick.

B3t—28 to 40 inches, variegated dark-red (10R 3/6), reddish-brown (5YR 4/4), yellowish-brown (10YR 5/6), and yellow (10YR 7/8) cherty silty clay or clay; many, fine and medium, distinct variegations; moderate, coarse, angular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; noticeable clay films on some peds; strongly acid; diffuse, wavy boundary. 10 to 18 inches thick.

C—40 to 44 inches +, primarily a chert bed, with interstices filled with clay or silty clay that is mixed red (2.5YR 4/6), light gray (10YR 7/2), light yellowish brown (10YR 6/4), strong brown (7.5YR 5/6), and reddish brown (5YR 4/3); hard when dry, firm when moist, sticky and plastic when wet; strongly acid. 1 foot or more thick.

The Ap horizon is dark brown (10YR 3/3) in places. The B21t horizon is red (2.5YR 4/6) and the B22t horizon is dark red (2.5YR 3/6) in some profiles. The depth to chert beds or bedrock and the amount of chert throughout the profile are extremely variable. In places pockets of sandy material occur in the B3 and C horizons. If the soils are uneroded, cherty silt loam is the most common type; if the soils are eroded, cherty silty clay loam is common.

BODINE SERIES

The Bodine series consists of highly weathered, excessively drained Sols Bruns Acides that developed in residuum weathered from very cherty limestone. In most places the soils are strongly sloping or moderately steep.

Bodine soils are moderately extensive and are widely distributed in the central and southern parts of the county. They occur in close association with Baxter, Mountview, Westmoreland, and Clarksville soils. Their B horizon is less distinctly developed than that of Baxter and Clarksville soils, and they are coarser textured and more yellowish than those soils. They are more cherty than Mountview soils, and they lack a B horizon of clay accumulation, which is present in those soils. Bodine soils are much more cherty than Westmoreland soils, which formed in residuum weathered from interbedded limestone, shale, and sandstone.

Profile of Bodine cherty silt loam, 12 to 20 percent slopes, in a pasture along State Highway 163, about 1½ miles south of Edmonton:

Ap—0 to 7 inches, brown (10YR 5/3) to pale-brown (10YR 6/3) cherty silt loam; weak, fine, granular structure and weak, medium, subangular blocky; friable; common flaggy and porous fragments of chert; strongly acid; gradual, smooth boundary. 7 to 9 inches thick.

B—7 to 18 inches, yellowish-brown (10YR 5/4 or 10YR 5/6) cherty heavy silt loam; weak, medium, subangular blocky structure; friable; abundance of highly weathered, flaggy, porous chert resembling siltstone; very strongly acid. 6 to 14 inches thick.

C1—18 to 23 inches, variegated yellowish-brown (10YR 5/8), yellowish-red (5YR 4/6), and pale-brown (10YR 6/3) cherty silty clay loam; weak, fine and medium, angular blocky structure; firm; abundance of weathered, flaggy, porous chert that is brownish-yellow (10YR 6/6) to strong brown (7.5YR 5/6); very strongly acid. 4 to 6 inches thick.

C2—23 to 29 inches +, brownish-yellow (10YR 6/8), highly weathered, flaggy, porous chert beds, resembling slabs of siltstone with yellowish-brown (10YR 5/6 or 10YR 5/8) silty clay in the interstices; firm; very strongly acid. Probably several feet thick.

The color of the A horizon ranges from dark grayish brown (10YR 4/2) to pale brown (10YR 6/3). In places the color of the C horizon is brownish yellow (10YR 6/6), yellowish brown (10YR 5/6), or strong brown (7.5YR 5/8). The soil contains fine sand in places where the chert beds are underlain by a thin stratum of fine-grained sandstone at a depth of about 3 feet. The chert is flaggy in some profiles but is angular in others. The thickness of the solum ranges from 20 to 36 inches or more.

CANEYVILLE SERIES

The Caneyville series consists of shallow and moderately deep, steep and moderately steep, well-drained Red-Yellow Podzolic soils that formed under hardwood forest in residuum weathered from limestone, sandstone, and shale. Outcrops of limestone cover 2 to 10 percent of the surface.

Caneyville soils are extensive in the extreme eastern and northeastern parts of the county and occupy small areas in other parts of the county. They occur with Talbott, Westmoreland, and Christian soils. They are more sandy than Talbott soils, and their B horizon is less plastic than that of those soils. They are more strongly developed than Westmoreland soils and have a redder B horizon. In most places they are deeper than those soils. Caneyville soils are thinner than Christian soils and have a less strongly developed profile.

Profile of Caneyville loam (in an area of Caneyville rocky complex, 20 to 30 percent slopes) in a cultivated field along a county road near U.S. Highway 68, about 3 miles north of Edmonton and 1 mile east of Cork:

Ap—0 to 7 inches, yellowish-brown (10YR 5/4) loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 5 to 8 inches thick.

B2t—7 to 24 inches, yellowish-red (5YR 4/6) silty clay; moderate, medium, subangular blocky structure; very firm;

few, small, black concretions; few, small, yellowish-brown (10YR 5/4) sand pockets; strongly acid; clear, wavy boundary. 6 to 18 inches thick.

B3t—24 to 28 inches, yellowish-red (5YR 4/6) sandy clay; common, small, distinct variegations of strong brown (7.5YR 5/8) and yellowish brown (10YR 5/6); moderate, medium, subangular blocky structure; firm; medium acid; common, small, black concretions; gradual, wavy boundary. 3 to 8 inches thick.

C—28 to 34 inches, strong-brown (7.5YR 5/8) silty clay; common, medium, distinct variegations of yellowish red (5YR 4/6), yellowish brown (10YR 5/8), and light yellowish brown (2.5Y 6/4); strong, medium, subangular blocky structure; firm when moist, sticky and plastic when wet; few, small, black concretions; slightly acid; abrupt, smooth boundary. 4 to 10 inches thick.

R—34 inches +, limestone and sandstone or shale bedrock.

The Ap horizon, or the A1 horizon if present, is brown (10YR 4/3), dark yellowish brown (10YR 4/4), or dark brown (7.5YR 3/2). The texture of the A horizon ranges from silt loam to fine sandy loam. In places the B2 horizon is strong brown (7.5 YR 5/6) or yellowish brown (10YR 5/6) in color and clay loam or sandy clay in texture. In some small areas the B horizon is yellow (10YR 7/6) to olive (5Y 5/4), very plastic clay. In some places the soils are less acid in the B3 and C horizons than in the upper parts of the profile. The depth to bedrock ranges from 1½ to 3 feet. In areas where the underlying material is predominantly limestone, Caneyville soils resemble Talbott soils; where the underlying material is predominantly shale and sandstone, they resemble Westmoreland soils.

CAPTINA SERIES

The Captina series consists of moderately well drained Red-Yellow Podzolic soils that have a fragipan. These soils developed in old alluvium washed from uplands underlain by limestone and mixed rocks. In places the parent alluvium has been influenced by loess.

Captina soils are widely distributed in the county. They are closely associated with the well-drained Elk soils and the poorly drained Taft and Robertsville soils, which formed in similar parent material. Their fragipan distinguishes them from Elk soils. They differ from those soils, also, in having mottles in their B horizon. Captina soils are browner than Taft and Robertsville soils and lack the pronounced mottling in the upper part of the B horizon that characterizes those soils. In drainage characteristics they resemble Landisburg soils.

Profile of Captina silt loam, 2 to 6 percent slopes, in a cultivated area near Goodluck:

Ap—0 to 8 inches, brown (10YR 4/3) silt loam; fine, granular structure; friable; medium acid; clear, smooth boundary. 7 to 10 inches thick.

B1—8 to 16 inches, yellowish-brown (10YR 5/4) heavy silt loam; weak, medium, subangular blocky structure; friable; strongly acid; gradual, smooth boundary. 3 to 11 inches thick.

B2—16 to 24 inches, yellowish-brown (10YR 5/4) silty clay loam; few, fine, distinct, light brownish-gray (10YR 6/2) mottles in lower 4 inches; weak, medium, subangular blocky structure; friable; slightly sticky when wet; strongly acid; gradual, wavy boundary. 6 to 12 inches thick.

B1—24 to 30 inches, yellowish-brown (10YR 5/4) silt loam or silty clay loam; common, fine, distinct, strong-brown (7.5YR 5/8) and light brownish-gray (10YR 6/2) mottles; weak, medium, angular blocky structure; firm; compact and brittle; very strongly acid; clear, smooth boundary. 5 to 12 inches thick.

B2—30 to 42 inches, mottled yellowish-brown (10YR 5/6), light-gray (10YR 7/2), and brown (7.5YR 4/4) silty clay loam; mottles are fine and distinct; medium, angular blocky structure; firm; compact and brittle; many, small, black concretions; strongly acid; clear, smooth boundary. 6 to 16 inches thick.

C—42 to 46 inches +, partly weathered old alluvium, consisting of stratified silt, clay, sand, and waterworn pebbles; moderate, medium, angular blocky structure; few brown and black concretions; very strongly acid.

The color of the Ap horizon is dark grayish brown (10YR 4/2) in places. Some profiles have B1 and B3 horizons, but others do not. A few small pebbles of chert occur in places. The depth to the fragipan ranges from 20 to 30 inches.

