SOIL SURVEY OF

Scott County, Kentucky

United States Department of Agriculture
Soil Conservation Service
In cooperation with
Kentucky Agricultural Experiment Station

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all who need the information, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1972-73. Soil names and descriptions were approved in 1974. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1974. This survey was made cooperatively by the Soil Conservation Service and the Kentucky Agricultural Experiment Station. It is part of the technical assistance furnished to the Scott County Conservation District.

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

HOW TO USE THIS SOIL SURVEY

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

Locating Soils

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

On each sheet of the detailed map, soil areas are outlined and 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. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described.

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

Foresters and others can refer to the section "Woodland," where information about using the soils of the county for trees is given.

Wildlife managers and others can find information about soils and wildlife in the section "Wildlife Habitat."

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

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

Scientists and others can read about the soils in the section "Formation, Morphology, and Classification of the Soils."

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

Cover: Lowell silt loam, 2 to 6 percent slopes, is well suited to tobacco.

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Issued July, 1977

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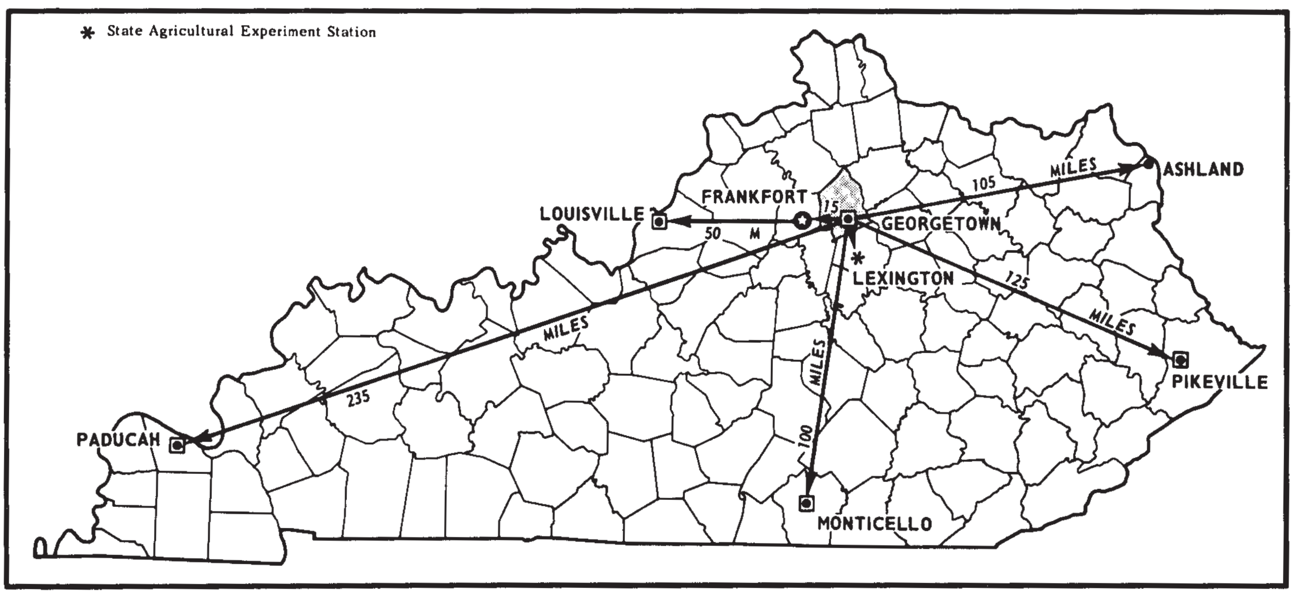

Location of Scott County in Kentucky.

SOIL SURVEY OF SCOTT COUNTY, KENTUCKY

BY BILLY C. WEISENBERGER AND DAN ISGRIG, SOIL CONSERVATION SERVICE

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

SCOTT COUNTY is in the north-central part of Kentucky and has an area of approximately 284 square miles, or 181,820 acres. Georgetown, the county seat, is about 12 miles north of Lexington, a rapidly expanding city 18 miles east of the State capital at Frankfort, 70 miles south of Cincinnati, and 70 miles east of Louisville.

The southern part of Scott County is in the Inner Bluegrass Region of Kentucky. The soils there are fertile and well suited to many kinds of crops. The farms have numerous, tree-shaded pastures. The northern part of the county is in the Hills of the Bluegrass Region. The soils there are clayey and so steep that they are better suited to pasture than to row crops. The landscape is hilly and has narrow, winding ridges and V-shaped valleys.

The climate is humid-temperate and favorable for many kinds of plants and animals. Farming has been important in Scott County since it was first settled. Tobacco is the main cash crop. Livestock is also important.

The recent growth of industry and population has been rapid in the southern part of the county. Much of this part of the county is being used for urban development. The population has decreased in the northern part of the county.

How This Survey Was Made

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

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have a profile 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 geographic feature near the place where a soil of that series was first observed and mapped. Maury and Lowell, 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 undisturbed landscape.

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

In some counties the soil scientists find a soil that has properties sufficiently different from other known soils to suggest establishing a new soil series. If the soil has such a limited acreage that establishing a new series is not justified, it is given the name of a similar series and called a variant. The Dunning variant is an example.

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 roads, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

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

Some mapping units are made up of soils of different series or of different phases within one series. Two such kinds of mapping units—soil complexes and undifferentiated groups—are shown on the soil map of Scott County.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Lowell-Nolin silt loams, 2 to 10 percent slopes, is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Eden and Faywood silty clay loams, 2 to 12 percent slopes, is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names, such as "Rock outcrop," which is a land type in Scott County.

While a soil is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil 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 soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland and rangeland, and engineers.

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 the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in the survey area. A soil association is a landscape that has a distinctive pattern of soils in defined proportions. It typically consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in an association can occur in other associations, but in different patterns.

A map showing soil associations is useful to people who want to have a general idea of the soils in a survey area, who want to compare different parts of that area, or who want to locate large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide for broad planning on a watershed, a wooded tract, or a wildlife area or for broad planning of recreation facilities, community developments, and such engineering works as transportation corridors. It is not a suitable map for detailed planning for management of a farm or field or for selecting the exact location of a road or building or other structure, because the soils within an association ordinarily vary in slope, depth, stoniness, drainage, and other characteristics that affect their management.

All soil boundaries on the general soil map of Scott County join with those of Fayette, Harrison, and Owen Counties except for one soil area adjoining Harrison County. In this area, differences in mapping are caused by a change in the concept of some soil series.

The soil associations in Scott County are described in the following pages.

1. Eden Association

Moderately steep to steep, well drained soils that have a clayey subsoil; on narrow ridges and hillsides

This association is a hilly or highly dissected area that has steep hillsides, narrow winding ridgetops, and V-shaped valleys. It is a part of the Hills of the Bluegrass Region of Kentucky. The soils are underlain by soft calcareous shale that has thin layers of limestone and beds of siltstone (fig. 1).

This association makes up about 48 percent of the county. It is about 87 percent Eden soils and 13 percent soils of minor extent.

Eden soils are moderately deep and well drained. They are somewhat droughty because the subsoil is clayey and contains coarse fragments of limestone and shale. Runoff is rapid, and permeability is slow.

Among the soils of minor extent are Cynthiana soils and Rock outcrop on very steep hillsides bordering the larger streams; Lowell soils on footslopes; Lowell and Faywood soils on a few ridgetops; and Nolin and Newark soils on narrow flood plains.

About two-thirds of the soils in this association are used for hay or pasture. The rest is mostly in trees or brush because mowing to control weeds is difficult on these soils. Some houses and farms are abandoned. Most soils are too steep for row crops, and very little of the acreage is plowed, except for small gardens and tobacco. Tobacco is mostly grown on Lowell soils in narrow valleys. The potential for range-type grazing is good, wood crops can be greatly increased, and the potential for wildlife is fair. The limitations for urban development are severe in most of the soils.

2. Lowell-Nicholson Association

Gently sloping to sloping, well drained and moderately well drained soils that have a loamy and clayey subsoil; on broad ridges

This association consists of broad, gently sloping ridges, sloping side slopes, and narrow flood plains. It borders the Hills of the Bluegrass Region, and the Inner Bluegrass Region of Kentucky. The soils are underlain by limestone and calcareous shale (fig. 2).

This association makes up about 25 percent of the county. It is about 80 percent Lowell soils, 8 percent Nicholson soils, and 12 percent soils of minor extent.

Lowell soils are deep and well drained. The upper part of the subsoil is thin and loamy and the lower part is

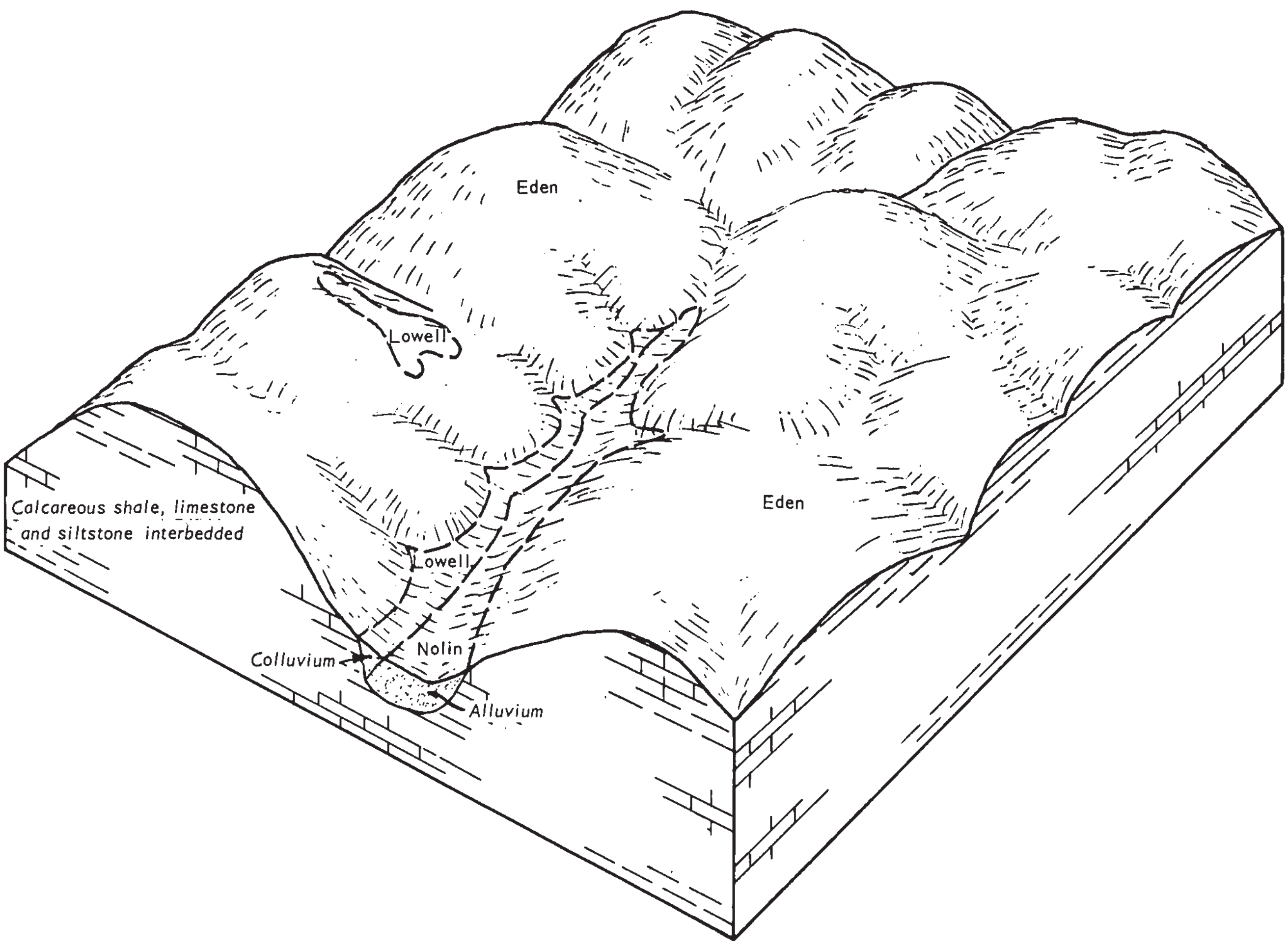

***Figure 1.*—Pattern of soils and underlying material in the Eden association.**

clayey. Runoff is medium, and permeability is moderately slow.

Nicholson soils are in flatter areas on ridges and in second bottoms. They are deep and moderately well drained. The upper part of the subsoil is loamy, and the lower part is a fragipan. Runoff is medium, and permeability is slow through the fragipan.

Among the soils of minor extent are Faywood and Cynthiana soils on steeper hillsides and Nolin, Huntington, and Newark soils on flood plains.

Most of this association is in farms. Much of the acreage is in grass, but many soils are used for corn and tobacco. If properly managed the soils in this association are suited to general farming. The soils have some limitations for urban development. A few areas are used for housing.

3. Maury-McAfee Association

Gently sloping to moderately steep, well drained soils that have a loamy and clayey subsoil, on broad gentle ridges and moderately steep areas

This association consists of broad, gently sloping ridges and narrow, steeper areas around sinkholes and drainageways. It is part of the Inner Bluegrass Region of Kentucky. The soils are underlain mostly by limestone (fig. 3).

This association makes up about 27 percent of the county. It is about 57 percent Maury soils, 22 percent McAfee soils, and 21 percent soils of minor extent.

Maury soils are highly fertile. They are deep and well drained. The upper part of the subsoil is thin and loamy, and the lower part is clayey. Runoff is medium, and permeability is moderate. McAfee soils are mainly in the steeper areas. These soils are moderately deep and well drained. The upper part of the subsoil is also thin and loamy, and the lower part is clayey. Runoff is rapid, and permeability is moderately slow.

Among the soils of minor extent are Huntington, Dunning, and Newark soils on flood plains; Cynthiana soils in steep areas near North Elkhorn Creek and South Elkhorn Creek; and Ashton soils on low stream terraces.

Distinguishing characteristics of this association include high-phosphate soils and bluegrass pastures (fig. 4). This area of soils is noted for its tobacco, thorough-

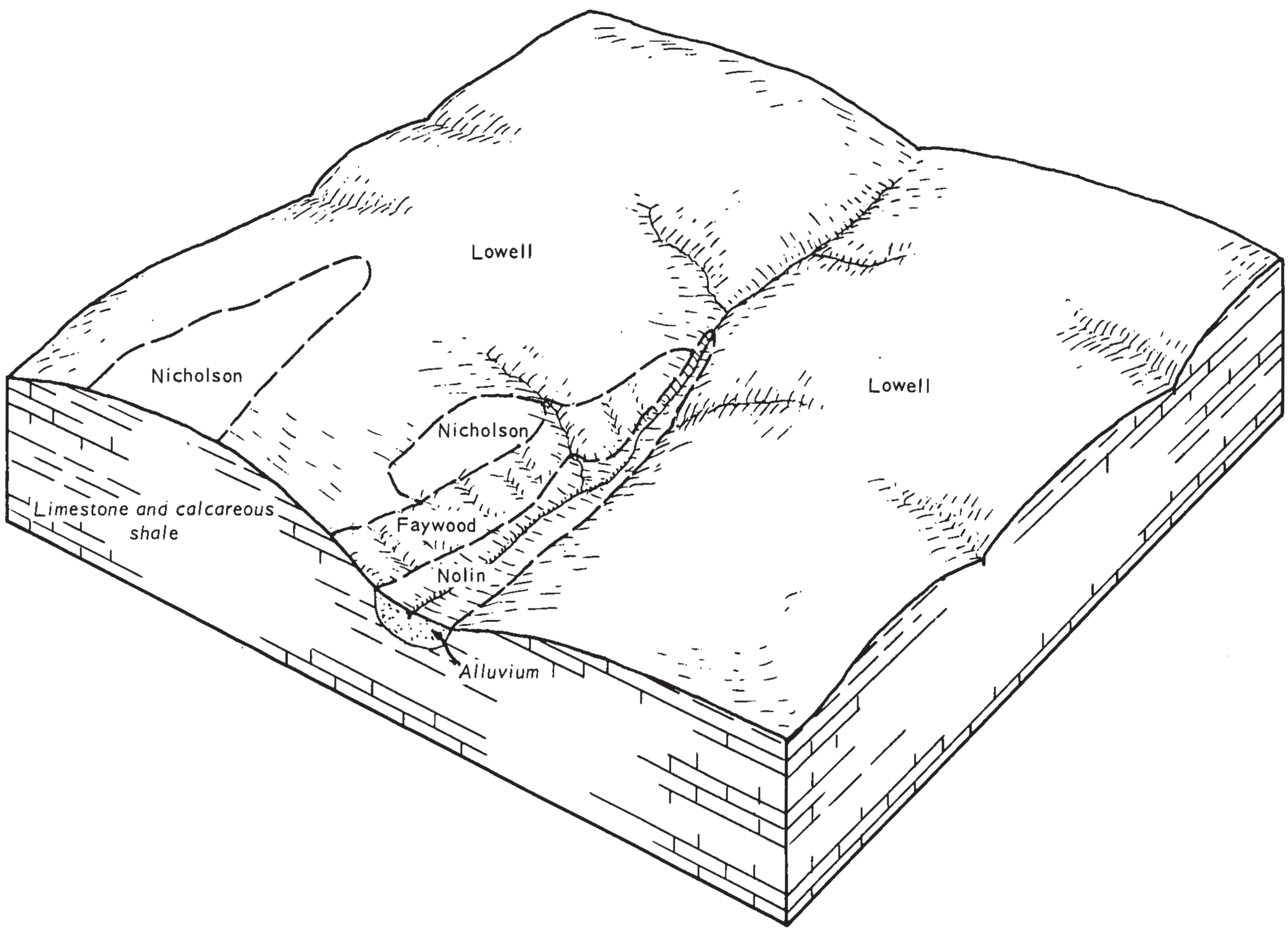

***Figure 2.*—Pattern of soils and underlying material in the Lowell-Nicholson association.**

bred horses, and pure-bred cattle. Many of the soils have few limitations, other than slope, for farming or urban use. Depth to bedrock is a limitation of some of the soils. A large part of this association is used as sites for houses and factories.

Descriptions of the Soils

In this section the soils of Scott County are described in detail and their use and management are discussed. Each soil series is described in detail, and then, briefly, the mapping units in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

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

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Rock outcrop, for example, does not belong to a soil series, but nevertheless, is listed in alphabetic order along with the soil series.

Preceding the name of each mapping unit is a symbol that identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability in which the mapping unit has been placed.

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary, and more

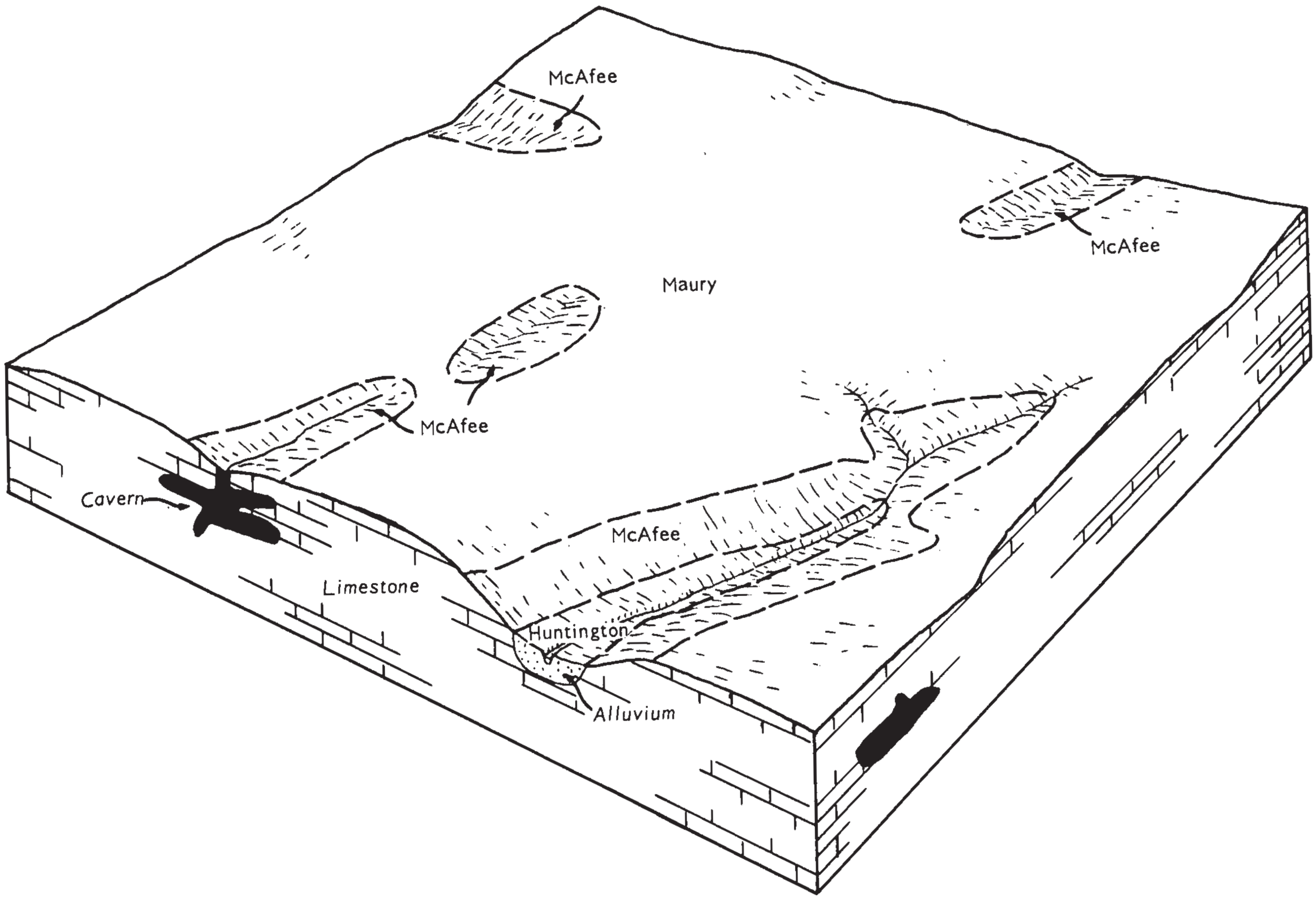

***Figure 3.*—Pattern of soils and underlying material in the Maury-McAfee association.**

detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*11*).[1]

Scott County borders the following counties for which soil surveys have been completed: Fayette, Harrison, Carroll, Gallatin, and Owen Counties.

All soil boundaries in Scott County do not join with those in Fayette County. In several places the soils do not join because of a change in the concept of some soil series during the last several years, and some soils were not mapped in both counties but were included in mapping with more extensive soils. Almost all soil boundaries in Scott County join those of Owen County. In two areas the soils do not join because of a difference in the design of mapping units, but interpretations for these areas of soils are the same.

The soil boundaries and soils do not join with those in Harrison County in several areas because of a change in the concept of some soil series and because of a difference in the design of mapping units. Although the soils do not join in several places, interpretations for these areas of soils are basically the same.

[1] Italic numbers in parentheses refer to Literature Cited, p. 49.

Ashton Series

The Ashton series consists of deep, well drained soils. These soils formed in alluvium that derived mainly from limestone and calcareous shale. They are nearly level and gently sloping. The soils are on low stream terraces, or second bottoms, in scattered small areas mainly along the major streams.

In a representative profile the surface layer is dark brown silt loam 9 inches thick. In the upper 31 inches the subsoil is brown, friable silt loam, and in the lower 12 inches it is brown, friable light silty clay loam. The underlying material is brown silt loam. It extends below a depth of 60 inches.

These soils have a deep root zone. Permeability is moderate, and runoff is slow. The available water capacity is high, and the organic-matter content is moderate. The soils are medium acid to neutral throughout. Natural fertility is high.

These soils are well suited to cultivated crops. They are used mainly for tobacco, corn, or hay, but some soils are used for pasture. The surface layer is easy to till. The soils are flooded during unusually high floods, but crops are seldom affected by overflow.

***Figure 4.*—Pasture on Maury silt loam.**

TABLE 1.—*Acreage and extent of the soils*

Soil	Acres	Percent
Ashton silt loam, 0 to 4 percent slopes	925	0.5
Cynthiana rocky silty clay loam, 12 to 20 percent slopes	375	.2
Cynthiana-Rock outcrop complex, 20 to 50 percent slopes	2,310	1.3
Dunning silty clay loam, dark subsoil variant	470	.3
Eden silty clay loam, 12 to 20 percent slopes	38,225	21.1
Eden flaggy silty clay, 20 to 30 percent slopes, severely eroded	38,795	21.4
Eden and Faywood silty clay loams, 2 to 12 percent slopes	795	.4
Huntington silt loam	9,055	5.0
Lowell silt loam, 2 to 6 percent slopes	15,205	8.4
Lowell silt loam, 6 to 12 percent slopes	20,570	11.3
Lowell-Nolin silt loams, 2 to 10 percent slopes	6,945	3.8
Maury silt loam, 2 to 6 percent slopes	24,780	13.6
Maury silt loam, 6 to 12 percent slopes	2,605	1.4
McAfee silt loam, 6 to 12 percent slopes	9,405	5.2
McAfee silt loam, 12 to 20 percent slopes	1,190	.6
Newark silt loam	595	.3
Nicholson silt loam, 2 to 6 percent slopes	3,640	2.0
Nolin silt loam	5,175	2.8
Water	[1] 760	.4
Total	181,820	100.0

[1] Bodies of water 1 to 40 acres in size.

Representative profile of Ashton silt loam, 0 to 4 percent slopes, about 80 feet south of a point on State Highway 1689 that is 300 feet east of a barn and 0.7 mile west of U.S. Highway 227; 9.0 miles west-northwest of Georgetown and 1.1 miles west of Stamping Ground.

Ap—0 to 9 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; many roots; slightly acid; clear smooth boundary.

B1—9 to 20 inches; brown (7.5YR 4/4) silt loam; weak fine granular and weak fine subangular blocky structure; friable; common roots; few small concretions; slightly acid; gradual smooth boundary.

B21t—20 to 40 inches; brown (7.5YR 4/4) heavy silt loam; weak medium subangular blocky structure; friable; few fine roots; few clay films; few small dark concretions; neutral; gradual smooth boundary.

B22t—40 to 52 inches; brown (7.5YR 4/4) light silty clay loam; weak medium subangular blocky structure; friable; few clay films; common small concretions; slightly acid; gradual smooth boundary.

C—52 to 60 inches; brown (7.5YR 5/4) heavy silt loam; massive; friable; 5 percent coarse fragments of chert and limestone; many small black concretions; slightly acid.

The solum is 40 to 60 inches thick. It is medium acid to neutral throughout. Depth to bedrock ranges from 4 to more than 10 feet.

The Ap horizon is dark brown (10YR 3/3, 7.5YR 3/2) or very dark grayish brown (10YR 3/2). Its structure is weak or moderate.

The B1 horizon is brown (7.5YR 4/4, 10YR 4/3) or dark yellowish brown (10YR 4/4). The B2 horizon is brown (7.5YR 4/4), reddish brown (5YR 4/4), or dark yellowish brown (10YR 4/4) heavy silt loam or light silty clay loam. Its structure is weak or moderate, fine or medium.

The C horizon is brown (7.5YR 4/4 or 5/4) or dark yellowish brown (10YR 4/4) silt loam or silty clay loam. It is 0 to 10 percent coarse fragments. There are few, fine, distinct, light brownish gray mottles in places.

Ashton soils are on low stream terraces in slightly higher positions than Huntington and Nolin soils. They are in lower areas than Maury and McAfee soils, and they contain less clay in the lower part of the subsoil than those soils. Ashton soils have a thinner, dark-colored surface layer than Huntington soils and a darker colored surface layer than Nolin soils, and they flood less than those soils.

AsA—Ashton silt loam, 0 to 4 percent slopes. This soil is on low stream terraces or second bottoms. The areas are 5 to 30 acres in size.

Included with this soil in mapping are small areas of soils where the upper part of the subsoil is dark brown or dark grayish brown silt loam, soils where the subsoil is heavy silty clay loam, and soils where the surface layer is dark brown and more than 10 inches thick.

This Ashton soil is well suited to all row crops and pasture and hay plants commonly grown in the county. It is also well suited to truck crops, orchards, vineyards, and nursery stock plants.

Erosion is not a hazard, and this soil is suited to continuous cultivation. Proper fertilization, maintenance of organic matter, and good tillage practices are needed to keep the soil productive. Capability unit I-2.