CHRISTIAN SERIES

The Christian series consists of well-drained Red-Yellow Podzolic soils that developed in residuum weathered from interbedded limestone and sandstone, with a smaller proportion of shale. Some areas are rocky.

Christian soils are of moderate acreage and are well distributed throughout the county. They occur on gently sloping to moderately steep uplands in geographic association with Dickson, Baxter, Dewey, Caneyville, and Talbott soils. They lack the fragipan of Dickson soils, and their subsoil is redder than that of those soils. Christian soils differ from Baxter soils in having more sand and less chert throughout the profile and in being more friable in the upper part of their B horizon. Because of the sandstone component of their parent material, Christian soils are higher in content of sand than Dewey and Talbott soils. Also, the upper part of the B horizon of Christian soils is less reddish than the corresponding part of Dewey and Talbott soils. Christian soils are of the same catena as Caneyville soils, but they have a thicker solum than those soils, a more distinct B horizon, and fewer rock outcrops.

Profile of Christian loam, 2 to 6 percent slopes, in a cultivated area along State Highway 496, west of Subtle:

Ap—0 to 8 inches, brown (10YR 5/3) loam; weak, fine, granular structure; friable; medium acid; gradual, smooth boundary. 6 to 9 inches thick.

A2—8 to 14 inches, yellowish-brown (10YR 5/6) loam; common, small, distinct variegations of pale brown (10YR 6/3) and strong brown (7.5YR 5/6); weak, fine, granular structure; friable; strongly acid; gradual, wavy boundary. 3 to 7 inches thick.

B2t—14 to 32 inches, red (2.5YR 4/6 to 2.5YR 4/8) silty clay; common, medium, distinct variegations of brownish yellow (10YR 6/6 to 10YR 6/8); moderate, fine and medium, subangular blocky structure; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; few small sand pockets; very strongly acid; gradual, wavy boundary. 14 to 25 inches thick.

B3—32 to 51 inches, red (2.5YR 4/6 to 2.5YR 4/8) or yellowish-red (5YR 4/6 to 5YR 4/8) silty clay loam; common, medium, distinct variegations of brownish yellow (10YR 6/6 to 10YR 6/8); weak, fine and medium, subangular blocky structure; very hard when dry, firm when moist, slightly sticky and slightly plastic when wet; pockets of sandy material are common; very strongly acid; gradual, wavy boundary. 12 to 22 inches thick.

IIC—51 to 56 inches +, red (2.5YR 4/6 to 2.5YR 4/8), highly weathered, soft sandstone; common, medium, faint variegations of brownish yellow (10YR 6/6); moderate, medium and coarse, subangular blocky structure; hard when dry, slightly firm when moist; very strongly acid.

The Ap horizon is silt loam or clay loam in places. A strong-brown (7.5YR 5/6) B1 horizon occurs in some profiles. The color, texture, and consistence of the B3 and C horizons varies within short distances, reflecting the influence of the differing components of the underlying material. The thickness of the solum ranges from 36 to 50 inches. The depth to bedrock ranges from 4 to 6 feet.

CLARKSVILLE SERIES

The Clarksville series consists of well-drained Red-Yellow Podzolic soils that developed in residuum chiefly from cherty limestone but partly from siltstone.

Clarksville soils are common in the central and southern parts of the county and occur as small areas elsewhere. They are closely associated with Bodine and Baxter soils. Clarksville soils have a slightly finer textured, less cherty B horizon than Bodine soils. They are browner and have better defined horizons than those soils. They are less deep than Baxter soils, and their B horizon is less reddish and coarser textured than that of those soils.

Profile of Clarksville cherty silt loam, 6 to 12 percent slopes, eroded, in a cultivated area along State Highway 861:

Ap—0 to 5 inches, yellowish-brown (10YR 5/4) cherty silt loam; weak, fine, granular structure; very friable; medium acid; abrupt, smooth boundary. 5 to 7 inches thick.

B1—5 to 12 inches, yellowish-brown (10YR 5/6) cherty silt loam; weak, fine, subangular blocky structure; friable; strongly acid; gradual, smooth boundary. 4 to 10 inches thick.

B2t—12 to 24 inches, yellowish-brown (10YR 5/8) or strong-brown (7.5YR 5/8) cherty heavy silt loam; moderate, medium, subangular blocky structure; firm; very strongly acid; gradual, smooth boundary. 8 to 14 inches thick.

C—24 to 38 inches +, strong-brown (7.5YR 5/8) cherty silty clay loam; common, fine, faint, light brownish-gray (10YR 6/2) variegations; moderate, strong, subangular blocky structure; firm; many small and large pieces of chert; strongly acid.

The color of the Ap horizon is normally brown (10YR 5/3 or 10YR 4/3) in uneroded areas. The depth to chert beds ranges from 30 to 65 inches. Fragments of chert make up about 15 to 40 percent of the profile.

CRIDER SERIES

The Crider series consists of well-drained Red-Yellow Podzolic soils that formed partly in a thin mantle of loess and partly in limestone residuum. The upper horizons formed in loess and the lower horizons formed in residuum from cherty limestone.

Crider soils are extensive and are widely distributed throughout the county. They occupy gently sloping or sloping uplands in geographic association with Dickson, Baxter, Dewey, and Mountview soils. They differ from Dickson and Mountview soils in having browner or redder lower horizons. They lack the well-defined fragipan that characterizes Dickson soils. Because of their prominent silt mantle, they are less reddish in their lower horizons than Baxter and Dewey soils.

Profile of Crider silt loam, 2 to 6 percent slopes, in a cultivated area along State Highway 1413, north of Cave Ridge:

Ap—0 to 8 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary. 7 to 10 inches thick.

B1—8 to 14 inches, strong-brown (7.5YR 5/8) silt loam; weak, medium, subangular blocky structure; friable; medium acid; clear, smooth boundary. 5 to 12 inches thick.

B2t—14 to 24 inches, yellowish-red (5YR 4/6 to 5YR 4/8) silty clay loam; moderate, medium, subangular blocky structure; firm; common clay films; strongly acid; clear, smooth boundary. 8 to 14 inches thick.

B3t—24 to 37 inches, red (2.5YR 4/6) to yellowish-red (5YR 4/6) silty clay loam; moderate, medium, subangular blocky structure; firm; common clay films; few small chert fragments; strongly acid; gradual, smooth boundary. 12 to 16 inches thick.

C—37 to 40 inches +, variegated red (2.5YR 4/6 to 2.5YR 4/8) and yellowish-brown (10YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; firm; common small chert fragments; strongly acid.

In places the color of the Ap horizon is dark grayish brown (10YR 4/2) or brown (10YR 5/3). If the soil has not been plowed, it is dark grayish brown (10YR 4/2) or very dark grayish brown (10YR 3/2). The number of chert fragments in the C horizon ranges from few to many.

CUMBERLAND SERIES

The Cumberland series consists of well-drained Reddish-Brown Lateritic soils that developed in residuum weathered from cherty limestone. The topography is generally irregular, but in places these soils are on narrow slopes and are associated with the smoother areas of Pembroke soils.

Cumberland soils are of moderate extent in the northwestern part of the county and occupy small areas in other parts of the county. They are redder, darker colored, and finer textured than Baxter soils.

Profile of Cumberland cherty silt loam, 2 to 6 percent slopes, in a cultivated area along Savoyard Road, south of Park:

Ap—0 to 7 inches, dark-brown (7.5YR 4/4) cherty silt loam; weak, fine, granular structure; friable; neutral; clear, smooth boundary. 7 to 10 inches thick.

B1t—7 to 11 inches, red (2.5YR 4/6) cherty silty clay loam; moderate, medium, subangular blocky structure; few clay films; firm; slightly acid; clear, smooth boundary. 4 to 9 inches thick.

B21t—11 to 34 inches, dark-red (10R 3/6) cherty clay; strong, medium, subangular blocky structure; many clay films; hard when dry, firm when moist, sticky and plastic when wet; medium acid; gradual, smooth boundary. 10 to 25 inches thick.

B22t—34 to 46 inches, dark-red (2.5YR 3/6) cherty silty clay; few, common, distinct variegations of yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8); strong, medium, angular blocky structure; hard when dry, firm when moist, sticky when wet; many clay films; strongly acid; clear, wavy boundary. 5 to 12 inches thick.

C—46 to 50 inches +, dusky-red (10R 3/4) cherty clay variegated with red (10R 5/8); strong, medium, angular blocky structure; very firm; abundance of weathered chert; strongly acid.

In places the Ap horizon is dark brown (7.5YR 3/2) or dark reddish brown (5YR 3/3 to 5YR 3/4). Fragments of chert make up 15 to 45 percent of the profile. The thickness of the solum is between 4 and 8 feet in most places, but bedrock outcrops in a few places too small to be delineated in mapping. The depth to bedrock ranges from 5 to 9 feet.

DANDRIDGE SERIES

The Dandridge series consists of somewhat excessively drained Lithosols that are shallow over shale and shaly limestone bedrock. These soils developed in residuum from calcareous shale and shaly limestone. They are

slightly acid or neutral in reaction. In some areas they are stony.