Cynthiana Series

The Cynthiana series consists of shallow, well drained to somewhat excessively drained soils. These soils formed in residual material that weathered from limestone interbedded with thin layers of calcareous shale. The soils are moderately steep to very steep and mainly on hillsides bordering the major stream valleys.

In a representative profile the surface layer is dark grayish brown silty clay loam about 5 inches thick. The subsoil is yellowish brown, firm silty clay 13 inches thick. Limestone interbedded with thin layers of shale is at a depth of about 18 inches.

These soils have a shallow root zone. Permeability is moderately slow, and runoff is rapid. The available water capacity is low, and the organic-matter content is moderate. The surface layer ranges from slightly acid to neutral, and the subsoil ranges from slightly acid to mildly alkaline. Natural fertility is medium.

These soils are suited to limited pasture. They are mostly in second-growth deciduous trees, but some soils have been cleared and are used for pasture.

Representative profile of Cynthiana silty clay loam, in an area of Cynthiana-Rock outcrop complex, 20 to 50 percent slopes, about 150 feet south of State Highway 32 and 120 feet east of U.S. Highway 25; 12 miles north of Georgetown and 0.5 mile east of Interstate 75.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) heavy silty clay loam; weak fine granular and subangular blocky structure; friable; common roots; 5 percent coarse fragments of limestone; neutral; clear smooth boundary.

Bt—5 to 18 inches; yellowish brown (10YR 5/4) silty clay; moderate fine angular blocky structure; firm, sticky and plastic; few roots; few dark yellowish brown (10YR 4/4) clay films; 10 percent coarse fragments; neutral; abrupt wavy boundary.

R—18 inches; limestone interbedded with thin layers of soft calcareous shale.

The solum is 10 to 20 inches thick. Coarse fragments, mostly limestone, make up 5 to 30 percent of the A horizon and 10 to 30 percent of the B horizon. The Ap horizon ranges from slightly acid to neutral and the B horizon ranges from slightly acid to mildly alkaline. Depth to bedrock ranges from 10 to 20 inches.

The Ap horizon is dark grayish brown (10YR 4/2), brown (10YR 4/3), or dark brown (10YR 3/3) silt loam or silty clay loam. Its structure is weak or moderate, fine, granular or subangular blocky.

The B horizon is yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/4), olive brown (2.5Y 4/4), or light olive brown (2.5Y 5/4 or 5/6) silty clay or clay. It is mottled with pale brown or light yellowish brown in places. Its structure is very fine to medium.

In places there is a 3- to 6-inch C horizon that is similar in color and texture to the B horizon.

Cynthiana soils are near the Eden and McAfee soils on hillsides. They are shallower to bedrock than either of those soils.

ChD—Cynthiana rocky silty clay loam, 12 to 20 percent slopes. This soil is mainly in long, narrow areas bordering stream valleys. The areas are 5 to 25 acres in size.

Included with this soil in mapping are small areas of soils that have a very dark grayish brown surface layer, soils that have a silt loam surface layer, and soils that are less than 10 inches deep to bedrock. Also included are a few small areas of Faywood, Eden, and McAfee soils.

This Cynthiana soil is suited to pasture, but it generally is not suited to cultivated crops. Suitable pasture plants include Kentucky bluegrass, tall fescue, and sericea lespedeza. Establishing a stand of grass is difficult because of the moderately steep slopes, the stones and rocks on the surface, the droughtiness, and the hazard of erosion. Capability unit VIs-1.

CyF—Cynthiana-Rock outcrop complex, 20 to 50 percent slopes. This mapping unit is mostly on steep bluffs and hillsides near the major streams. The areas are 30 to 100 acres in size. The Cynthiana soil has the profile described as representative of the series. This mapping unit is about 40 percent Cynthiana rocky silty clay loam, 25 percent Rock outcrop, 20 percent soils less than 10 inches thick, and 15 percent other soils.

Included in mapping are small areas of soils that are 6 to 10 inches deep to bedrock, soils that have a very dark grayish brown surface layer, soils that have a thin silt loam surface layer, and Faywood and McAfee soils. Also included are areas of soils that have a brown or strong brown subsoil, very narrow areas of soils that have a thick dark brown surface layer, and a few areas of soils that have a cherty or gravelly surface layer.

The soils are suited to limited pasture or woodland. Suitable pasture plants are Kentucky bluegrass, tall fescue, and sericea lespedeza. Establishing a stand of grass is difficult because of the steep and very steep slopes and Rock outcrop. Capability unit VIIs-1.

Dunning Variant

The Dunning variant consists of deep, poorly drained soils that formed in old, slack water alluvium derived from limestone. These soils are nearly level on flood plains in the southern part of the county.

In a representative profile the surface layer is very dark grayish brown silty clay loam about 16 inches thick. In the upper 14 inches the subsoil is very dark gray, firm silty clay and has olive brown mottles; in the lower 10 inches it is dark gray, very firm silty clay and has olive brown mottles. The underlying material is 14 inches thick. It is dark gray silty clay and has brown and light brownish gray mottles. Limestone bedrock is at a depth of about 54 inches.

The clayey subsoil impedes root penetration and the movement of air and water. Permeability is slow, and runoff is very slow. The available water capacity is high, and the organic-matter content is high. The soils are slightly acid to mildly alkaline throughout. Natural fertility is high. The surface layer is difficult to till, and clods form if the moisture content is too high.

If adequately drained, these soils are well suited to corn. These soils are mostly in pasture, but a few areas are in corn. The soils often flood during winter, and crops are sometimes damaged during the growing season.

Representative profile of Dunning silty clay loam, dark subsoil variant, about 200 feet east of U.S. Highway 25 and 300 feet north of the Fayette and Scott County line; 3.6 miles south of Georgetown.

A1—0 to 16 inches; very dark grayish brown (10YR 3/2) silty clay loam; moderate fine granular structure; friable; many roots; slightly acid; clear smooth boundary.

B1g—16 to 30 inches; very dark gray (10YR 3/1) silty clay; few fine distinct olive brown (2.5Y 4/4) mottles; weak very fine and fine angular blocky structure; firm, sticky and plastic; few roots; many small black concretions; neutral; gradual smooth boundary.

B2g—30 to 40 inches; dark gray (10YR 4/1) silty clay; common fine distinct olive brown (2.5YR 4/4) mottles; moderate medium angular blocky structure parting to weak very fine and fine angular blocky, very firm, sticky and plastic; few roots; many small brown concretions; neutral; gradual smooth boundary.

Cg—40 to 54 inches; dark gray (10YR 4/1) silty clay; common medium distinct brown (7.5YR 4/4) and light brownish gray (10YR 6/2) mottles; massive; firm, sticky and plastic; many small black and brown concretions; neutral; abrupt wavy boundary.

R—54 inches; limestone bedrock.

The solum is 30 to 50 inches thick. Reaction is slightly acid to mildly alkaline throughout. Depth to bedrock is more than 40 inches.

The A horizon is very dark grayish brown (10YR 3/2) or very dark gray (10YR 3/1).

The B1g horizon is very dark gray (10YR 3/1) or very dark grayish brown (10YR 3/2) heavy silty clay loam or silty clay. The B2g horizon is dominantly dark gray (10YR 4/1, 5Y 4/1) or gray (10YR 5/1) and is silty clay or clay.

The C horizon is 0 to 5 percent coarse fragments.

These Dunning soils are on first bottoms with Huntington soils, and they are in similar positions as Newark soils. They are less well drained than Huntington soils, and they are darker colored in the upper horizons and finer textured throughout the profile than Newark soils.

Du—Dunning silty clay loam, dark subsoil variant. This is a nearly level soil on flood plains. Slopes are 0 to 2 percent. The few, but fairly large, areas of this soil are in the southern part of the county.

Included with this soil in mapping are small areas of moderately well drained soils that have a dark brown surface layer and small areas of soils that have a silt loam surface layer.

If adequately drained, this Dunning soil is suited to row crops, such as corn, soybeans, and small grain, and to tall fescue, orchardgrass, Kentucky bluegrass, Ladino clover, red clover, and annual lespedeza. It is generally not suited to tobacco.

Wetness is the main limitation, but it can be reduced by artificial drainage. Crops are damaged by floods at times. Capability unit IIIw-1.

Eden Series

The Eden series consists of moderately deep, well drained, somewhat droughty soils. These soils formed in residual material that weathered from soft calcareous shale interbedded with thin layers of limestone and some siltstone (fig. 5). The soils are in the northern part of the county. Those on narrow ridges are moderately steep, and those on side slopes are steep. Some on broad ridges are gently sloping to sloping.

In a representative profile the surface layer is grayish brown silty clay loam about 5 inches thick. The subsoil is light olive brown firm silty clay about 21 inches thick. The underlying material is olive brown clay or soft shale and has thin layers of limestone and siltstone. It extends to a depth of 38 inches or more.

These soils have a moderately deep root zone. Root penetration is impeded by coarse fragments in the surface layer and by the clayey subsoil. Permeability is slow, and runoff is rapid. The available water capacity is moderate to low, and the organic-matter content is low. The soils are slightly acid to moderately alkaline throughout. They are medium to high in content of potash, low to medium in phosphate, and generally low in nitrogen.

These soils are suited to pasture if they are properly managed. They were cleared of hardwood trees and used for corn for many years, but now very little corn is grown. The soils that have the least slope are used mostly for pasture and hay; the steeper soils have reverted mainly to redcedar, deciduous trees, or bushy pasture. Soils in some very small areas are used for burley tobacco and garden crops.

Representative profile of Eden silty clay loam, 12 to 20 percent slopes, about 150 feet southeast of a point on

***Figure 5.*—Shale, limestone, and siltstone underlying Eden soils.**

a private road that is 320 feet east-northeast of an old homesite and 3 miles on farm road north of State Highway 620; 8.7 miles north of Georgetown and 0.9 mile east of Interstate 75.

Ap—0 to 5 inches; grayish brown (2.5Y 5/2) silty clay loam; flagstones cover 3 percent of the surface; weak medium subangular blocky and weak fine and medium granular structure; friable; many small roots; few small pores; few very small black concretions; slightly acid; clear smooth boundary.

B2t—5 to 19 inches; light olive brown (2.5Y 5/4) silty clay; few fine faint yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure; firm, sticky and plastic; few small roots; few small pores; common clay films; 10 percent fragments of weathered shale and siltstone, ¼ inch to 3 inches across, and flags of limestone, 3 to 15 inches across; neutral; gradual smooth boundary.

B3t—19 to 26 inches; light olive brown (2.5Y 5/4) shaly silty clay; weak medium angular and subangular blocky structure parting to thin relict platy structure; firm, sticky and plastic; few small roots; few small pores; few clay films; 25 percent coarse fragments of shale and siltstone ¼ inch to 3 inches across and a limestone slab 2 inches thick and 24 inches across; few very small black concretions; moderately alkaline; gradual smooth boundary.

C—26 to 38 inches; olive brown (2.5Y 4/4) interbedded soft clay, or soft shale, and soft siltstone; relict platy structure; very firm, friable when crushed; few clay films on some vertical cracks and on some plates; common black stains on some platy fragments; 45 percent hard fragments of siltstone ¼ inch to 3 inches across and limestone slabs 2 to 3 inches thick and 36 inches across, separated vertically by 6 to 18 inches of soft shale; moderately alkaline.

The solum is 14 to 30 inches thick. Coarse fragments make up 0 to 25 percent, by volume, of the A horizon, 10 to 35 percent of the B horizon, and 25 to 75 percent of the C horizon. Reaction is slightly acid to moderately alkaline throughout. Depth to weathered bedrock ranges from 20 to 40 inches.

The Ap horizon is grayish brown (2.5Y 5/2), dark grayish brown (2.5Y 4/2, 10YR 4/2), or brown (10YR 4/3) silty clay loam or silty clay. Its structure is weak or moderate, fine or medium, granular or subangular blocky.

The B horizon is light olive brown (2.5Y 5/4), olive brown (2.5Y 4/4), brown (10YR 5/3), or yellowish brown (10YR 5/4, 5/6) silty clay or clay or their shaly analogs. Its structure is weak or moderate, fine or medium, angular or subangular blocky.

The C horizon is olive brown (2.5Y 4/4), light olive brown (2.5Y 5/4), olive gray (5Y 5/2), or olive (5Y 5/3). In places it has few to many gray, olive, or brown mottles. The fine material ranges from silty clay to clay.

Eden soils are near the Cynthiana soils on hillsides, they are above the Lowell soils on toe slopes, and they adjoin the Lowell soils on uplands. Eden soils are deeper to bedrock than Cynthiana soils and not so deep as Lowell soils. They have a thinner solum and more coarse fragments throughout than Lowell soils.

EdD—Eden silty clay loam, 12 to 20 percent slopes. This soil is on narrow ridges and the upper part of hillsides above areas of steeper Eden soils. The areas are 30 to 200 acres in size. This soil has the profile described as representative of the series. The surface layer generally is 2 to 12 percent flagstones, but in some areas the flagstones have been removed.

Included with this soil in mapping are small areas of soils that have an olive brown surface layer, soils that have a silt loam surface layer, soils that have a yellowish red, strongly acid subsoil, soils that have a surface layer and subsoil that together are 8 to 14 inches thick, soils that have a plow layer that is 25 to 30 percent flags of limestone and siltstone, and soils that are less than 20 inches deep to bedrock.

This soil is somewhat difficult to till because of the coarse fragments and clay content of the plow layer. Because of steep slopes, the hazard of erosion and the effects of past erosion, it is not generally suited to cultivation. The soil is suited to pasture or hay. All of the locally grown grasses and legumes can be grown, but establishing a stand is difficult because of the moderately fine textured surface layer and the severe hazard of erosion. Capability unit VIe-1.

EfE3—Eden flaggy silty clay, 20 to 30 percent slopes, severely eroded. This soil is on hillsides in areas that cover several hundred acres. Its profile is similar to the one described as representative of the series, but the surface layer is more clayey and is 5 to 25 percent flags of limestone and siltstone. In a few areas the stones have been removed and placed in gullies or stacked in rows.

Included with this soil in mapping are small areas of soils that have a surface layer and subsoil that together are less than 14 inches thick, soils that have gullies 2 to 3 feet deep, soils that have a surface layer that is more than 25 percent flagstones, and soils that are more acid and less flaggy than this Eden soil. Also included are small areas of Rock outcrop and of an Eden soil that has a silt loam surface layer 2 to 4 inches thick.

This soil is suited to limited pasture and to woodland use. The best pasture plants are tall fescue, sericea lespedeza, and annual lespedeza. Establishing a stand and controlling weeds are difficult because of the steep slopes, coarse fragments, clayey texture of the soil, numerous shallow gullies, brush, and small trees. Capability unit VIIe-1.

EhB—Eden and Faywood silty clay loams, 2 to 12 percent slopes. This mapping unit is on the upper part or cap of fairly broad ridges. The areas are transitional between areas of dominantly Eden soils and areas of dominantly Lowell soils. Some areas are mostly Eden soils, others are mostly Faywood soils, and some areas are a mixture of Eden and Faywood soils. The soils in this mapping unit are mostly moderately deep to limestone or to interbedded limestone and shale. The Faywood soil has the profile described as representative of the Faywood series.

Included with this unit in mapping are small, narrow areas of Rock outcrop. The exposed rock is commonly the result of erosion caused by traffic on farm roads.

Crops such as corn and tobacco can be grown, but yields may be low, especially in dry years. Pasture or hay are better suited. Tall fescue, alfalfa, and annual lespedeza are especially suited. Bluegrass grows naturally.

Erosion is the chief hazard if the soils are cultivated. The moderately fine textured surface layer, the steepness and length of slopes, and the practices used to control erosion influence the kind of cropping system needed to keep losses of soil and water within tolerable limits. Contour farming, minimum tillage, contour stripcropping, and grassed waterways help to control erosion and conserve moisture. Capability unit IVe-2.

Faywood Series

The Faywood series consists of moderately deep, well drained soils. These soils formed in residual material that weathered from limestone interbedded with thin layers of calcareous shale. These soils are gently sloping to sloping and border broad areas of Lowell or Nicholson soils.

In a representative profile the surface layer is dark grayish brown light silty clay loam about 7 inches thick. The subsoil is yellowish brown very firm silty clay about 27 inches thick. Limestone interbedded with thin layers of shale is at a depth of about 34 inches.

These soils have a moderately deep root zone. Permeability is moderately slow, and runoff is medium to rapid. The soils are medium acid to neutral throughout. The available water capacity is moderate, and the organic-matter content is low. Natural fertility is medium.

These soils are better suited to plants that furnish continuous cover, but they can be cultivated occasionally. They are used almost entirely for pasture, and only a few soils are used for corn or tobacco.

Representative profile of Faywood silty clay loam, in an area of Eden and Faywood silty clay loams, 2 to 12 percent slopes, about 200 feet north of U.S. Highway 460, 1 mile east of St. Francis Mission, 3.3 miles west of Georgetown.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) light silty clay loam; moderate fine granular structure; friable; many roots; slightly acid; clear smooth boundary.

B2t—7 to 24 inches; yellowish brown (10YR 5/4) silty clay; moderate fine and medium angular blocky structure; very firm, very sticky and plastic; few roots; many clay films; few small concretions; medium acid; gradual smooth boundary.

B3t—24 to 34 inches; yellowish brown (10YR 5/4) silty clay; few fine faint yellowish brown (10YR 5/6), dark yellowish brown (10YR 4/4), and pale brown (10YR 6/3) mottles; moderate fine angular blocky structure; very firm, very sticky and plastic; few roots; common clay films; many small brown concretions; slightly acid; clear wavy boundary.

R—34 inches; limestone interbedded with thin layers of soft calcareous shale.

The solum is 20 to 40 inches thick. Coarse fragments make up 0 to 10 percent, by volume, of the A horizon and B horizon. They are pieces of limestone, siltstone, and shale. The solum ranges from medium acid to neutral throughout. Depth to bedrock ranges from 20 to 40 inches.

The Ap horizon is dark grayish brown (10YR 4/2) or brown (10YR 4/3). Its structure is weak or moderate fine granular or weak fine subangular blocky.

The B2t horizon is yellowish brown (10YR 5/4 or 5/6), dark yellowish brown (10YR 4/4), brown (7.5YR 4/4 or 5/4), or strong brown (7.5YR 5/6) heavy silty clay loam to clay. Its structure is subangular and angular blocky. The B3t horizon is yellowish brown (10YR 5/4 or 5/6) or light olive brown (2.5Y 5/4 or 5/6) silty clay or clay. Mottles are pale brown, light brownish gray, or dark yellowish brown. The structure is weak to moderate, fine to coarse.

In places there is a C horizon that is similar in color and texture to the B3t horizon. It is massive and is 2 to 10 percent coarse fragments.

Faywood soils are on broad ridges with Lowell and Nicholson soils, but they are not so deep to bedrock as those soils. Faywood soils are mapped with Eden soils. They have less coarse fragments and are more acid in the B horizon than Eden soils, and, unlike Eden soils, they are underlain by limestone interbedded with thin layers of shale.

Huntington Series

The Huntington series consists of deep, well drained soils. These soils formed in alluvium that derived mostly from limestone and calcareous shale. These soils are nearly level and gently sloping on flood plains. They are in the southern part of the county.

In a representative profile the surface layer is dark brown silt loam about 18 inches thick. The subsoil is brown, friable silt loam about 28 inches thick. The underlying material is brown silt loam to a depth of 60 inches.

These soils have a deep root zone. Permeability is moderate, and runoff is slow. The available water capacity is high, and the organic-matter content is high. The soils are slightly acid to mildly alkaline throughout. Natural fertility is high. The surface layer is easy to till, and it can be worked within a wide range of moisture content without clodding or crusting.

These soils are suited to cultivated crops. They are used for corn, garden crops, or hay, but many are used for pasture. The soils often flood during winter, but crops are seldom damaged during the growing season.

Representative profile of Huntington silt loam, about 300 feet east of a farm fence and 150 feet north of a point on North Elkhorn Creek that is 0.5 mile east of the Scott and Franklin county line; 9.6 miles west-northwest of Georgetown and 2.2 miles west-southwest of Stamping Ground.

Ap—0 to 9 inches; dark brown (7.5YR 3/2) silt loam; moderate fine and medium granular structure; friable; many roots; slightly acid; clear smooth boundary.

A1—9 to 18 inches; dark brown (7.5YR 3/2) silt loam; moderate medium granular and weak medium subangular blocky structure; friable; many roots; slightly acid; gradual wavy boundary.

B2—18 to 46 inches; brown (10YR 4/3) silt loam; dark brown (10YR 3/3) on ped faces; weak medium subangular blocky structure; friable; few roots; slightly acid; gradual wavy boundary.

C—46 to 60 inches; brown (10YR 4/3) silt loam; massive; friable; slightly acid.

The solum is 40 to more than 60 inches thick. The A horizon is 10 to 24 inches thick. Coarse fragments make up 0 to 5 percent of the A horizon and B horizon, and 0 to 15 percent of the C horizon. Reaction ranges from slightly acid to mildly alkaline throughout. Depth to bedrock ranges from 4 to more than 10 feet.

The Ap horizon, when rubbed, is dark brown (7.5YR 3/2, 10YR 3/3), or very dark grayish brown (10YR 3/2).

In places the B1 horizon has dark brown (10YR 3/3) ped faces but dark grayish brown (10YR 4/2) ped interiors. The B2 horizon is brown (10YR 4/3, 7.5YR 4/4) or dark yellowish brown (10YR 4/4) silt loam or light silty clay loam. Its structure is weak medium subangular blocky or weak fine granular.

The C horizon is brown (10YR 4/3, 7.5YR 4/4) silt loam or light silty clay loam.

Huntington soils are on flood plains with Newark soils. They are in similar positions to Nolin soils, but they are lower than Ashton soils. They are better drained than Newark soils, are darker colored in the upper horizons than Nolin soils, and flood more often and have a thicker dark surface layer than Ashton soils.

Hu—Huntington silt loam. This soil is on long narrow flood plains, mostly in the southern part of the county. Slopes are 0 to 4 percent. The areas are generally more than 50 acres in size.

Included with this soil in mapping are small areas of soils, mostly on streambanks, where slopes are more than 4 percent; soils where gray mottles are below a depth of 18 inches; soils where bedrock is at a depth of 3 to 4 feet; soils that have a dark brown surface layer more than 24 inches thick; soils that have a buried, very dark grayish brown heavy silty clay loam horizon; and soils that have a silty clay loam surface layer. Also included are a few small gravelly and flagstone areas, small wet spots from springs or small farm ponds, and a few areas of Nolin soils.

This soil is well suited to all row crops commonly grown in the county. It is suited to pasture and hay plants including Kentucky bluegrass, tall fescue, orchardgrass, red clover, Ladino clover, and annual lespedeza. In places, tobacco, small grain, and alfalfa can be damaged by floods.

Erosion is not a hazard on this soil. The soil is suitable for continuous cultivation, but proper fertilization, maintenance of organic matter, and good tillage practices are needed to keep it productive. Capability unit I-1.

Lowell Series

The Lowell series consists of deep, well drained soils. These soils formed in material that weathered from limestone (fig. 6) or interbedded limestone, shale, and siltstone. These soils are gently sloping and sloping on ridges and on the upper part of hillsides and toe slopes.

In a representative profile the surface layer is brown silt loam about 7 inches thick. The subsoil is about 50 inches thick. In the upper 6 inches it is dark yellowish brown, friable silty clay loam; in the 10 inches below that it is yellowish brown, firm silty loam; in the next 7 inches it is strong brown, firm silty clay; and in the lowermost part it is yellowish brown, firm or very firm silty clay and clay. The underlying material is yellowish brown, extremely firm clay. It extends to a depth of 68 inches.

These soils have a deep root zone. Root penetration and air and water movement is somewhat impeded by the clayey layers in the subsoil. Permeability is moderately slow, and runoff is medium to rapid. The available water capacity is moderate, and the organic-matter content is low in most places. The surface layer and upper part of the subsoil range from strongly acid to neutral; the lower part of the subsoil is strongly acid to slightly acid. Natural fertility is medium.

These soils are mostly in permanent vegetation, but some less sloping soils are cultivated and used for corn and tobacco. The plow layer is easy to till except in small, eroded spots.

Representative profile of Lowell silt loam, 2 to 6 percent slopes, about 200 feet northwest of a barn and 700 feet west of a farmhouse that is 6 miles east of Georgetown and 0.6 mile north of U.S. Highway 227 (Laboratory No. S72KY-105-3).

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; very friable; many small roots; few small black concretions; medium acid; clear smooth boundary.

B1—7 to 13 inches; dark yellowish brown (10YR 4/4) light silty clay loam; weak medium subangular blocky structure; friable; common small roots; few small pores; few small black concretions; medium acid; clear smooth boundary.

B21t—13 to 23 inches; yellowish brown (10YR 5/6) heavy silty clay loam; moderate medium angular blocky structure parting to fine angular blocky; firm, common small roots; few small pores; many clay films; common black concretions; slightly acid; gradual smooth boundary.

B22t—23 to 30 inches; strong brown (7.5YR 5/6) silty clay; common fine faint light yellowish brown (10YR 6/4) mottles and few medium faint pale brown (10YR 6/3) mottles; moderate medium angular blocky structure parting to moderate fine angular blocky; firm, sticky and plastic; few small roots; few small pores; many clay films; common small black concretions; few soft concretions and black stains on ped faces; slightly acid; gradual wavy boundary.

B23t—30 to 37 inches; yellowish brown (10YR 5/6) silty clay; few medium faint pale brown (10YR 6/3) mottles; moderate medium angular blocky structure; firm; few small pores; common small black concre-

***Figure 6.*—Rubbly limestone underlying Lowell soils.**

tions; many clay films; few black coatings; slightly acid; gradual wavy boundary.

B24t—37 to 45 inches; yellowish brown (10YR 5/6) clay; few fine faint yellowish brown (10YR 5/4) mottles; moderate medium angular blocky structure parting to very fine angular blocky; firm, sticky and plastic; occasional small roots; many clay films; few small black concretions; strongly acid; gradual wavy boundary.

B3—45 to 57 inches; yellowish brown (10YR 5/6) clay; many medium distinct light gray (10YR 7/2) mottles; weak fine angular blocky structure; very firm, very sticky and very plastic; many soft concretions and black stains in an irregular pattern; few slickensides; medium acid; diffuse smooth boundary.

C—57 to 68 inches; yellowish brown (10YR 5/6) clay; many medium distinct light gray (10YR 7/2) mottles; massive; extremely firm; many soft concretions and black stains in an irregular pattern; few slickensides; medium acid.

The solum is 40 to 60 inches thick. It is mainly slightly acid to strongly acid but ranges to neutral in the upper part if the soil is limed. Depth to bedrock is more than 40 inches.

The Ap horizon is brown (10YR 4/3) or dark grayish brown (10YR 4/2). In places, the ped faces are dark brown (10YR 3/3). The structure is moderate or weak, fine granular or weak, medium subangular blocky.

The B1 horizon is brown (10YR 4/3) or dark yellowish brown (10YR 4/4) silt loam or silty clay loam. In some places there is no B1 horizon. The B2 horizon is yellowish brown (10YR 5/6), dark yellowish brown (10YR 4/4), brown (7.5YR 4/4), or strong brown (7.5YR 5/6). Common, fine, distinct, pale brown, light yellowish brown, strong brown, or light olive brown mottles are in the middle and lower parts of the B2 horizon in some profiles. The B2 horizon ranges from heavy silty clay loam to clay. The B3 horizon is yellowish brown (10YR 5/4, 5/6) or light olive brown (2.5Y 5/4, 5/6) silty clay or clay. Mottles are light gray, light brownish gray, pale brown, light yellowish brown, or strong brown. The structure is massive, or it is weak, fine or medium, angular blocky.

The C horizon is similar in color and texture to the B3 horizon.

Lowell soils are near the Nicholson soils on broad ridges, they adjoin areas of Faywood and Eden soils, and they are in narrow valleys with Nolin soils. Lowell soils lack the fragipan of Nicholson soils, they are deeper to bedrock than Faywood soils, and they have a solum that is thicker and has less coarse fragments than that of Eden soils. They have a finer textured subsoil than Nolin soils.

LoB—Lowell silt loam, 2 to 6 percent slopes. This soil is on fairly broad ridges. The areas are 10 to 200 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are narrow areas of soils that have a dark brown surface layer and small areas of soils that have a yellowish red subsoil and soils that have less clay in the subsoil than Lowell soils. Also included are small areas of Nicholson soils and of Faywood soils.

This Lowell soil is suited to crops commonly grown in the county, such as corn, tobacco, and small grain. It is also suited to pasture and hay plants including Kentucky bluegrass, tall fescue, orchardgrass, red clover, alfalfa, Ladino clover, and annual lespedeza.