Dandridge soils are widely distributed in Metcalfe County. They occupy gently sloping to steep uplands adjacent to Westmoreland, Mountview, Bodine, Clarksville, and Dickson soils. They are shallower than Westmoreland soils and have slightly weaker profile development. They are shallower than Mountview and Dickson soils and are less acid than those soils. Their B horizon is finer textured than that of Mountview and Dickson soils, and their parent material lacks a loess component. Unlike Bodine and Clarksville soils, Dandridge soils are free of chert. They are shallower than those soils and less acid.

Profile of Dandridge shaly silt loam, 12 to 20 percent slopes, in a cultivated area along State Highway 533, one-fourth of a mile northwest of East Fork Little Barren River:

Ap—0 to 7 inches, very dark grayish-brown (10YR 3/2) shaly silt loam; weak, fine, granular structure; friable; neutral; clear, smooth boundary. 7 to 9 inches thick.
B—7 to 15 inches, yellowish-brown (10YR 5/4) shaly silty clay loam; moderate, medium, subangular blocky structure; firm; few, small, black and gray fragments of weathered shale; neutral; clear, smooth boundary. 6 to 10 inches thick.
C—15 to 19 inches, light olive-brown (2.5Y 5/4) shaly heavy silty clay loam; moderate, medium, angular blocky structure; firm; neutral; clear, smooth boundary. 3 to 10 inches thick.
R—19 inches +, calcareous limestone bedrock.

Throughout the profile the color is closely associated with the color of the parent material. In various places the soils are pale brown (10YR 6/3), very dark grayish brown (10YR 3/2), dark grayish brown (10YR 4/2), light olive brown (2.5Y 5/4 to 2.5Y 5/6), yellowish brown (10YR 5/4 to 10YR 5/6) or dark brown (10YR 4/3). In places the texture of the Ap horizon is silt loam or silty clay loam. In places internal drainage is moderately slow or slow. The depth to calcareous shale or calcareous shaly limestone bedrock ranges from about 12 inches to 20 inches, depending upon the degree of erosion. (The established series description permits B horizons, even though Dandridge soils are classified as Lithosols.)

DEWEY SERIES

The Dewey series consists of well-drained, gently sloping to moderately steep Red-Yellow Podzolic soils that developed in residuum from slightly cherty, moderately high grade limestone. In some places loess was a minor component of the parent material.

Dewey soils are widely distributed throughout the county. They occur on uplands in association with Baxter, Dickson, Crider, and Christian soils. They differ from Baxter soils chiefly in being relatively free of chert to a depth of 4 to 6 feet. They are better drained than Dickson soils and have a redder B horizon. The Dickson soils have a moderately well developed fragipan, which Dewey soils lack. Dewey soils are less brown throughout the profile than Crider soils; the upper part of the Crider solum developed chiefly in loess. Dewey soils are less sandy than Christian soils; their B horizon is redder, more cherty, and less friable in the upper part than that of Christian soils, and they developed in residuum weathered from limestone instead of from mixed material.

Profile of Dewey silt loam, 6 to 12 percent slopes, eroded, in a cultivated area along State Highway 861:

Ap—0 to 7 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; medium acid; abrupt, smooth boundary. 7 to 10 inches thick.
A3—7 to 12 inches, strong-brown (7.5YR 5/6) or brown (10YR 4/3) silt loam; weak, medium, subangular blocky structure; friable; strongly acid; gradual, smooth boundary. 0 to 6 inches thick.
B1t—12 to 21 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, medium, subangular blocky structure; firm when moist, sticky and slightly plastic when wet; strongly acid; gradual, smooth boundary. 8 to 11 inches thick.
B2t—21 to 38 inches, red (2.5YR 4/8) silty clay; strong, medium, angular blocky structure; hard when dry, very firm when moist, sticky and plastic when wet; common clay films; few small fragments of weathered chert; very strongly acid; clear, smooth boundary. 16 to 24 inches thick.
B3t—38 to 44 inches +, yellowish-red (5YR 4/6) or reddish-brown (5YR 4/3 or 5YR 4/4) silty clay; few, fine, distinct variegations of pale brown (10YR 7/4) and yellowish brown (10YR 5/6); strong, medium, angular blocky structure; very firm; common clay films; few small fragments of weathered chert; very strongly acid.

The color of the Ap horizon may be yellowish brown (10YR 5/4) or brown (7.5YR 4/4). The combined thickness of the Ap and B1 horizons ranges from 16 to 30 inches. Some profiles lack a B1t horizon, and some have a C horizon at a depth of 3 feet or more. Bedrock is at a depth of 4 to 8 feet or more. In places a thin, discontinuous layer of loesslike silt occurs in the upper part of the solum.

DICKSON SERIES

The Dickson series consists of deep, moderately well drained Red-Yellow Podzolic soils that have a fragipan. These soils developed in residuum weathered from cherty limestone or in a mantle of loess over residuum.

Dickson soils are extensive and typically occupy gently sloping upland areas, chiefly in geographical association with Baxter, Crider, Dewey, Mountview, and Sango soils. They differ from Baxter, Crider, and Dewey soils in having a fragipan, a lighter colored A horizon, and a less reddish B horizon. They are better drained than Sango soils and have a weaker fragipan and a browner B horizon containing fewer mottles. They closely resemble the better drained Mountview soils, but they have a developed fragipan, which Mountview soils lack.

Profile of Dickson silt loam, 2 to 6 percent slopes, in a cultivated area along U.S. Highway 68, half a mile south of Dripping Spring Baptist Church:

Ap—0 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 7 to 9 inches thick.
B1—7 to 12 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, subangular blocky structure; friable; strongly acid; clear, wavy boundary. 3 to 10 inches thick.
B2t—12 to 23 inches, yellowish-brown (10YR 5/6) light silty clay loam; moderate, medium, subangular blocky structure; slightly firm; few, medium, dark-brown concretions in lower part; very strongly acid; gradual, smooth boundary. 8 to 18 inches thick.
Bx—23 to 34 inches, yellowish-brown (10YR 5/4) heavy silt loam; common, fine, faint mottles of brown (10YR 4/3) and light brownish gray (2.5Y 6/2); moderate, medium, angular blocky structure; clay films; firm;

very compact and brittle; strongly acid; gradual, wavy boundary. 5 to 24 inches thick.

Bb—34 to 40 inches +, mottled, yellowish-red (5YR 4/6), pale-yellow (5Y 7/3), and light-gray (5Y 7/2) silty clay loam; strong, medium, angular blocky structure; firm; many small fragments of chert; strongly acid.

The depth to the fragipan, except in the eroded phase, is about 20 to 30 inches. An A3 horizon occurs in some profiles. The depth to bedrock ranges from 4 to 5 feet or more. Some profiles have a C horizon instead of a Bb horizon. In places the Bx horizon consists of silty clay loam. The lower 3 or 4 inches of the B2 horizon is faintly mottled in some profiles.

ELK SERIES

The Elk series consists of well-drained Gray-Brown Podzolic soils that intergrade to Red-Yellow Podzolic soils. These soils developed in old alluvium derived chiefly from limestone.

Elk soils are on gently sloping terraces along the major streams in the county. They are the well-drained members of the Elk-Captina-Taft-Robertsville drainage sequence. They occupy a small total acreage but are widely distributed and locally important. Elk soils have a brown silt loam Ap horizon overlying a yellowish-brown silty clay loam B horizon. They do not have a fragipan. They are browner throughout than Captina, Taft, or Robertsville soils. They are better drained than Captina soils and much better drained than Taft and Robertsville soils.

Profile of Elk silt loam, 2 to 6 percent slopes, in a cultivated area along U.S. Highway 68, west of Edmonton:

Ap—0 to 9 inches, dark-brown (10YR 4/3 to 10YR 3/3) silt loam; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary. 7 to 14 inches thick.

A3—9 to 14 inches, dark yellowish-brown (10YR 4/4) heavy silt loam; moderate, medium, subangular blocky structure with a tendency to be platy; friable; strongly acid; clear, smooth boundary. 4 to 10 inches thick.

B21t—14 to 32 inches, yellowish-brown (10YR 5/8) silty clay loam; moderate, fine and medium, subangular blocky structure; clay films; friable; very strongly acid; gradual, smooth boundary. 10 to 20 inches thick.

B22t—32 to 38 inches, yellowish-brown (10YR 5/6) silty clay loam; few, fine, distinct, light-gray (10YR 7/2) and pale-brown (10YR 6/3) mottles in the lower part; moderate, medium, subangular blocky structure; clay films; slighty firm; few small waterworn pebbles in lower part; very strongly acid; clear, smooth boundary. 4 to 8 inches thick.

C—38 to 52 inches +, brownish-yellow (10YR 6/6) to yellowish-brown (10YR 5/6) sandy loam; few, medium, distinct, pale-brown (10YR 6/3) and dark-brown (10YR 3/3) mottles; weak, fine, granular structure and weak, medium, subangular blocky structure; friable; many small waterworn pebbles that increase in number with depth; extremely acid. 10 to probably 40 inches thick.