Erosion is the main hazard if this soil is cultivated. The steepness and length of slopes and the practices used to control erosion influence the kind of cropping system needed to keep losses of soil and water within tolerable limits. Contour farming, minimum tillage, contour stripcropping, and grassed waterways help control erosion and conserve moisture. Capability unit IIe-2.

LoC—Lowell silt loam, 6 to 12 percent slopes. This soil is generally in narrow areas below broad areas of gently sloping Lowell and Nicholson soils. It has a profile similar to the one described as representative of the series, but the surface layer is about 2 inches thinner and the upper part of the subsoil is heavy silty clay loam.

Included with this soil in mapping are small areas of Faywood, Nicholson, and Eden soils. Also included are a few areas of soils that have a yellowish red subsoil, small areas of severely eroded soils that have a surface layer of silty clay loam, a few small seepy areas, and small flagstone areas.

This Lowell soil is suited to crops commonly grown in the county, such as corn, tobacco, and small grain. It is also suited to pasture and hay plants such as Kentucky bluegrass, orchardgrass, tall fescue, alfalfa, red clover, Ladino clover, and annual lespedeza.

Erosion is the main hazard if this soil is cultivated. The steepness and length of slopes and the practices used to control erosion influence the kind of cropping system needed to keep losses of soil and water within tolerable limits. Contour farming, minimum tillage, contour stripcropping, and grassed waterways help to control erosion and conserve moisture. Capability unit IIIe-2.

LwB—Lowell-Nolin silt loam, 2 to 10 percent slopes. This mapping unit is in long narrow areas below areas of steep Eden soils. The areas range from 10 to 150 acres in size. The Lowell soil has a profile similar to the one described as representative of the series, but the subsoil is yellowish brown or light olive brown. This mapping unit is about 50 percent Lowell soils, 30 percent Nolin soils, and 20 percent other soils.

Included in mapping are many areas of soils that have a surface layer of light silty clay loam, very small areas of a somewhat poorly drained soil, narrow areas of soils that have slopes of more than 10 percent, a few small areas of eroded soils that have a silty clay surface layer, and of soils that have a thin compact fragipan. Also included are small areas of soils that have gravel or flagstones on the surface, soils where the lower part of the subsoil is light silty clay loam, and soils that are less than 40 inches deep to bedrock. Many of these areas are a result of material that washed from plowed hillsides, land leveling, stream straightening, and deposits and cuts from flash floods.

The soils are suited to crops commonly grown in the county, such as corn, tobacco, and small grain. They are also suited to pasture and hay plants including tall fescue, orchardgrass, alfalfa, red clover, white clover, and annual lespedeza. In places tobacco, small grain, and alfalfa can be damaged by floods and wetness.

Slopes are generally short, but some erosion is caused by runoff from higher lying, steep soils. As a result, diversion ditches are generally needed. Contour farming, minimum tillage, and grassed waterways also help to control erosion and conserve moisture. Capability unit IIe-2.

Maury Series

The Maury series consists of deep, well drained soils. These soils formed in thin loess and underlying alluvium or residuum, or both, which weathered from phosphatic limestone. They are underlain by solid limestone in many places (fig. 7). The soils are gently sloping and sloping and are in broad areas in the southern part of the county.

In a representative profile the surface layer is dark brown silt loam about 16 inches thick. The subsoil is more than 59 inches thick. In the upper 5 inches it is brown, very friable silty clay loam; in the 8 inches below that it is reddish brown, friable silty clay loam; in the next 13 inches it is yellowish red, friable silty clay; and in the lower part to a depth of 75 inches it is yellowish red or brown, firm or very firm clay.

These soils have a deep root zone. Permeability is moderate, and runoff is medium. The available water capacity is high, and the organic-matter content is moderate. The surface layer and upper part of the subsoil range from strongly acid to neutral; the lower part of the subsoil is strongly acid to medium acid. Natural fertility is high. Many of the soils are high in phosphate. The surface layer is easy to till.

These soils are well suited to cultivated crops. They are used for tobacco, corn, hay, or bluegrass pasture. The phosphate content of the soils makes the grass ideally suited to race horses. Most horse farms in the county are on Maury soils.

Representative profile of Maury silt loam, 2 to 6 percent slopes, 750 feet east of a farmhouse, 0.4 mile north of U.S. Highways 227 and 460, on private road that is about 1.2 miles east of Interstate 75 exchange and about 3 miles east of Georgetown.

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, brown (10YR 4/3) when crushed; moderate fine and medium granular structure; very friable; many fine roots; slightly acid; gradual smooth boundary.

A3—8 to 16 inches; dark brown (7.5YR 3/2) silt loam, brown (7.5YR 4/4) when crushed; moderate fine and medium granular structure; very friable; many fine roots; few fine pores; slightly acid; clear smooth boundary.

B1—16 to 21 inches; brown (7.5YR 4/4) silty clay loam; weak fine granular and subangular blocky structure; very friable; common fine roots; few fine pores; few small areas of earthworm casts; medium acid; clear smooth boundary.

B21t—21 to 29 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure parting to strong very fine angular blocky; friable,

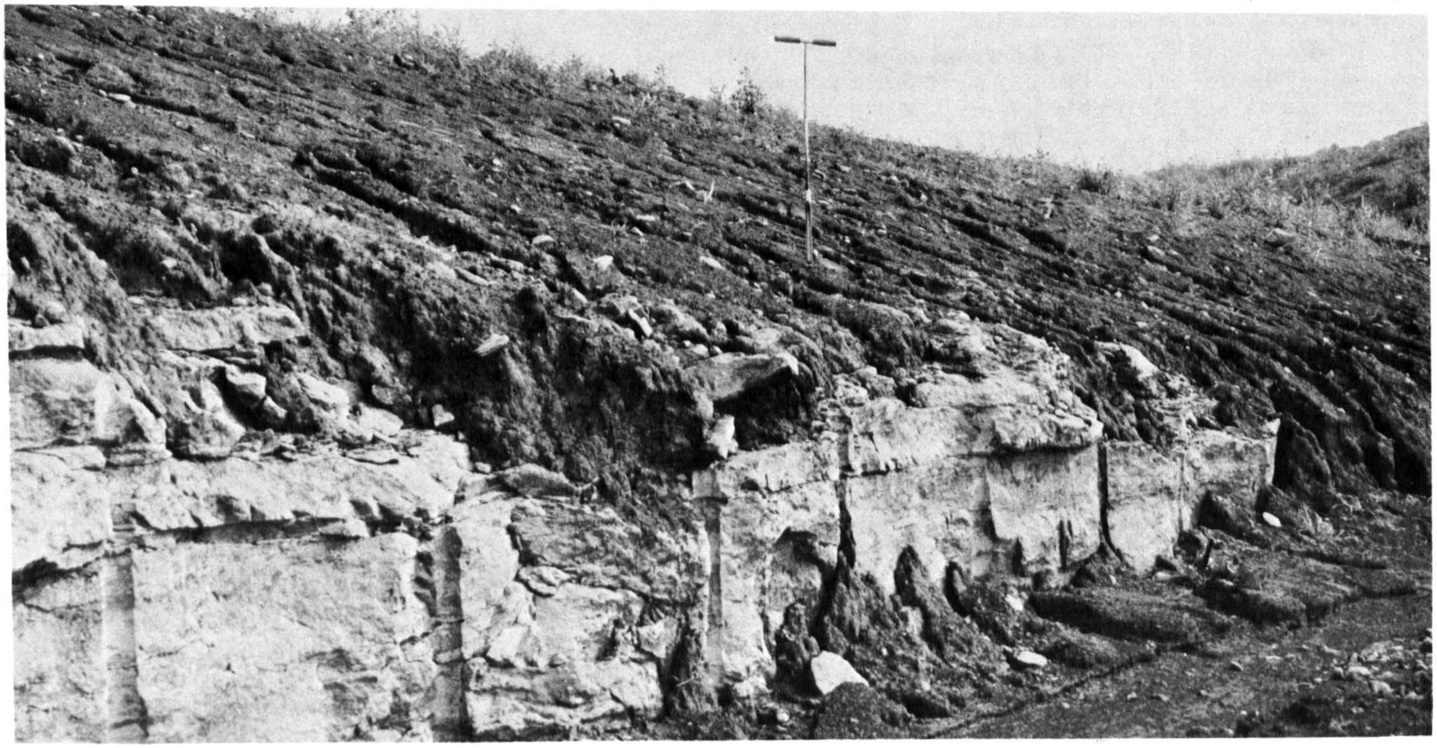

Figure 7.—Solid limestone underlies these Maury soils.

sticky and slightly plastic; few fine roots; few small pores; many clay films; few small black concretions; medium acid; gradual smooth boundary.

B22t—29 to 42 inches; yellowish red (5YR 4/6) silty clay; moderate medium angular blocky structure parting to strong very fine angular blocky; friable, sticky and slightly plastic; few fine roots; few fine pores; many clay films; common small black concretions; few very small yellowish chert flocks; medium acid; gradual smooth boundary.

B23t—42 to 61 inches; yellowish red (5YR 4/6) clay; moderate medium angular blocky structure parting to strong very fine angular blocky; firm, sticky and slightly plastic; very few fine roots; many clay films; common small black concretions and stainings; common small yellowish chert flocks and a few chert fragments less than 1 inch in diameter; strongly acid; abrupt wavy boundary.

B3t—61 to 75 inches; brown (7.5YR 4/4) clay interlayered with pale brown (10YR 6/3); weak medium angular blocky structure; very firm, sticky and slightly plastic; many clay films; common small black concretions and a few thin horizontal layers of soft black material; common small yellowish chert flecks; strongly acid.

The solum is more than 60 inches thick. Small chert fragments make up 0 to 2 percent, by volume, of the solum. The solum is strongly acid to medium acid but ranges to neutral in the upper part if the soil is limed. Depth to bedrock ranges from 5 to more than 10 feet.

The uncrushed Ap horizon is dark yellowish brown (10YR 3/4) or dark brown (10YR 3/3, 7.5YR 3/2). The crushed Ap horizon is brown (10YR 4/2), dark grayish brown (10YR 4/2), or brown (7.5YR 4/2, 4/4). In some profiles there is an A1 horizon or A3 horizon that is 3 to 6 inches and is dark brown (7.5YR 3/2) or brown (7.5YR 4/4) crushed.

The B1 horizon is brown (7.5YR 4/4) or reddish brown (5YR 4/4) silt loam or light silty clay loam. The B21t horizon and B22t horizon are reddish brown (5YR 4/4), dark reddish brown (5YR 3/4), yellowish red (5YR 4/6), or red (2.5YR 4/6) silty clay loam to silty clay. The B23t horizon is similar in color to the B22t. It is silty clay or clay.

Maury soils are on broad uplands with McAfee, Lowell, and Nicholson soils, and they are above Ashton soils. They are deeper to bedrock than McAfee soils and have redder and more friable horizons in the subsoil than Lowell soils. They lack a fragipan and are better drained than Nicholson soils, and have a finer textured subsoil than Ashton soils.

MaB—Maury silt loam, 2 to 6 percent slopes. This soil is on broad uplands. The areas range from 20 to several hundred acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are areas of soils that have slopes of less than 2 percent, a few small areas of soils that are 5 to 15 percent chert in the subsoil, a few areas of soils that are dark yellowish brown in the upper part of the subsoil, and small areas of soils that are less than 60 inches deep to bedrock.

This soil is suited to all crops commonly grown in the county, such as corn, tobacco, and small grain. Kentucky bluegrass and white clover are especially suited. All pasture and hay plants grown in the county are suited. Truck crops and nursery stock plants are also well suited.

Erosion is the main hazard if this soil is cultivated. The steepness and length of slopes and the practices used to control erosion influence the kind of cropping system needed to keep losses of soil and water within tolerable limits. Contour farming, minimum tillage, contour stripcropping, and grassed waterways help to control erosion and conserve moisture. The soil is well suited to sprinkler irrigation. Capability unit IIe-1.

MaC—Maury silt loam, 6 to 12 percent slopes. This soil is in long, narrow areas, generally bordering larger areas of less sloping Maury soils. Some areas surround sinkholes.

Included with this soil in mapping are small areas of soils that are less than 60 inches deep to bedrock, a few small areas of soils that are 3 to 5 percent chert in the surface layer, small areas of soils that are 5 to 10 percent chert in the subsoil, and small areas of Huntington soils along drainageways and in sinkholes.

This Maury soil is suited to crops commonly grown in the county such as corn, tobacco, and small grain. Kentucky bluegrass and white clover are especially suited. Truck crops and nursery stock plants are also well suited.

Erosion is the main hazard if this soil is cultivated. The steepness and length of slopes and the practices used to control erosion influence the kind of cropping system needed to keep losses of soil and water within tolerable limits. Contour farming, minimum tillage, contour stripcropping, and grassed waterways help to control erosion and conserve moisture. The soil is well suited to sprinkler irrigation. Capability unit IIIe-1.

McAfee Series

The McAfee series consists of moderately deep, well drained soils. These soils formed in residuum that weathered from phosphatic limestone. These soils are sloping and moderately steep and border areas of Maury soils.

In a representative profile the surface layer is dark brown silt loam about 7 inches thick. The subsoil is about 25 inches thick. In the upper 6 inches it is brown, friable silty clay loam; in the next 12 inches it is reddish brown firm silty clay; and in the lowermost part it is brown, firm silty clay. Limestone bedrock is at a depth of about 32 inches.

These soils have a moderately deep root zone. Permeability is moderately slow, and runoff is rapid. The available water capacity is moderate, and the organic-matter content is moderate. The soils range from medium acid to neutral. Natural fertility is medium. The plow layer is easy to cultivate.

A few areas of these soils are used for corn or tobacco, but most soils are used for pasture or hay.

Representative profile of McAfee silt loam, 6 to 12 percent slopes, about 950 feet south of a point on State Highway 1689 that is in a curve of a road about 150 feet east of a barn, or 0.5 mile (by road) east of the Scott and Franklin county line, or 1.8 miles west of U.S. Highway 227; 9.7 miles west-northwest of Georgetown and 3.8 miles north of U.S. Highway 460.

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

B1t—7 to 13 inches; brown (7.5YR 4/4) silty clay loam; moderate fine subangular blocky and moderate fine granular structure; friable; common roots; common clay films; few small brown concretions; slightly acid; gradual smooth boundary.

B2t—13 to 25 inches; reddish brown (5YR 4/4) silty clay; moderate medium subangular blocky structure; firm; few roots; common clay films; common small brown concretions; slightly acid; gradual smooth boundary.