The Ap horizon ranges in color from dark grayish brown (10YR 4/2) to dark brown (10YR 3/3). Some profiles lack an A3 horizon. The thickness of the solum ranges from about 3 to about 5 feet. In places the B horizon is yellowish red (5YR 5/8). The B21t horizon has a higher chroma and the B22t and the C horizons are slightly more acid than those of Elk soils in other areas.

HUMPHREYS SERIES

The Humphreys series consists of well-drained Red-Yellow Podzolic soils that developed in alluvium or colluvium derived mainly from cherty limestone but partly from acid sandstone and shale.

Humphreys soils are of moderate extent and are widely distributed. They occur on gently sloping or sloping stream terraces, alluvial fans, and foot slopes in association with Captina, Landisburg, and Taft soils. They are better drained and more cherty than Captina soils. Their A horizon is browner than that of Captina soils, and they lack a fragipan. They are browner throughout the profile than Landisburg and Taft soils, which have a fragipan.

Profile of Humphreys cherty silt loam, 2 to 6 percent slopes, in a cultivated area along U.S. Highway 68, west of Edmonton:

Ap—0 to 8 inches, brown (10YR 4/3) cherty silt loam; weak, fine, granular structure; friable; slightly acid; clear, smooth boundary. 7 to 9 inches thick.

B1—8 to 14 inches, brown (7.5YR 4/4) cherty silt loam; weak, fine and medium, subangular blocky structure; friable; strongly acid; gradual, smooth boundary. 4 to 8 inches thick.

B2t—14 to 38 inches, yellowish-brown (10YR 5/6) cherty heavy silt loam or silty clay loam; weak to moderate, medium, subangular blocky structure; slightly firm; few clay films; strongly acid; clear, smooth boundary. 16 to 20 inches thick.

C—38 to 42 inches +, stratified beds of gravel and chert; predominantly brown, yellow, and gray.

The color of the A horizon ranges from brown (10YR 5/3) to dark brown (10YR 3/3). Chert and gravel are common throughout the profile in most places, but the amount varies from place to place.

HUNTINGTON SERIES

The Huntington series consists of well-drained Alluvial soils that developed in alluvium washed mainly from upland soils underlain by limestone, but partly from soils underlain by shale and sandstone. The soils are neutral or medium acid.

Huntington soils are widely distributed. They are the well-drained members of the Huntington-Lindside-Newark-Melvin drainage sequence. They are better drained and darker brown than Lindside soils. They have fewer mottles than those soils, and the mottles occur deeper in the profile.

Profile of Huntington silt loam in a cultivated area along U.S. Highway 68, west of Edmonton and north of Rogers Creek bridge:

Ap—0 to 22 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; slightly acid; gradual, smooth boundary. 14 to 30 inches thick.

C1—22 to 42 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; medium acid; gradual, smooth boundary. 25 to 38 inches thick.

C2—42 to 52 inches +, dark-brown (10YR 3/3) silt loam; few, fine, faint mottles of pale brown (10YR 6/3); weak, fine and medium, granular structure; friable; medium acid.

The color of the Ap horizon ranges from very dark grayish brown (10YR 3/2) to dark yellowish brown (10YR 3/4). Some profiles are mottled below a depth of 36 inches, and some are free of mottles to a depth of 5 feet.

In places the C horizon has weak, medium or coarse, subangular blocky structure.

LANDISBURG SERIES

The Landisburg series consists of light-colored, medium-textured, moderately well drained Red-Yellow Podzolic soils that developed in material that washed or rolled from soils developed in residuum weathered mainly from low-grade cherty limestone, but partly from sandstone and shale.

Landisburg soils are of moderate extent and are widely distributed on foot slopes and stream terraces in the central and southern parts of the county. They are gently sloping or sloping. They have a fragipan, which restricts drainage and oxidation and limits the depth to which roots can penetrate. They are the moderately well drained member of the Humphreys-Landisburg-Taft-Robertsville drainage sequence. They differ from Humphreys soils in being lighter colored and less well drained and in having a fragipan. They are better drained than Taft soils and have fewer mottles.

Profile of Landisburg silt loam, 2 to 6 percent slopes, in a cultivated area along U.S. Highway 68, about 4 miles west of Edmonton:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 7 to 10 inches thick.

B1—8 to 13 inches, light yellowish-brown (10YR 6/4) silt loam; weak, fine, granular and angular blocky structure; friable; strongly acid; gradual, smooth boundary. 4 to 6 inches thick.

B2—13 to 24 inches, brownish-yellow (10YR 6/6) silt loam; weak, medium, subangular blocky structure; friable; peds are coated with light-gray silt; strongly acid; clear, wavy boundary. 9 to 15 inches thick.

Bx—24 to 50 inches, mottled brownish-yellow (10YR 6/6), very pale brown (10YR 7/3), and strong-brown (7.5YR 5/8) silty clay loam; mottles are common, fine, distinct; moderate, medium, subangular blocky structure; clay films; firm; compact and brittle; few, small, dark-brown and black concretions; peds are coated with light-gray silt; strongly acid; gradual, wavy boundary. 8 to 30 inches thick.

Cx—50 to 52 inches +, mottled yellowish-brown (10YR 5/6), gray (10YR 6/1), and strong-brown (7.5YR 5/8) silt loam; mottles are common, fine or medium, and faint or distinct; moderate, medium, angular blocky structure; firm; compact and brittle; common, small, brown and black concretions; common fragments of weathered chert, increasing in number with depth; strongly acid.

The color of the A horizon ranges from light brownish gray (10YR 6/2) to dark brown (10YR 4/3). The depth to the fragipan ranges from 20 to 30 inches. Some areas of Landisburg soils are cherty.

LINDSIDE SERIES

The Lindside series consists of deep, moderately well drained members of the Huntington-Lindside-Newark-depressions. These soils developed in alluvium washed mainly from upland soils underlain by limestone but partly from soils underlain by shale and sandstone.

Lindside soils are of small total acreage but are widely distributed in the county. They are the moderately well drained member of the Huntington-Lindside-Newark Melvin drainage sequence. They are lighter brown than Huntington soils and have mottles nearer the surface. The mottles are gray. Lindside soils are browner and less grayish than Newark soils, and they have fewer mottles.

Profile of Lindside silt loam in a cultivated area along State Highway 1243, northwest of Savoyard:

Ap—0 to 10 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; slightly acid; clear, smooth boundary. 5 to 10 inches thick.

C1—10 to 18 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; slightly acid; gradual, smooth boundary. 5 to 14 inches thick.

C2—18 to 30 inches, brown (10YR 5/3) silt loam; common, fine, faint mottles of light gray, light brownish gray, and pale brown; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 6 to 18 inches thick.

C3—30 to 46 inches +, light brownish-gray (10YR 6/2 or 2.5Y 6/2) silt loam; common, medium, distinct mottles of grayish brown, light yellowish brown, and dark yellowish brown; moderate, medium, angular blocky structure, or massive; slightly firm; few, small, dark-brown concretions; few small pebbles of chert; medium acid.

The color of the Ap horizon ranges from brown (10YR 5/3) to dark brown (10YR 3/3 or 7.5YR 3/2) or dark yellowish brown (10YR 4/4). In places the C1 horizon is brown, yellowish brown, or dark yellowish brown. The soils are commonly slightly acid or medium acid, but in some places they are strongly acid in the lower part of the profile. In most places the depth to a mottled horizon ranges from 15 to 30 inches.

MELVIN SERIES

The Melvin series consists of poorly drained, medium acid or slightly acid Low-Humic Gley soils of bottom lands and upland depressions. The soils developed mainly in recent alluvium washed from upland soils underlain by limestone but partly in sediments derived from sandstone and shale.

Melvin soils are of moderate total acreage. They occur mainly in relatively large depressions in the northwestern part of the county. They are the poorly drained members of the Huntington-Lindside-Newark-Melvin drainage sequence. They are more poorly drained, grayer, and more mottled than Newark soils.

Profile of Melvin silt loam in a pasture along State Highway 1243, northwest of Savoyard:

Ap—0 to 8 inches, dark grayish-brown (2.5Y 4/2) silt loam; common, fine, faint mottles of light gray (2.5Y 7/1); weak, fine, granular structure; very friable; slightly acid; clear, smooth boundary. 5 to 10 inches thick.

C1g—8 to 16 inches, dark-gray (5Y 4/1) silt loam; few, fine, faint mottles of pale olive and dark reddish brown; weak, fine, granular structure; very friable; slightly acid; gradual, smooth boundary. 7 to 12 inches thick.

C2g—16 to 50 inches +, gray (5Y 6/1) silt loam; common, fine, distinct mottles of reddish brown and yellowish brown; massive; friable to firm; slightly acid.

The color of the Ap horizon ranges from light brownish gray (10YR 6/2) to dark gray (5Y 4/1).

MOUNTVIEW SERIES

The Mountview series consists of well-drained Red-Yellow Podzolic soils that developed in a thin mantle of loess over residuum from cherty limestone.

Mountview soils are moderately extensive. They occupy dominantly gently sloping or sloping upland areas and are commonly associated with Bodine, Clarksville, Dickson,

Westmoreland, Crider, and Sango soils. They most nearly resemble Dickson, Crider, and Clarksville soils. They differ from Dickson and Sango soils in being better drained and in lacking a well-developed fragipan. They are lighter colored throughout the profile and less reddish in the B horizon than Crider soils. The upper part of the solum of Mountview soils developed in loess, which is lacking in the parent material of Clarksville, Bodine, and Westmoreland soils.

Profile of Mountview silt loam, 2 to 6 percent slopes, in a cultivated area along State Highway 1413, north of the junction with State Highway 640:

Ap—0 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; strongly acid; abrupt, smooth boundary. 7 to 10 inches thick.

B1—7 to 12 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium, subangular blocky structure; friable; strongly acid; gradual, smooth boundary. 4 to 8 inches thick.

B2t—12 to 30 inches, yellowish-brown (10YR 5/8) heavy silt loam; moderate, medium, subangular blocky structure; friable; few, small, brown concretions; strongly acid; gradual, smooth boundary. 9 to 18 inches thick.

B3t—30 to 40 inches, strong-brown (7.5YR 5/6) silty clay loam; common, fine, distinct variegations of yellowish brown (10YR 5/6), light gray (10YR 6/1), and yellowish red (5YR 4/6); strong, medium, angular blocky structure; firm; few, small, brown concretions; strongly acid; gradual, smooth boundary. Up to 25 inches thick.

C—40 to 46 inches +, variegated dark-red (2.5YR 3/6), yellowish-brown (10YR 5/6), and light-gray (10YR 6/1) clay; strong, medium, angular blocky structure; very firm; few small fragments of chert; few clay films; strongly acid.

The color of the Ap horizon ranges from dark grayish brown (10YR 4/2) to yellowish brown (10YR 5/4) or light yellowish brown (10YR 6/4). If the soil has not been plowed, the A1 horizon is commonly very dark grayish brown (10YR 3/2), and the A2 horizon is pale brown (10YR 6/3) or light yellowish brown (10YR 6/4). In places the B1 horizon is light yellowish brown (10YR 6/4). In places the B2 horizon is as red as, but not redder than, strong brown (7.5YR 5/6). In some profiles the texture of the B2 horizon is silty clay loam. A mottled, slightly compacted layer, less than 4 inches thick, occurs in some profiles. If present, the compacted layer is normally in the form of a thin, weak fragipan between the B2 and B3 horizons. In some profiles a B2b horizon is present and a thin, compacted layer occurs between the B2 and B2b horizons. In places a few small fragments of chert occur in the upper part of the solum. The fragments are common in the B2b and C horizons.

MUSE SERIES

The Muse series consists of well-drained Red-Yellow Podzolic soils that developed in old colluvium derived from uplands underlain chiefly by acid shale.

Muse soils occupy a minor acreage on foot slopes, mainly in the eastern part of the county along South Fork Little Barren River. They are associated with Landisburg soils. They are better drained and finer textured than Landisburg soils and lack a fragipan.

Profile of Muse silt loam, 6 to 12 percent slopes, in a cultivated area near the Ravena School, southeast of the junction of State Highway 533 and the county road:

Ap—0 to 7 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 7 to 10 inches thick.

B1t—7 to 12 inches, strong-brown (7.5YR 5/8) silty clay loam; moderate, medium, subangular blocky structure; firm; few small fragments of weathered shale; strongly acid; clear, smooth boundary. 4 to 8 inches thick.

B2t—12 to 25 inches, yellowish-red (5YR 4/8) silty clay; moderate, medium, angular blocky structure; firm; few small fragments of chert; few clay films; strongly acid; clear, smooth boundary. 10 to 18 inches thick.

B3t—25 to 37 inches, yellowish-red (5YR 4/6) silty clay; common, medium, distinct variegations of brown (10YR 5/3), light olive brown (2.5Y 5/4), and light brownish gray (2.5Y 6/2); strong, medium, angular blocky structure; firm; common clay films; fragments of weathered shale are common; strongly acid; clear, smooth boundary. 4 to 14 inches thick.

C—37 to 40 inches +, variegated red (2.5YR 5/8), yellowish-brown (10YR 5/6), and light-gray (10YR 7/2) clay or silty clay loam; moderate, medium, angular blocky structure; firm; common small fragments of shale; strongly acid.

The texture of the B horizon ranges from heavy silty clay loam to silty clay. In places the soil contains fragments of chert derived from formations overlying the shale.

NEWARK SERIES

The Newark series consists of somewhat poorly drained, medium acid or slightly acid Alluvial soils that formed in sediments washed from upland soils. Although the alluvium was derived largely from limestone, a minor component was from sandstone and shale.

Newark soils are of moderate total acreage and are widely distributed in the county. They are the somewhat poorly drained members of the Huntington-Lindside-Newark-Melvin drainage sequence. They are more poorly drained than Lindside soils and are grayer and more mottled in the upper part of the solum. They are better drained and less grayish in the upper part than Melvin soils.

Profile of Newark silt loam in a cultivated area along State Highway 1243, northwest of Savoyard:

Ap—0 to 8 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary. 6 to 10 inches thick.

C1—8 to 12 inches, brown (10YR 4/3) silt loam; common, fine, faint mottles of light brownish gray and yellowish brown; weak, fine, granular structure; very friable; slightly acid; gradual, smooth boundary. 3 to 10 inches thick.

C2—12 to 16 inches, grayish-brown (10YR 5/2) silt loam; many, fine, faint mottles of yellowish brown and light gray; weak, fine, granular structure; friable; slightly acid; clear, smooth boundary. 3 to 10 inches thick.

C3g—16 to 26 inches, grayish-brown (2.5Y 5/2) silt loam; common, fine, distinct mottles of yellowish brown and light olive brown; massive; friable; slightly acid; gradual, smooth boundary. 8 to 16 inches thick.

C4g—26 to 48 inches +, gray (10YR 5/1) silt loam; common, fine, distinct mottles of yellowish brown and dark yellowish brown; massive; friable; slightly acid. 1 foot to several feet thick.

In places the texture is silty clay loam, particularly in the lower horizons. In places the color of the Ap horizon is dark brown (10YR 4/3) or dark reddish brown (5YR 4/4). The color of the C1 and C2 horizons is brown (10YR 5/3) in some profiles. In places the C3g and C4g horizons are gray (N 5/1 or N 6/1) and unmottled.

PEMBROKE SERIES

The Pembroke series consists of well-drained Red-Yellow Podzolic soils that developed in limestone residuum covered with a thin mantle of loess. The upper part of the solum has been influenced to some extent by the loess or by loesslike material; the lower part is more characteristic of soils that developed in high-grade limestone residuum. The loess normally makes the upper part of the solum softer and more friable than the lower part.

Pembroke soils are of comparatively small acreage but are widely distributed. They are mainly in gently sloping areas but occur also in karst areas and on sloping uplands. They are associated with Cumberland, Baxter, Christian, and Crider soils. They differ from Cumberland, Baxter, and Christian soils in having a more friable B horizon and a thin mantle of loess. They are darker colored at the surface than Crider soils and are more reddish in the A and B horizons than those soils. Their mantle of loess is less prominent than that of Crider soils.

Profile of Pembroke silt loam, 2 to 6 percent slopes, in a cultivated area near Edmonton:

Ap—0 to 7 inches, dark reddish-brown (5YR 3/4) silt loam; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary. 7 to 10 inches thick.

B1—7 to 16 inches, yellowish-red (5YR 4/6) silt loam; moderate, medium, subangular blocky structure; few peds faintly coated with pale-brown silt; friable; few, small, black and brown concretions; medium acid; clear, smooth boundary. 6 to 14 inches thick.

B21t—16 to 29 inches, red (2.5YR 4/6) or dark-red (2.5YR 3/6) silty clay loam; moderate, medium, subangular blocky structure; few peds thinly coated with pale-brown silt; slightly firm; few, small, brown concretions; medium acid; gradual, smooth boundary. 10 to 20 inches thick.

B22t—29 to 40 inches, dark-red (2.5YR 3/6) silty clay loam; common, fine, faint variegations of strong brown (7.5YR 5/8) and pale brown (10YR 6/3); moderate, medium, subangular blocky structure; firm; few, small, brown and black concretions; medium acid; gradual, smooth boundary. 6 to 14 inches thick.

B23t—40 to 51 inches +, red (2.5YR 4/8) silty clay loam; moderate, medium, subangular blocky structure; few peds coated with light-brown silt; firm; few, small, brown concretions; medium acid.

The color of the A horizon normally ranges from dark brown (10YR 4/3) to dark reddish brown (5YR 3/2). In places the color of the B horizon is darker or lighter than that of the representative profile. The thickness of the solum ranges from about 40 inches to 60 inches or more.

RENOX SERIES

The Renox series consists of well-drained Gray-Brown Podzolic soils on foot slopes, benches, and fans. These soils have weak horizonation. They developed in mixed colluvium that rolled or washed from upland soils, such as those of the Westmoreland, Baxter, and Bodine series. The material was derived chiefly from gray and black shale, from cherty limestone, and from sandstone.

Renox soils are of small total acreage, but they are locally important because they occur along the southern border of the county where cropland is scarce. Their parent material differs from that of Muse soils, which formed in material derived almost entirely from shale. Renox soils have a darker colored Ap horizon and less well-defined horizonation than Muse soils. Their B horizons are coarser textured than those of Muse soils. They are better drained than Landisburg soils and lack a fragipan.