B3—25 to 32 inches; brown (7.5YR 4/4) silty clay; weak fine angular blocky structure; firm, sticky and plastic; 15 percent coarse fragments of chert and limestone; common dark concretions; medium acid; clear smooth boundary.

R—32 inches; limestone bedrock.

The solum is 20 to 40 inches thick. Chert fragments make up 0 to 15 percent of the solum. The solum is mainly medium acid to slightly acid but the A horizon ranges to neutral if the soil is limed. Depth to bedrock ranges from 20 to 40 inches.

The Ap horizon is dark brown (10YR 3/3, 7.5YR 3/2) or very dark grayish brown (10YR 3/2).

The B1t horizon is brown (7.5YR 4/4), reddish brown (5YR 4/4), or dark reddish brown (5YR 3/4) silty clay loam or silty clay. Its structure is weak, moderate, or strong, fine or medium, angular or subangular blocky or granular. The B2t horizon is reddish brown (5YR 4/4), yellowish red (5YR 4/6), or dark reddish brown (5YR 3/4) silty clay or clay. Its structure is moderate or strong, fine or medium, angular or subangular blocky. The B3 horizon is brown (7.5YR 4/4) or reddish brown (5YR 4/3 or 4/4) silty clay or clay. It has a few clay films in places.

In places, there is a thin C horizon that is similar in color and texture to the B3 horizon. It is 1 to 25 percent coarse fragments of chert.

McAfee soils are on broad uplands with Cynthiana and Maury soils. They are deeper to bedrock than Cynthiana soils, and shallower to bedrock than Maury soils.

McC—McAfee silt loam, 6 to 12 percent slopes. This soil is mainly in fairly narrow areas below large areas of gently sloping Maury soils. It also surrounds areas of sinkholes. The soil has the profile described as representative of the series.

Included with this soil in mapping are areas of eroded soils that have a 3- to 6-inch surface layer, a few small areas of soils that have a cherty surface layer, small areas of soils that are more than 40 inches deep to bedrock, and small areas of Huntington soils in sinkholes.

This McAfee soil is suited to all crops commonly grown in the county, including corn, tobacco, and small grain; all pasture and hay plants, especially Kentucky bluegrass and white clover; and truck crops and nursery stock plants.

Erosion is the main hazard if this soil is cultivated. The steepness and length of slopes and the practices used to control erosion influence the kind of cropping system needed to keep losses of soil and water within tolerable limits. Contour farming, minimum tillage, contour stripcropping, and grassed waterways help to control erosion and conserve moisture. Capability unit IIIe-3.

McD—McAfee silt loam, 12 to 20 percent slopes. This soil is in fairly small, narrow areas bordering large areas of less sloping Maury soils. Its profile is similar to the one described as representative of the series, but the surface layer is heavy silt loam or light silty clay loam 3 to 7 inches thick.

Included with this soil in mapping are areas of eroded soils that have a dark brown surface layer less than 6 inches thick, small areas of soils more than 40 inches deep to bedrock, small areas of soils less than 20 inches deep to bedrock, and a few small, narrow bands of Rock outcrop.

This McAfee soil is suited to pasture, hay, or trees, and it can be cultivated occasionally if erosion is controlled. All locally grown grasses and legumes are suitable. Establishing a stand is difficult because of the moderately steep slopes and severe hazard of erosion. Capability unit IVe-1.

Newark Series

The Newark series consists of deep, somewhat poorly drained soils. These soils formed in alluvium that derived from mostly limestone and calcareous shale. These soils are nearly level on flood plains along many streams.

In a representative profile the surface layer is dark grayish brown silt loam about 7 inches thick. The subsoil is about 29 inches thick. In the upper 11 inches it is brown, very friable silt loam that has light brownish gray mottles; and in the lower 18 inches it is light brownish gray, friable silt loam that has brown and grayish brown mottles. The underlying material extends to a depth of 60 inches. In the upper 19 inches it is light brownish gray, mottled silty clay loam; and in the lower 5 inches it is gray, mottled silty clay loam.

These soils have a deep root zone. Permeability is moderate, but runoff is very slow. The available water capacity is high, and the organic-matter content is low. The soils are slightly acid to mildly alkaline throughout. Natural fertility is medium. The surface layer is easy to till.

If adequately drained, these soils are well suited to cultivated crops. The soils are flooded in winter, and crops are sometimes damaged during the growing season. Most areas of these soils are in pasture and only a few are used for corn. A few small areas are in deciduous trees.

Representative profile of Newark silt loam, about 30 feet west of a farm fence and 350 feet south of a point on an old abandoned railroad that is 2,000 feet east of the Scott and Franklin county line; 9.8 miles west-northwest of Georgetown and 0.2 mile north of North Elkhorn Creek.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many roots; slightly acid; clear smooth boundary.

B1—7 to 18 inches; brown (10YR 4/3) silt loam; common fine distinct light brownish gray (10YR 6/2) mottles and common fine faint dark grayish brown (10YR 4/2) mottles; weak fine subangular blocky structure; very friable; few roots; slightly acid; gradual smooth boundary.

B2g—18 to 36 inches; light brownish gray (10YR 6/2) silt loam; many fine distinct brown (10YR 4/3) mottles and many fine faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; few roots; slightly acid; gradual smooth boundary.

C1g—36 to 55 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine distinct yellowish brown (10YR 5/4) mottles and common fine distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; few small brown concretions; slightly acid; gradual smooth boundary.

C2g—55 to 60 inches; gray (10YR 5/1) heavy silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; massive; firm; slightly sticky and slightly plastic; few small brown concretions; slightly acid.

The solum is 20 to 40 inches thick. Coarse fragments make up 0 to 5 percent of the solum, and 0 to 15 percent of the C horizon. Reaction ranges from slightly acid to mildly alkaline throughout. Depth to bedrock ranges from 4 to more than 10 feet.

The Ap horizon is dark grayish brown (10YR 4/2, 2.5Y 4/2) or brown (10YR 4/3). It has few fine, faint, light brownish gray mottles in places.

The B1 horizon is brown (10YR 4/3), dark grayish brown (10YR 4/2, 2.5Y 4/2), dark yellowish brown (10YR 4/4), or olive brown (2.5Y 4/4). Mottles are few to many and are grayish brown, dark grayish brown, or light brownish gray. The structure is weak, fine, granular or weak, fine, subangular blocky. The B2 horizon is light brownish gray (10YR 6/2, 2.5Y 6/2), grayish brown (10YR 5/2, 2.5Y 5/2), gray (10YR 5/1), or dark gray (10YR 4/1) silt loam or light silty clay loam. Mottles are brown, dark yellowish brown, olive brown, or grayish brown.

The C horizon is light brownish gray (10YR 6/2, 2.5Y 6/2), gray (10YR 5/1), light olive gray (5Y 6/2), or dark gray (10YR 4/1) silt loam to light silty clay. Mottles are few to many, fine to coarse, faint to distinct. They are yellowish brown, dark yellowish brown, strong brown, brown, or light olive brown.

Newark soils are on flood plains with Huntington and Nolin soils, and they are slightly below Lowell soils. Newark soils are less well drained than those soils, and they have less clay in the subsoil than Lowell soils.

Ne—Newark silt loam. This soil is nearly level. It is on the flood plains in areas that are mostly long and narrow and 5 to 15 acres in size. Slopes are 0 to 2 percent.

Included with this soil in mapping were several small areas and one fairly large area of poorly drained soils near North Elkhorn Creek, a few small areas of moderately well drained soils, small areas of soils that have a heavy silty clay loam subsoil, a few areas of soils that have a very dark gray subsoil, and areas of soils that have light silty clay at a depth of about 30 inches.

If adequately drained, this soil is suited to corn, soybeans, small grain, and other row crops. It is also suited to pasture and hay plants including tall fescue, orchardgrass, Ladino clover, red clover, and annual lespedeza. It is generally not suited to tobacco.

Wetness is the main limitation, but it can be reduced by artificial drainage. Crops can be damaged by floods at times. Maintaining the organic-matter content and good tillage practices are needed to keep the soil productive if it is in continuous cultivation. Capability unit IIw-1.

Nicholson Series

The Nicholson series consists of deep, moderately well drained soils that have a fragipan. The upper part of these soils formed in loess, but the lower part formed in residual material that weathered from interbedded limestone and calcareous shale. These soils are gently sloping on fairly broad uplands.

In a representative profile the surface layer is dark grayish brown silt loam about 7 inches thick. The subsoil is 33 inches thick. In the upper 14 inches it is brown and dark yellowish brown, friable silty clay loam. The next 13 inches is a fragipan of dark yellowish brown very firm and brittle silty clay loam that is mottled with brown and gray. In the lowermost part, the subsoil is yellowish brown, firm silty clay. The underlying material is yellowish brown, very firm clay. It extends to a depth of 60 inches.

These soils have a moderately deep root zone. The fragipan impedes root penetration and air and water movement. Permeability is moderate above the fragipan, and slow in the pan. A perched water table forms during heavy rain. Runoff is medium. The available water capacity is moderate, and the organic-matter content is low. The surface layer and upper part of the subsoil range from neutral to strongly acid, the middle part from medium acid to very strongly acid, and the lower part from very strongly acid to mildly alkaline. Natural fertility is medium. The surface layer is easy to till.

These soils are suited to cultivated crops and pasture (fig. 8). Many areas are used for burley tobacco or corn, and some are used for pasture or hay.

Representative profile of Nicholson silt loam, 2 to 6 percent slopes, about 30 feet north of a fence, 550 feet southwest of farmhouse, and 600 feet east of county road;

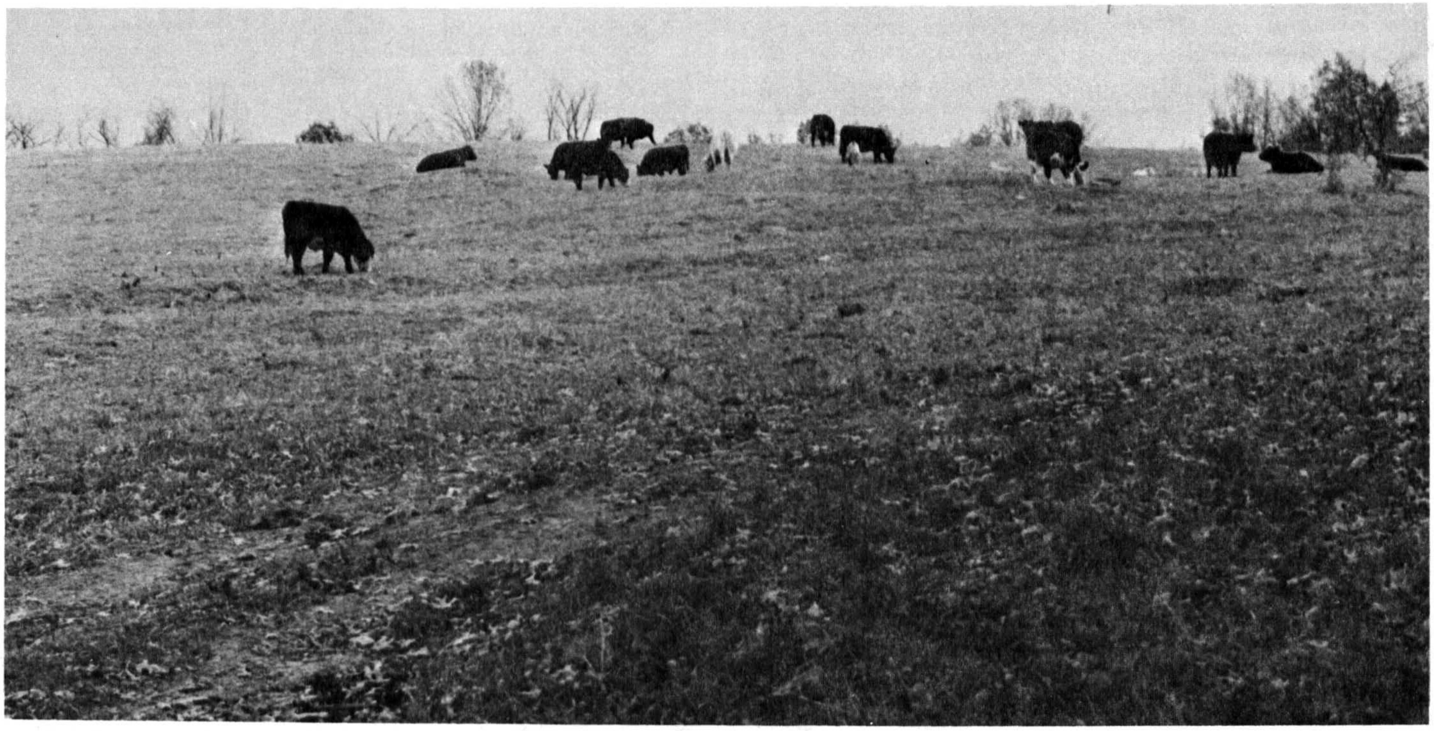

***Figure 8.*—Pasture on Nicholson silt loam, 2 to 6 percent slopes.**

5.6 miles west of Georgetown and 0.5 mile south of U.S. 460.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many small roots; neutral; clear smooth boundary.

B21t—7 to 18 inches; brown (10YR 4/3) light silty clay loam; few fine faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; many roots; common clay films; slightly acid; gradual smooth boundary.

B22t—18 to 21 inches; dark yellowish brown (10YR 4/4) light silty clay loam; yellowish brown (10YR 5/4) on ped faces; moderate medium subangular blocky structure; friable; few roots; common clay films; few dark concretions; strongly acid; abrupt wavy boundary.

Bx—21 to 34 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles and common fine faint brown (7.5YR 4/4) mottles; coatings between prisms are light brownish gray (10YR 6/2) and light gray (10YR 7/2); moderate very coarse prismatic structure parting to moderate medium platy; very firm, compact and brittle; few small roots between prisms; common clay films; common black concretions and thin black coatings; strongly acid; gradual wavy boundary.

IIB3t—34 to 40 inches; yellowish brown (10YR 5/4) silty clay; common fine distinct light brownish gray (10YR 6/2 and 2.5Y 6/2) mottles and few fine faint brown (7.5YR 4/4) mottles; moderate medium angular blocky structure; firm, sticky and plastic; common clay films; common black concretions and concretionary material; strongly acid; gradual wavy boundary.