Profile of Renox silt loam, 6 to 12 percent slopes, in a cultivated area along State Highway 90, east of Willow Shade:

Ap—0 to 9 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; few small fragments of chert; medium acid; gradual, smooth boundary. 7 to 10 inches thick.

A3—9 to 15 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, subangular blocky structure; friable; few small fragments of chert; medium acid; gradual, smooth boundary. Up to 10 inches thick.

B1—15 to 21 inches, brown (7.5YR 4/4) shaly heavy silt loam or shaly silty clay loam, with a slight variegation of yellowish brown (10YR 5/4) when dry; moderate, fine and medium, subangular blocky structure; firm; common, very small, black concretions; a little fine chert gravel; strongly acid; gradual, smooth boundary. 4 to 12 inches thick.

B2t—21 to 36 inches, brown (7.5YR 4/4) or dark yellowish-brown (10YR 4/4) shaly silty clay loam; common, fine, distinct variegations of light yellowish brown (10YR 6/4) when dry; moderate, medium, subangular blocky structure; firm when moist, hard when dry; common, small, black concretions; a little chert gravel; strongly acid; gradual, wavy boundary. 10 to 20 inches thick.

C—36 to 40 inches +, yellowish-brown (10YR 5/4 or 10YR 5/6) shaly silty clay loam; few, fine, distinct variegations of gray and light yellowish brown; massive; firm; a little fine chert gravel and a few fragments of sandstone; common, fine to coarse, black concretions; one-third or more, by volume, shale, chert, and sandstone; strongly acid.

The thickness of the solum ranges from about 36 inches to 52 inches. The amount and relative proportions of shale, chert, sandstone, and concretions in the profile vary from place to place. In places the Ap horizon is brown (10YR 4/3) or very dark brown (10YR 2/2). In places horizonation is slightly weaker or slightly stronger than that of the representative profile.

ROBERTSVILLE SERIES

The Robertsville series consists of poorly drained Planosols on stream terraces. They developed in old alluvium derived principally from soils underlain by limestone but partly from soils underlain by shale and sandstone. These soils have a fragipan.

Robertsville soils occupy level areas or slight depressions on stream terraces. Their total acreage is small, but they are widely distributed. They occur with Taft, Landisburg, and Humphreys soils. They are less well drained than those soils and are grayer throughout the solum. They contain less chert than Humphreys soils, which lack a fragipan.

Profile of Robertsville silt loam in a pasture along State Highway 861, southwest of Edmonton:

Ap—0 to 5 inches, grayish-brown (2.5Y 5/2) silt loam; common, medium, distinct mottles of yellowish brown (10YR 5/4); weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 4 to 8 inches thick.

A2—5 to 14 inches, light olive-gray (5Y 6/2) silt loam; common, fine, distinct mottles of olive yellow (2.5Y 6/6), brown (10YR 5/3), and dark yellowish brown (10YR 4/4); weak, medium, subangular blocky structure; friable; very strongly acid; clear, wavy boundary. 6 to 12 inches thick.

Bx—14 to 40 inches, mottled light-gray (5Y 7/2), yellowish-brown (10YR 5/6), pale-olive (5Y 6/3), and brown

(10YR 5/3) silty clay loam; mottles are common, medium, and distinct; weak, medium, angular blocky structure or massive; firm; compact and brittle; very strongly acid; gradual, wavy boundary. 15 to 30 inches thick.

Cg—40 to 45 inches +, light-gray (5Y 7/2) silty clay loam; many, coarse, prominent, strong-brown (7.5YR 5/6) and pale-olive (5Y 6/3) mottles; massive; hard when dry, very firm when moist, sticky and plastic when wet; few, small, black concretions and few, small pebbles; very strongly acid.

The color of the Ap horizon ranges from dark grayish brown (2.5Y 4/2 or 10YR 4/2) to pale brown (10YR 6/3). In places the A2 horizon is grayish brown (10YR 5/2). In places, especially in the lower horizons, there are small pebbles of chert. The depth to the fragipan ranges from 12 to 20 inches. In places the fragipan is not strongly expressed. In a few profiles the B horizon is silty clay or clay.

ROBINSONVILLE SERIES

The Robinsonville series consists of well-drained Alluvial soils of bottom lands. These soils formed in alluvium washed from upland soils derived from a mixture of sandstone, limestone, and shale.

Robinsonville soils are of relatively minor total acreage. They are associated with Huntington, Lindside, and Newark soils. They differ from Huntington soils in being coarser textured and more acid and in having a lighter colored A horizon. They differ from Lindside and Newark soils in being better drained and in having a coarser texture.

Profile of Robinsonville fine sandy loam in a cultivated area along U.S. Highway 68, adjacent to East Fork Little Barren River, about 11 miles north of Edmonton and 3 miles east of Sulphur Well:

Ap—0 to 12 inches, brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; friable; medium acid; gradual, smooth boundary. 5 to 12 inches thick.

C1—12 to 38 inches, dark-brown (10YR 4/3 or 10YR 3/3) fine sandy loam; weak, fine, granular structure; friable; medium acid; gradual, wavy boundary. 25 to 40 inches thick.

C2—38 to 48 inches +, brown (10YR 5/3) fine sandy loam; few, fine, faint mottles of grayish brown (10YR 5/2); weak, fine and medium, granular structure; friable; medium acid.

The color of the Ap horizon ranges from dark brown (10YR 4/3) to dark yellowish brown (10YR 4/4). In places mottles occur at a depth of 36 inches or more.

SANGO SERIES

The Sango series consists of moderately well drained Red-Yellow Podzolic soils that have a fragipan. These soils developed in residuum from low grade or moderately low grade limestone, capped in places with thin loess.

Sango soils are of moderate total acreage and are widely distributed in the county. They occupy nearly level or gently sloping areas in geographic association with Mountview, Baxter, Bodine, Dewey, and Dickson soils. They most nearly resemble Dickson soils, from which they differ in being less well drained and somewhat lighter colored throughout the solum. Also, the fragipan of Sango soils is thicker and more compact than that of Dickson soils.

Profile of Sango silt loam, 2 to 6 percent slopes, in a cultivated area near the junction of State Highways 218 and 314, north of Center:

Ap—0 to 7 inches, pale-brown (10YR 6/3) silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 7 to 10 inches thick.

B2—7 to 20 inches, light yellowish-brown (2.5Y 6/4) silt loam; weak, medium, angular blocky structure; friable; few, small, dark-brown concretions in lower part; strongly acid; clear, smooth boundary. 8 to 20 inches thick.

Bx1—20 to 30 inches, light yellowish-brown (2.5Y 6/4) silt loam; common, fine, distinct mottles of yellowish brown (10YR 5/8), light brownish gray (2.5Y 6/2), and light gray (2.5Y 7/2); moderate, medium, angular blocky structure; firm; compact and brittle; few, small, dark-brown concretions; strongly acid; clear, smooth boundary. 5 to 12 inches thick.

Bx2—30 to 43 inches +, mottled light yellowish-brown (2.5Y 6/4), strong-brown (7.5YR 5/6); light brownish-gray (10YR 6/2), and light-gray (2.5Y 7/2) heavy silt loam or silty clay loam; mottles are many, fine, and distinct; moderate, medium, subangular blocky structure; clay films; firm; compact and brittle; many, small, dark-brown and black concretions; strongly acid.

In places the color of the Ap horizon is brown (10YR 5/3) or grayish brown (2.5Y 5/2 or 10YR 5/2). In places the colors are somewhat paler than in the profile described. The depth to the fragipan ranges from about 20 inches to 28 inches.

TAFT SERIES

The Taft series consists of somewhat poorly drained Planosols that have a fragipan. These soils developed in old alluvium from sediments washed chiefly from limestone but partly from sandstone and shale. In places loess is an important component of the parent material.

Taft soils occupy nearly level terraces along most streams. Their total acreage is moderately small, but they are widely distributed. They are associated with such upland soils as Baxter, Bodine, Clarksville, Westmoreland, Dickson, Mountview, and Crider soils. They are also associated with the well drained Elk and Humphreys soils, the moderately well drained Captina and Landisburg soils, and the poorly drained Robertsville soils. Taft soils resemble Robertsville soils in parent material and position on the landscape, but they differ from those soils in being better drained and less grayish. They are more poorly drained than Captina and Landisburg soils and are mottled nearer the surface.

Profile of Taft silt loam in a pasture along County Road 640, one-fourth of a mile northwest of the bridge over South Fork Little Barren River:

Ap—0 to 9 inches, brown (10YR 5/3) silt loam; few, fine, faint mottles of brownish yellow; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary. 6 to 10 inches thick.

B1—9 to 16 inches, light yellowish-brown (10YR 6/4) silt loam; common, fine and medium, distinct mottles of light gray, brown, and strong brown; weak, medium, subangular blocky structure; friable; few, small, strong-brown concretions; strongly acid; gradual, smooth boundary. 5 to 11 inches thick.