IIC—40 to 60 inches; yellowish brown (10YR 5/6) clay; common fine distinct pale brown (10YR 6/3) mottles and few fine distinct light brownish gray (2.5Y 6/2) mottles; massive; very firm, very sticky and very plastic; common dark concretionary material; neutral.

The solum is 40 to 80 inches thick. The fragipan is at a depth of 16 to 30 inches. It is 7 to 20 inches thick. Reaction is mainly very strongly acid to medium acid through the fragipan, but ranges to neutral in the upper part if the soil is limed. It is very strongly acid to mildly alkaline below the fragipan. Depth to bedrock ranges from 5 to more than 8 feet.

The Ap horizon is brown (10YR 4/3) or dark grayish brown (10YR 4/2). Its structure is weak or moderate.

In places there is a B1 horizon that is brown (7.5YR 4/4) or dark yellowish brown (10YR 4/4) silt loam. The B21t horizon is yellowish brown (10YR 5/4 or 5/6), brown (10YR 4/3, 7.5YR 4/4), or dark yellowish brown (10YR 4/4) light silty clay loam or silt loam. In some profiles, mottles that have chroma of 2 or less are in the lower part of this horizon. The Bx horizon is dark yellowish brown (10YR 4/4), yellowish brown (10YR 5/4 or 5/6), or strong brown (7.5YR 5/6). Its structure is weak or moderate very coarse prismatic. The IIB3t horizon is yellowish brown (10YR 5/4 or 5/6), dark yellowish brown (10YR 4/4), or light olive brown (2.5Y 5/4 or 5/6) silty clay or clay.

Nicholson soils are near Lowell, Faywood, and Maury soils. Nicholson soils are less well drained than those soils and, unlike them, have a fragipan.

NfB—Nicholson silt loam, 2 to 6 percent slopes. This soil is on fairly broad ridges. The areas are 10 to 50 acres in size.

Included with this soil in mapping are a few areas of soils that have a 6- to 10-inch dark brown surface layer; small areas of soils that have slopes of less than 2 percent; a few areas of soils that have slopes of 6 to 12 percent; small areas of soils that have a fragipan at a depth of 30 to 36 inches; very small areas of soils that have a fragipan that is less than 7 inches thick; and a few areas of soils that have a highly mottled silty clay horizon or a concretionary zone instead of a fragipan. Also included are a few small areas of soils that have a few, fine, faint, light brownish gray mottles within 16 inches of the surface, areas of Lowell soils, and areas on stream terraces that are underlain by silty clay loam alluvium.

This Nicholson soil is suited to crops commonly grown in the county, such as corn, tobacco, or small grain. A seasonal water table can cause some damage to crops. Some suitable pasture and hay plants are Kentucky bluegrass, tall fescue, orchardgrass, red clover, Ladino clover, white clover, alfalfa, and annual lespedeza. Alfalfa can be damaged by the perched seasonal water table.

Erosion is the main hazard if this soil is cultivated. The steepness and length of slopes and the practices used to control erosion influence the kind of cropping system needed to keep losses of soil and water within tolerable limits. Contour farming, minimum tillage, contour stripcropping, and grassed waterways help to control erosion and conserve moisture. Capability unit IIe-3.

Nolin Series

The Nolin series consists of deep, well drained soils. These soils formed in alluvium that derived from mostly limestone and calcareous shale. These soils are nearly level and gently sloping on flood plains along the streams in the northern part of the county.

In a representative profile the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil is brown, friable silt loam about 47 inches thick. The lower 7 inches is mottled with light brownish gray. The underlying material is grayish brown silt loam that extends to a depth of 60 inches.

These soils have a deep root zone. Permeability is moderate, and runoff is slow. The available water capacity is high, and the organic-matter content is moderate. The soils are slightly alkaline and mildly alkaline throughout. Natural fertility is high. The surface layer is easy to till.

These soils are suited to most cultivated crops. They are used for burley tobacco, corn, or garden crops, but many are in grass and are used for hay or pasture. The soils are often flooded during winter, but crops are seldom damaged during the growing season.

Representative profile of Nolin silt loam, about 120 feet south of a county road junction and 120 feet west of Lytles Fork; 10.3 miles north by northwest of Georgetown and 0.8 mile east-northeast of Longlick.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many roots; neutral; gradual smooth boundary.

B21—8 to 30 inches; brown (10YR 5/3) silt loam; weak fine subangular blocky structure; friable; common fine roots; neutral; gradual smooth boundary.

B22—30 to 48 inches; brown (10YR 4/3) silt loam; weak fine subangular blocky structure; friable; few roots; neutral; gradual smooth boundary.

B3—48 to 55 inches; brown (10YR 5/3) silt loam; common fine faint light brownish gray (10YR 6/2) mottles and common fine distinct light brownish gray (2.5Y 6/2) mottles; weak fine granular structure; friable; common dark brown and black soft concretionary material; neutral; clear smooth boundary.

C—55 to 60 inches; grayish brown (2.5Y 5/2) silt loam; common fine distinct brown (7.5 4/4) mottles; massive; friable; common black soft concretions; mildly alkaline.

The solum is more than 40 inches thick. Coarse fragments make up 0 to 5 percent of the A horizon and B horizon and 0 to 15 percent of the C horizon. Reaction ranges from slightly acid to mildly alkaline throughout. Depth to bedrock ranges from 4 to more than 10 feet.

The Ap horizon is dark grayish brown (10YR 4/2, 2.5Y 4/2) or brown (10YR 4/3).

The B horizon is brown (10YR 4/3 or 5/3), dark yellowish brown (10YR 4/4), yellowish brown (10YR 5/4), or olive brown (2.5Y 4/4) silt loam or light silty clay loam. In places, the B22 horizon and B3 horizon have gray mottles. Their structure is weak fine granular to weak medium subangular.

The C horizon is silt loam or silty clay loam.

Nolin soils are on flood plains with Newark soils, they are lower than Lowell soils, but they occur in similar positions as Huntington soils. Nolin soils are better drained than Newark soils, have less clay in the subsoil than Lowell soils, and are lighter colored in the upper horizons than Huntington soils.

No—Nolin silt loam. This soil is on long, narrow flood plains along many of the streams in the northern part of the county. Slopes are 0 to 4 percent. The areas are up to 50 acres in size.

Included with this soil in mapping are small areas of moderately well drained soils that have gray mottles at a depth of about 16 inches; small areas of soils that have a gravelly silt loam surface layer; and small areas of soils that are less than 40 inches deep to bedrock. Also included are very small flagstone areas, a few areas of soils that have a buried heavy silty clay loam subsoil, a few small wet spots from farm ponds or springs, areas of soils that have a dark brown surface layer, and areas of soils that have a light silty clay loam surface layer.

This soil is well suited to all row crops commonly grown in the county. It is also suited to pasture and hay plants including Kentucky bluegrass, tall fescue, orchardgrass, red clover, Ladino clover, and annual lespedeza.

Erosion is not a hazard on this soil, but in places tobacco, small grain, and alfalfa can be damaged by floods. The soil is suitable for continuous cultivation if proper fertilization, maintenance of organic matter, and good tillage practices are followed to keep the soil productive. Capability unit I-1.

Rock Outcrop

Rock outcrop consists of limestone outcrops or soil material less than 6 inches thick over limestone. It is mapped only in a complex with Cynthiana soils because it is intermingled in such intricate patterns that separation on the map is not practical. It supports very little plant growth, but clumps of grass, brush, or stunted trees survive in cracks and crevices.

Use and Management of the Soils

In this section the use and management of soils for crops and pasture, for woodland, for wildlife, for engineering works, and for town and country planning are discussed.

Management for Crops and Pasture [2]

Some principles of management are general enough to apply to all soils suited to farm crops and pasture throughout Scott County, although individual soils or

[2] Roscoe Issacs, assistant state resource conservationist, Soil Conservation Service, helped prepare this section.

groups of soils require different kinds of management. These general principles of management are discussed in the following paragraphs.

Most soils in the northern part of Scott County are nearly neutral and do not need lime. Most soils are low in nitrogen, some are high in phosphorus, and many are medium in potassium. The amount of lime and fertilizer used should be based on laboratory tests of soil samples, on the needs of specified crops, and on the level of yield desired.

Most soils in this country have never been high in content of organic matter, and to build up the content to a high level is not economical. It is important however, to return organic matter to the soil by adding farm manure, leaving plant residue on the surface, and growing sod crops, cover crops, and green-manure crops.

Tillage tends to break down soil structure. It should be kept to the minimum necessary to prepare a seedbed and control weeds. Maintaining the organic-matter content of the plow layer also helps protect soil structure.

On wet soils such as Newark silt loam, yields of cultivated crops can be increased by open-ditch or tile drainage. Tile drains are expensive to install, but they generally provide better drainage than open ditches. Soils that have a fragipan are difficult to drain and can generally be drained better by open ditches than by tile. Open-ditch drainage is more effective if the ditches intercept the water as it moves horizontally on top of the fragipan. Suitable outlets are needed for both tile and open-ditch drainage.

All of the gently sloping and steeper soils are subject to erosion when cultivated. Runoff and erosion occur mostly while a cultivated crop is growing or soon after harvesting. On erodible soils, such as Lowell silt loam, 6 to 12 percent slopes, a cropping system that controls runoff and erosion is needed in combination with other erosion-control practices. A cropping system means the sequence of crops grown in combination with management practices as minimum tillage, mulch planting, using crop residue, growing cover and green-manure crops, and using lime and fertilizer. Other erosion-control practices are contour cultivation, contour stripcropping, runoff diversions, and grassed waterways. The effectiveness of a particular combination differs from one soil to another, but different combinations can be equally effective on the same soil. The Soil Conservation Service can help in planning an effective combination.

Pasture plants are effective in controlling erosion on all but a few of the soils that are subject to erosion. A high level of pasture management is needed on some soils to provide enough ground cover to keep the soils from eroding. On these soils, fertilization, control of grazing, selection of pasture mixtures, and other practices that help maintain good ground cover and forage for grazing are important. Grazing is controlled by rotating livestock from one pasture to another and providing periods for regrowth after each period. It is important on some soils that pasture mixtures be used that require the least amount of renovation to maintain good ground cover and forage for grazing.

Capability grouping

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

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

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

In the capability system, all kinds of soil are grouped at three levels: the class, the subclass, and the unit. The broadest grouping, the capability class, is designated by Roman numerals I to VIII. In class I are the soils that have the fewest limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and land forms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products. The subclass indicates major kinds of limitations within the classes. Within most of the classes there can be up to 4 subclasses. The subclasses are indicated by adding a small leter, *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" means 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" indicates that the chief limitation is climate that is too cold, or too dry.

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

Subclasses are further divided into groups called capability units. These are groups of soils that are so much alike that they are suited to the same crops and pasture plants, they require about the same management, and have generally similar productivity and other response to management. Capability units are generally identified by numbers assigned locally, for example, IIe-1 or IIIw-1.

The eight classes in the capability system and the subclasses and units in Scott County are described in the list that follows. The capability unit of each soil is listed in the "Guide to Mapping Units."

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

(No subclasses.)

Unit I-1. Nearly level, deep, well drained soils that have a loamy subsoil; on flood plains.

Unit I-2. Nearly level, deep, well drained soils that have a loamy subsoil; on stream terraces.

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

Subclass IIe. Soils subject to moderate erosion if they are cultivated and not protected.

Unit IIe–1. Gently sloping, deep, well drained soils are high in natural fertility.

Unit IIe–2. Gently sloping, deep, well drained soils that are medium in natural fertility.

Unit IIe–3. Gently sloping, moderately well drained soils that have a fragipan.

Subclass IIw. Soils that have moderate limitations because of excess water.

Unit IIw–1. Nearly level, somewhat poorly drained, deep soils that have a loamy subsoil.

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

Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.

Unit IIIe–1. Sloping, deep, well drained soils that are high in natural fertility.

Unit IIIe–2. Sloping, deep, well drained soils that are medium in natural fertility.

Unit IIIe–3. Sloping, moderately deep, well drained soils.

Subclass IIIw. Soils that have severe limitations because of excess water.

Unit IIIw–1. Nearly level, poorly drained soils that have a dark-colored surface.

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

Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.

Unit IVe–1. Moderately steep, moderately deep soils.

Unit IVe–2. Gently sloping to sloping, moderately deep soils that have moderate to low available water capacity.

Class V. Soils that are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, woodland, or wildlife habitat. (None in Scott County.)

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and limit their use largely to pasture, woodland, or wildlife habitat.

Subclass VIe. Soils subject to severe erosion unless close-growing plant cover is maintained.

Unit VIe–1. Moderately steep, moderately deep soils that have moderate to low available water capacity.

Subclass VIs. Soils that have severe limitations because they are shallow.

Unit VIs–1. Moderately steep soils that have a shallow root zone.

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation and restrict their use largely to pasture, woodland, or wildlife habitat.

Subclass VIIe. Soils subject to very severe erosion unless close-growing plant cover is maintained.

Unit VIIe–1. Steep, flaggy, well drained soils that are clayey.

Subclass VIIs. Soils that have very severe limitations because they are shallow.

Unit VIIs–1. Steep to very steep soils that have a shallow root zone.

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

Estimated yields

The estimated average yields per acre of the most common crops in the county are given in table 2. Yields for medium-level management are shown in the A columns and for high-level management in the B columns.

Yields given are the average that can be expected over several years. Yields can be affected adversely by weather, insects, disease, or some other disaster or they can be higher than average because of a combination of good factors.

Comparing the yields in the A columns with those in the B columns shows the difference in yields that can be expected in the two levels of management. No yields for medium-level management are given for tobacco because high-level management is nearly always used.

High-level management includes:

1. Using suitable varieties of plants.
2. Seeding at the proper rate, inoculating legumes, timely planting, and efficient harvesting.
3. Controlling weeds and plant diseases.
4. Fertilizing to or above current recommendations of the University of Kentucky Agricultural Experiment Station or to or above the need shown by soil tests.
5. Liming at the proper rate.
6. Draining wet soils where practical.
7. Using cropping systems that control erosion and maintain soil structure, tilth, and organic-matter content.
8. Using contour tillage, terracing, contour stripcropping, and grassed waterways, as applicable.
9. Using cover crops and crop residues, or both, to increase organic matter and control erosion.
10. Using all applicable pasture-management practices.
11. Using minimum tillage, crop residue management, winter cover crops, and other applicable management practices for crops.

High level management is not the maximum level of management. It is the level that many farmers find practical to reach. It results in the highest sustained production economically feasible.