Bx1—16 to 28 inches, mottled light yellowish-brown, light-gray, and brown silt loam; weak, medium, subangular blocky structure; firm; compact and brittle; few, small, soft, brown concretions; strongly acid; clear, smooth boundary. 4 to 14 inches thick.

Bx2—28 to 37 inches +, light brownish-gray (2.5Y 6/2) heavy silt loam; common, fine, distinct mottles of yellowish brown and brownish yellow; strong, medium, subangular blocky structure; firm; compact and brittle; very strongly acid.

The Ap horizon ranges from grayish brown (10YR 5/2) to dark grayish brown (10YR 4/2). The depth to the fragipan ranges from about 14 inches to 20 inches. Concretions do not occur in all profiles.

TALBOTT SERIES

The Talbott series consists of well-drained Red-Yellow Podzolic soils that developed in residuum from argillaceous limestone. If the soils are not eroded, they have an Ap horizon of dark yellowish-brown silt loam, underlain by a B horizon of yellowish-red, very firm, heavy plastic clay. There are a few rock outcrops.

Talbott soils occupy a small total acreage but are widely distributed. They occur in sloping upland areas in association with Caneyville, Baxter, and Westmoreland soils. They lack the sand content of Caneyville soils, and they have a more firm and more plastic B horizon than those soils. They have less chert and more clay in their B horizon than Baxter soils.

Profile of Talbott silt loam, 6 to 12 percent slopes, in a cultivated area along a county road, 1 mile southeast of the junction of State Highways 163 and 1520 and about 3 miles south of Beaumont:

Ap—0 to 7 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular structure; friable; slightly acid; clear, smooth boundary. 7 to 9 inches thick.

B1t—7 to 13 inches, yellowish-red (5YR 4/8) silty clay loam; strong, medium, angular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; few clay films; medium acid; gradual, smooth boundary. 4 to 8 inches thick.

B2t—13 to 27 inches, yellowish-red (5YR 5/8) clay; strong, fine and medium, angular blocky structure; hard when dry, very firm when moist, sticky and very plastic when wet; common clay films; few chert fragments; few, small, brown concretions; strongly acid; gradual, wavy boundary. 8 to 16 inches thick.

B3t—27 to 37 inches, variegated dark-red (2.5YR 3/6) and yellowish-brown (10YR 5/6) clay; strong, medium, angular blocky structure; hard when dry, very firm when moist, sticky and very plastic when wet; common clay films; common brown and black concretions; strongly acid; gradual, smooth boundary. 8 to 12 inches thick.

C—37 to 46 inches +, yellowish-brown (10YR 5/8) clay, variegated with red (2.5YR 4/6); variegations are common, fine and medium, and distinct; strong, medium, angular blocky structure; hard when dry, very firm when moist, sticky and very plastic when wet; common clay films; strongly acid.

In places the Ap horizon is brown (10YR 5/3) or dark brown (7.5YR 4/4). The depth to bedrock ranges from about 3 feet to 5 feet or more. Some profiles have no B1t horizon. In some profiles the color of the B2 horizon is reddish brown (5YR 4/3) or red (2.5YR 4/6). In a few small areas the B horizon is yellowish brown and fine textured.

WESTMORELAND SERIES

The Westmoreland series consists of moderately deep, somewhat excessively drained Gray-Brown Podzolic soils that intergrade to Red-Yellow Podzolic soils. These soils developed in residuum from calcareous shale and shaly limestone. They are medium acid to neutral.

Westmoreland soils are of moderate total acreage but are widely distributed, mostly in the eastern part of the county. They occur on gently sloping to steep uplands in association with Dandridge, Mountview, Bodine, Clarksville, and Dickson soils. They differ from Dandridge soils in being deeper over bedrock and in having slightly stronger profile development. They are shallower and less acid than Mountview and Dickson soils, and they lack a loess component. Unlike Bodine and Clarksville soils, they are free of chert. They are less acid than those soils and shallower over bedrock.

Profile of Westmoreland shaly silt loam, 12 to 20 percent slopes, in a cultivated area along State Highway 163, south of Lone Star Ridge:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) shaly silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 4 to 9 inches thick.

B2t—7 to 13 inches, yellowish-brown (10YR 5/6) shaly silty clay loam; common, fine, distinct splotches of yellow (10YR 7/6), especially noticeable when dry; moderate, medium, subangular blocky structure; firm; slightly acid; clear, smooth boundary. 4 to 8 inches thick.

C1—13 to 18 inches, brownish-yellow (10YR 6/6) shaly silty clay loam; common, fine, faint variegations of yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6); moderate, medium, subangular blocky structure; firm; slightly acid; clear, smooth boundary. 3 to 9 inches thick.

C2—18 to 25 inches, brown (10YR 4/3) shaly silty clay loam; common, fine, faint variegations of strong brown (7.5YR 5/6) and light olive brown (2.5Y 5/4); moderate, medium, subangular blocky structure; firm; slightly acid; clear, smooth boundary. 5 to 10 inches thick.

R—25 inches +, calcareous limestone.

The thickness of the profile over calcareous shale and shaly limestone ranges from 20 to 30 inches. In places the A horizon is brown (10YR 4/3). If an A1 horizon is present, it is very dark grayish brown (10YR 3/2). In places the B horizon is heavy silt loam.

General Nature of the County

This section gives general facts about Metcalfe County. It briefly discusses climate, geology, relief and drainage, agriculture, and industry and transportation. The agricultural statistics used are from the Bureau of the Census.

Climate [8]

Metcalfe County, like most of Kentucky, has a wide range in temperature between cold winters and warm summers. Precipitation is fairly well distributed throughout the year, but the average for the month of October is comparatively low. The climate is suitable for a variety of plant and animal life.

Records of climatological data have not been kept in Metcalfe County for long enough periods to furnish all of the information needed to prepare a summary. The weather station at Greensburg, 21 miles northeast of Edmonton, in Green County, has a long, uninterrupted record, and these data have been drawn upon in making estimates for Metcalfe County. The terrain in the two counties is similar, and the range in elevation about the same. Data from Greensburg, where used, are indicated as such.

In this county the average length of the growing season, from the last freezing temperature in spring to the first

[8] By A. B. Elam, Jr., State climatologist, U.S. Weather Bureau, Lexington, Kentucky.

TABLE 7.—*Probability of last freezing temperatures in spring and first in fall*

Probability	Dates for given probability and temperature		
	24° F. or lower	28° F. or lower	32° F. or lower
Spring:			
1 year in 10 later than	Apr. 10	Apr. 28	May 7
2 years in 10 later than	Apr. 4	Apr. 23	May 2
5 years in 10 later than	Mar. 23	Apr. 12	Apr. 22
Fall:			
1 year in 10 earlier than	Oct. 15	Oct. 12	Oct. 3
2 years in 10 earlier than	Oct. 20	Oct. 17	Oct. 8
5 years in 10 earlier than	Oct. 31	Oct. 26	Oct. 18

in fall, is about 183 days. Table 7 shows the risk of freezing temperatures. Critical temperatures are different for different crops, so dates are given for threshold temperatures of 24°, 28°, and 32° F.

Table 8 shows the probability of very high or very low temperatures. For example, as shown in this table, an average of 2 years in 10 will have at least 4 days in July (not necessarily 4 consecutive days) when the temperature is 99° F. or higher. At the other extreme, 2 years in 10 will have at least 4 days in January (not necessarily consecutive) when the temperature is 5° or lower.

A daily freeze-thaw cycle is normal in cold weather. The temperature drops to freezing or below on about 90 nights in an average winter, but it generally rises above freezing during the day.

Metcalfe County has an average annual precipitation of about 48 inches. Measurable precipitation is recorded on about 122 days during an average year, but in some years the amounts are inadequate and in others excessive. The probabilities of very small or very large amounts of precipitation are shown in table 8. The table shows, for example, that in 1 year in 10 June will have less than 1.75 inches, and in 1 year in 10 March will have more than 8.21 inches.

During an ordinary year, the heaviest 1-hour precipitation is about 1.2 inches. There is a 30 percent chance that this will occur in July, but less than a 1 percent chance that it will occur in December, January, or February. Once in 10 years a 24-hour total of 4.7 inches can be expected. There is about a 2 percent chance that this will occur in July, and less than a 2 percent chance it will occur in any other month.

Thunderstorms occur on an average of about 50 days a year. They are most frequent from March through August but may occur in any month. Most of the short, high-intensity rains, which are most likely in summer, occur during thunderstorms. Less intense rains lasting for several days sometimes occur late in spring and cause tillage to be delayed. These prolonged rains are the ones most apt to cause local flooding, because they occur when the soils are frozen, snow covered, or saturated. Long periods of mild, sunny weather are typical of the fall harvest season.

Geology

Metcalfe County lies within the Eastern Pennyroyal physiographic region, which is part of the Mississippian Plateau (4). The county is underlain by sedimentary

TABLE 8.—*Temperature and precipitation*

[Data from Edmonton and Greensburg]

Month	Temperature				Precipitation				
	Average daily maximum [1]	Average daily minimum [1]	2 years in 10 will have at least 4 days with [1]—		Average monthly total [2]	1 year in 10 will have—		Average days with snow cover [1]	Average depth of snow on days with snow cover [1]
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than [3]—	More than [3]—		
	°F.	°F.	°F.	°F.	Inches	Inches	Inches	Number	Inches
January	47.3	26.6	66	5	5.86	1.7	10.9	5	2.3
February	50.0	27.7	67	10	4.33	1.5	8.0	4	1.5
March	58.2	33.7	76	18	5.17	2.6	8.5	2	3.6
April	69.9	43.4	84	29	3.85	2.1	5.9	0	0
May	78.7	52.3	90	38	3.76	1.8	7.5	0	0
June	86.8	61.5	97	50	4.26	1.8	7.7	0	0
July	89.9	65.0	99	54	4.04	2.0	7.4	0	0
August	88.7	63.5	97	51	3.17	1.5	6.1	0	0
September	83.4	56.0	95	42	3.09	1.1	5.8	0	0
October	72.5	43.6	86	29	2.33	.9	4.1	0	0
November	58.4	33.2	75	19	3.69	1.4	7.3	1	1.8
December	48.4	27.6	64	11	4.12	1.8	7.3	2	1.9

[1] Based on records at Greensburg for the period 1931 to 1960.
[2] From records kept at Edmonton and Greensburg.
[3] Estimated from records at Edmonton and Greensburg.

rock of Mississippian and Devonian age. A mantle of wind-deposited silt up to 25 inches thick covers the uplands throughout the county.

Chattanooga shale of the Devonian period is exposed in the southeastern part of the county, along Marrowbone Creek and Ferris Fork Creek. Resting upon the Chattanooga shale is the lowest formation of Mississippian age, the gray, clayey Waverly shale, which ranges from a few feet to several feet in thickness. The Fort Payne formation, approximately 200 feet thick and consisting of cherty limestone, siltstone, shale, and sandstone, is above the Waverly shale. The Warsaw formation, approximately 100 feet thick in places and consisting of limestone, thin-bedded sandstone, and shale, is immediately above the Fort Payne formation. Cherty limestone of the St. Louis formation occurs on the higher ridgetops. This formation is most extensive in the northwestern part of the county.

Relief and Drainage

Metcalfe County is a dissected plateau. The northeastern part is rolling and has a karst topography; that is, it is characterized by sinkholes and depressions. The eastern part is characterized by deep, narrow valleys with steep side walls and narrow or moderately broad ridgetops. The county is traversed from the southeast to the north by the Little Barren River and its tributaries.

The relief of the county ranges from level to steep. In the most dissected areas, the elevation of the ridges ranges from 600 feet to 1,149 feet. The lowest point is near the confluence of East Fork and South Fork of the Little Barren River. The highest point is in the southern part of the county, just north of the intersection of State Highways 163 and 90. Edmonton, the county seat, is 843 feet above sea level.

Surface drainage predominates in approximately 90 percent of the county, but subterranean drainage predominates in areas of karst topography.

In the karst areas, water accumulates in the depressions after heavy rains. These depressions are drained by natural outlets, or connecting tunnels, to surface streams at lower elevations. These natural outlets, commonly called sinkholes, are as much as 25 feet across. Occasionally, they become clogged with crop residue, debris, and soil that has been deposited by runoff. At such times water stands in depressions for considerable periods before it filters down into the underground streams, and consequently these areas are unsuitable for cultivated crops. If the outlet is sealed tightly enough, the depression fills with water permanently and can be used as a stockwater pond.

The channels of the South Fork and East Fork of the Little Barren River have gradually silted up, and intermittent gravel and sand bars have formed. As a result, the channel capacity is no longer adequate for the volume of runoff water that follows a heavy rain. Even a slight rise in the water level will cause the streams to overflow their banks and spread water over the flood plains. In places the river is cutting a new and deeper channel, and in other places its banks are receding and leaving standing water in sloughs and low areas.

The southeastern part of the county, predominantly a wooded area, is drained by the headwaters and tributaries of Marrowbone Creek. The southern and southwestern parts of the county are drained by several creeks and other streams.

Agriculture

In 1959 about 76 percent of the land area of Metcalfe County, or 144,964 acres, was in farms, and 84,929 acres of this was cropland. Of this acreage, 35,431 acres was harvested, 39,249 acres was used only for pasture, and 10,249 acres was neither harvested nor used for pasture. In this same year, 43,473 acres was in woodland, of which 12,951 acres was used for pasture.

In 1959 the average size of farms was 93.8 acres, but there was considerable variation in size, as follows:

Acres	*Number of farms*
Less than 10	114
10 to 49	425
50 to 69	212
70 to 99	249
100 to 139	226
140 to 179	123
180 to 219	78
220 to 259	41
260 to 499	66
500 to 990	11

Farm enterprises are diversified, and in part the farm products are used on the farm. In 1959 the numbers of farms, by type, were as follows:

Type of farm	*Number of farms*
Tobacco	715
Poultry	15
Dairy	100
Livestock	95
General	165
Miscellaneous	455

Corn, the most important feed crop, is grown on nearly all of the farms. Hay crops, mainly lespedeza, mixed grasses, clover, and some small grain, are grown on most farms. The acreage of alfalfa is increasing. The 704 acres used for this crop in 1954 had increased to 1,681 acres in 1959. Small grain is grown for feed on many farms, but the total acreage is small. Burley tobacco, the most important cash crop, is grown on nearly every farm. The acreage of the principal crops in 1954 and in 1959 is shown in table 9.

TABLE 9.—*Acreage of principal crops in stated years*

Crop	1954	1959
	Acres	*Acres*
Corn	18,890	14,921
Tobacco	3,297	2,299
Wheat	599	244
Oats	1,001	333
Barley	137	122
Hay crops:		
Alfalfa and alfalfa mixtures	704	1,681
Clover, timothy, and clover-grass mixtures	2,390	3,853
Lespedeza	6,549	9,156
Small grain	3,172	881
Other hay	3,383	834
Field seed crops (red clover, lespedeza, Kentucky 31 fescue, and orchardgrass)	66	517

TABLE 10.—*Livestock on farms in stated years*

Livestock	1954	1959
Cattle and calves	12, 459	16, 412
Horses and mules	2, 110	1, 488
Hogs and pigs	5, 559	8, 414
Sheep and lambs	513	331
Chickens	80, 915	58, 828

The number of cattle and hogs on farms in the county increased between 1954 and 1959, but the number of chickens decreased slightly. The numbers of livestock and poultry in 1954 and in 1959 are shown in table 10.

Industry and Transportation

Metcalfe County is predominantly rural. Farming is the main enterprise, and in 1954 farms provided more than 1,300 jobs. A clothing factory employs 150 to 200 people, mainly women. One sawmill is operated full time, and several are operated part time. A large quarry produces limestone used in road building and in other construction. It also produces agricultural lime used by farmers in this and nearby counties.

The county is served by trucklines that carry goods over Federal, State, and county roads. All of the county roads are either blacktopped or gravelled. There are only a few isolated areas that are not accessible by road throughout the year.

There are a few active oil wells in the county. Since 1960 an average of 28,447 barrels of oil has been produced each month.

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Glossary

Acidity. See Reaction, soil.

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

Available water capacity. The difference between the amount of water in a soil at field capacity and the amount in the same soil at the permanent wilting point. Commonly expressed as inches of water per inch of soil.

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

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

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

Loose.—Noncoherent; will not hold together in a mass.

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

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

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

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

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

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

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

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

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

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

Karst (topography). Marked by sinks (karst holes) interspersed with abrupt ridges and irregular protuberant rocks, and by caverns and underground streams.

Moisture-supplying capacity. The capacity of the soil to take in moisture and supply it to plants. It depends on runoff, rate of infiltration, water-holding capacity, and depth of root zone. Relative levels of moisture-supplying capacity are expressed as high, moderately high, moderately low, low, or very low.

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

meters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse*, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Natural drainage. Moisture conditions that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural drainage are recognized.

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

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

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

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

Imperfectly or *somewhat poorly drained* soils are wet for significant periods but not all the time. If podzolic, they commonly are mottled in the lower part of the A horizon and in the B and C horizons, below a depth of 6 to 16 inches.

Poorly drained soils are wet for long periods; they are light gray and generally are mottled from the surface downward, but some are unmottled or nearly so.

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

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are expressed in inches per hour, as follows:

Slow	Less than 0.2.
Moderately slow	0.2 to 0.63.
Moderate	0.63 to 2.0.
Moderately rapid	2.0 to 6.3.
Rapid	More than 6.3.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

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

Residuum. Unconsolidated, partly weathered mineral material that accumulates over disintegrating solid rock. Residuum is not soil but is frequently the material in which a soil has formed.

Root zone. The part of the soil that is penetrated or can be penetrated by plant roots. The content of clay in the soil and the depth to the water table, the fragipan, or bedrock are features that affect the depth of the root zone. The terms used in this report to describe the depth of the root zone are as follows:

Very shallow	Less than 10 inches.
Shallow	10 to 20 inches.
Moderately deep	20 to 36 inches.
Deep	36 inches or more.

Sand. As a soil separate, individual rock or mineral fragments ranging from 0.05 to 2.0 millimeters in diameter. Most sand grains consist of quartz, but sand may be any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

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

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

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

U.S. GOVERNMENT PRINTING OFFICE: 1967

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