Medium-level management includes fertilizing and other practices generally considered as the minimum to keep the soil from deteriorating and to produce enough crops for some profit.

Failure to adequately apply one or more of the listed practices for high-level management can cause losses in production and profit or can cause permanent damage to the soil, or both. Inadequate drainage or only partial application of practices to control runoff and erosion are deficiencies in medium-level management.

TABLE 2.—*Estimated average yields per acre of principal crops*

[Yields in the A columns are to be expected under medium-level management; yields in the B columns are to be expected under high-level management. Absence of a figure indicates that the soil is not suited to that particular crop]

Soil	Tobacco	Corn		Wheat		Alfalfa		Grass-legume hay		Annual lespedeza		Tall fescue—legume pasture	
	B	A	B	A	B	A	B	A	B	A	B	A	B
	Lb	*Bu*	*Bu*	*Bu*	*Bu*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days*[1]	*Cow-acre-days*[1]
Ashton silt loam, 0 to 4 percent slopes	3,200	100	140	40	50	4.5	5.5	2.5	3.5	2.0	2.5	170	270
Cynthiana rocky silty clay loam, 12 to 20 percent slopes												60	130
Cynthiana-Rock outcrop complex, 20 to 50 percent slopes												50	100
Dunning silty clay loam, dark subsoil variant		100	120	35	40			3.5	4.0	2.0	2.5	130	220
Eden silty clay loam, 12 to 20 percent slopes						2.5	3.5	2.0	2.5	1.5	2.0	80	160
Eden flaggy silty clay, 20 to 30 percent slopes, severely eroded												60	120
Eden and Faywood silty clay loams, 2 to 12 percent slopes	2,300	60	80	20	25	2.5	3.5	2.0	3.0	1.5	2.0	80	160
Huntington silt loam[2]	3,200	100	135	40	50	4.5	5.0	3.5	4.0	2.0	2.5	170	270
Lowell silt loam, 2 to 6 percent slopes	2,800	80	100	30	40	3.5	4.5	2.5	3.5	1.5	2.0	150	230
Lowell silt loam, 6 to 12 percent slopes	2,500	70	90	25	35	3.5	4.5	2.5	3.5	1.5	2.0	150	230
Lowell-Nolin silt loams, 2 to 10 percent slopes	3,000	90	110	30	40	3.5	4.5	2.5	3.5	1.5	2.0	150	250
Maury silt loam, 2 to 6 percent slopes	3,100	100	110	40	45	4.5	5.0	2.5	3.5	2.0	2.5	170	260
Maury silt loam, 6 to 12 percent slopes	2,900	90	100	35	40	4.0	4.5	2.5	3.5	1.5	2.0	160	240
McAfee silt loam, 6 to 12 percent slopes	2,500	70	80	25	30	3.0	4.0	2.5	3.5	1.5	2.0	140	220
McAfee silt loam, 12 to 20 percent slopes		70	80	20	25	2.5	3.5	2.0	3.0	1.5	2.0	100	180
Newark silt loam[2]		60	110	25	40			2.0	3.5	1.5	2.0	130	250
Nicholson silt loam, 2 to 6 percent slopes	2,900	80	100	30	40	3.5	4.5	2.5	3.5	1.5	2.0	150	240
Nolin silt loam[2]	3,200	90	135	35	45	3.5	5.0	3.5	4.0	2.0	2.5	160	260

[1] Cow-acre days is the number of days that one acre will support one animal unit without injury to the forage plants. An animal unit is one cow, steer, or horse, five hogs, or seven sheep or goats (1,000 pounds live weight).
[2] Damage from flooding is not considered in these estimates.

Woodland [3]

Nearly all of Scott County was covered with hardwood trees when it was first settled. Except for isolated areas and bluffs along the main streams, most of the acreage was cleared for farming.

In the southern part of the county, the soils are mostly gently sloping and high in natural fertility. These soils are still used mainly for farming, but many areas are being developed for urban use. In the northern part of the county the soils are mostly moderately steep or steep. The steeper areas were originally cleared, but have reverted to hardwoods.

The predominant forest types in Scott County include the Redcedar-Hardwood Type and the Oak-Hickory Type on soils such as Cynthiana, Eden, and McAfee soils. The Central Mixed Hardwood Type is associated with such soils as Lowell, Ashton, and Maury soils. The Elm-Ash-Cottonwood Type is found in low-lying areas of Newark, Nolin, and Huntington soils.

According to a Conservation Needs Inventory report, only 14 percent of the county is still classified as forest land. Practically all of this is privately owned. Much of it is in scattered small woodlots which are generally immature, poorly stocked, and heavily grazed. Annual growth for commercial forests averages 22 cubic feet of growing stock and 84 board feet of sawtimber per acre. Five thousand acres are in sawtimber, 7,400 acres are in poletimber, 12,300 acres are in seedlings and saplings, and 700 acres are nonstocked.

Table 3 gives the woodland suitability group for each soil, the potential productivity of each soil, and the management concerns. It also lists the most suitable trees for each soil.

The woodland suitability group is identified by a three-part symbol, such as 1o2, 2o1, 4d1. The potential productivity of the soil is indicated by the first number in the symbol; 1, very high; 2, high, 3, moderately high; 4, moderate; and 5, low. These ratings are based on field determinations of average site index.

The second part of the symbol is a small letter. In this survey *w*, *d*, *c*, and *o* are used. The letter "w" indicates excessive wetness, "d" indicates a restricted rooting depth, and "c" indicates clayey soils. These soil properties impose a hazard or limitation in managing the soil for tree growth. The letter "o" indicates that the soils have few limitations that restrict their use for trees.

The last part of the symbol, another number, differentiates woodland suitability groups that have identical first and second parts in their identifying symbol. Soils in group 1o1, for example, require somewhat different management than soils in group 1o2.

Site index of a given soil is the height, in feet, that the dominant and co-dominant trees, except cottonwood, reach in 50 years. Site index for eastern cottonwood is based on the height reached in 30 years. The average height and age measurements for most species were converted to site index by using site index curves in pub-

[3] CHARLES A. FOSTER, forester, Soil Conservation Service, helped prepare this section.

TABLE 3.—*Woodland*

Soil series and map symbols	Woodland suitability group	Potential productivity			Management concerns	
		Trees	Site index	Average annual growth[1]	Erosion hazard	Equipment limitation
Ashton: AsA	1o2	Upland oak Yellow-poplar	85 95	350 500	Slight	Slight
Cynthiana:						
ChD	4d1	Upland oak Eastern redcedar	55–65 35–45	90–160 ------	Moderate	Moderate
CyF Rock outcrop part of CyF not rated.	4d2	Upland oak Eastern redcedar	55–65 35–45	90–160 ------	Severe	Severe
Dunning: Du	1w2	Lowland oak Sweetgum Eastern cottonwood	95 95 95	450 500 570	Slight	Severe
Eden:						
EdD	3c2	Upland oak Eastern redcedar	65–75 45–55	160–240 ------	Severe	Moderate
EfE3	4c2	Upland oak Eastern redcedar	55–65 37–47	90–160 ------	Severe	Severe
EhB For Faywood part of EhB, see Faywood series.	3c1	Upland oak Eastern redcedar	65–75 45–55	160–240 ------	Moderate	Moderate
Faywood Mapped only with Eden soils.	3c1	Upland oak Eastern redcedar	65–75 45–55	160–240 ------	Moderate	Moderate
Huntington: Hu	1o1	Yellow-poplar Upland oak	95 85	500 350	Slight	Slight
Lowell: LoB, LoC, LwB	2c1	Upland oak Yellow-poplar Eastern redcedar	75–85 85–95 55–65	240–350 380–500 ------	Slight	Slight
Maury: MaB, MaC	2o1	Upland oak Yellow-poplar Eastern redcedar	75–85 85–95 55–65	240–350 380–500 ------	Slight	Slight
McAfee: McC, McD	2c1	Upland oak Eastern redcedar	75–85 55–65	240–320 ------	Slight to moderate.	Slight to moderate.
Newark: Ne	1w1	Lowland oak Eastern cottonwood	95 95	450 570	Slight	Moderate
Nicholson: NfB	2o1	Upland oak Yellow-poplar Eastern redcedar	75–85 85–95 55–65	240–350 380–500 ------	Slight	Slight
Nolin: No	1o1	Yellow-poplar Upland oak	95 85	500 350	Slight	Slight

[1] Average yearly growth is in board feet per acre per year, International ¼ scale.

interpretations of the soils

Management concerns—Con.			Suitable trees—	
Seedling mortality	Plant competition		To favor in existing stands	For planting
	Conifers	Hardwoods		
Slight	Severe	Severe	Yellow-poplar, black walnut, white ash, white oak, black locust, hickory, northern red oak, shumard oak.	Yellow-poplar, black walnut, white ash, black locust, eastern white pine, eastern cottonwood, northern red oak.
Severe	Slight	Slight	White oak, eastern redcedar, black locust, white ash, black oak, scarlet oak, black walnut.	Virginia pine, eastern redcedar, Scotch pine, Austrian pine.
Severe	Slight	Slight	Eastern redcedar, black oak, white oak, hickory, black walnut.	Virginia pine, eastern redcedar, Scotch pine, Austrian pine.
Severe	Severe	Severe	Pin oak, sweetgum, eastern cottonwood, red maple, American sycamore.	Pin oak, sweetgum, American sycamore.
Moderate	Moderate	Slight	Black walnut, white oak, white ash, black oak, hickory, eastern redcedar.	Black locust, eastern redcedar, Virginia pine, Scotch pine, Austrian pine.
Severe	Slight	Slight	Eastern redcedar, sugar maple, scarlet oak, white oak, hickory.	Eastern redcedar, Austrian pine, Virginia pine.
Moderate	Moderate	Slight	White oak, black oak, hickory, eastern redcedar, white ash, black walnut.	Scotch pine, Virginia pine, Austrian pine, black locust, eastern redcedar.
Slight	Moderate	Slight	White oak, black oak, hickory, eastern redcedar, white ash, sugar maple, southern red oak, chinkapin oak.	Shortleaf pine, white ash, eastern white pine, black locust, eastern redcedar, Virginia pine.
Slight	Severe	Severe	Yellow-poplar, black walnut, white ash, white oak, northern red oak.	Yellow-poplar, black walnut, white ash, eastern cottonwood, eastern white pine, shortleaf pine.
Slight	Severe	Moderate	Yellow-poplar, white oak, black oak, hickory, eastern redcedar, white ash, black walnut.	Yellow-poplar, white ash, black walnut, black locust, shortleaf pine, eastern redcedar, eastern white pine, Virginia pine.
Slight	Severe	Moderate	Black walnut, yellow-poplar, white ash, white oak, hickory, black cherry, bur oak, hackberry, black locust.	Black walnut, yellow-poplar, eastern white pine, shortleaf pine, white ash, black locust.
Slight	Moderate	Slight	White oak, black oak, hickory, eastern redcedar, white ash, sugar maple, chinkapin oak, black walnut, yellow-poplar.	Shortleaf pine, white ash, eastern white pine, black locust, eastern redcedar, black walnut, yellow-poplar.
Slight	Severe	Severe	Pin oak, red maple, eastern cottonwood, sweetgum, Shumard oak, green ash.	Eastern cottonwood, sweetgum, sycamore, pin oak, green ash.
Slight	Severe	Moderate	Black walnut, yellow-poplar, white ash, black oak, white oak, hickory.	Black walnut, yellow-poplar, eastern white pine, shortleaf pine, white ash.
Slight	Severe	Severe	Yellow-poplar, black walnut, white ash, white oak, eastern cottonwood, American sycamore, northern red oak.	Yellow-poplar, black walnut, white ash, eastern cottonwood, eastern white pine, sweetgum.

lished research (*4, 5, 6*). Unpublished field studies of 271 plots by the Tennessee Valley Authority were used to determine the site indexes for eastern redcedar.

Site index can be converted into approximate expected average annual growth per acre, in board feet. The conversions of average site index into volumetric growth and yield are based on research data (*7, 8, 9*).

Erosion hazard is the degree of potential soil erosion that can occur following cutting operations and where the soil is exposed along roads, skid trails, fire lanes and landing areas. It is assumed that the woodland is well managed and is protected from fire and grazing. Major soil properties considered in the ratings are slope, permeability, runoff, and surface texture. *Slight* means no special measures are needed; *moderate* means that some measures are needed to control soil erosion; *severe* means that intensive erosion-control measures are needed. Erosion can be kept to a minimum by proper location, construction, and maintenance of roads, trails, fire lanes and landings.

Equipment limitation depends on soil characteristics that restrict or prohibit the use of harvesting equipment either seasonally or continually. Soil properties considered in the ratings are slope, natural drainage, texture of the surface layer, and presence of stones or ledges. *Slight* means no restrictions in the kind of equipment, or time of year equipment is used; *moderate* means that the use of equipment is restricted for 3 months of the year or less; *severe* means that special equipment is needed and its use is severely restricted for more than 3 months of the year.

Seedling mortality refers to mortality of naturally occurring or planted seedlings when plant competition is not a factor. Soil properties considered in the ratings are natural drainage, depth of the root zone, texture of the surface layer, and aspect. *Slight* means a loss of 0 to 25 percent; *moderate* a loss of 25 to 50 percent; and *severe* a loss of more than 50 percent of the seedlings. It is assumed that seed supplies are adequate for natural regeneration.

Plant competition is the degree to which undesirable plants invade an opening in the tree canopy. Considered in the ratings are available water capacity, fertility, flooding, and degree of erosion. Conifers and hardwoods are rated separately in table 3. *Slight* means that plant competition does not prevent adequate natural regeneration and early growth or interfere with seedling development; *moderate* means that competition delays natural or artificial establishment and growth rate, but does not prevent the development of fully stocked normal stands; *severe* means that competition prevents natural or artificial regeneration unless the site is properly prepared and maintained.

Table 3 also lists the suitable species to favor in existing stands and suitable species for planting.

Wildlife Habitat

The kinds of wildlife in an area depend largely on the amount and distribution of food, shelter, and water. Habitat for wildlife can be created or improved by planting suitable vegetation, by properly managing the existing plant cover, by fostering the natural establishment of desirable plants, or by using a combination of these measures (*1*).

In table 4, the soils of Scott County are rated according

TABLE 4.—*Suitability of the soils for elements*

Soil series and map symbols	Elements of wildlife habitat			
	Grain and seed crops	Domestic grasses and legumes	Wild herbaceous plants	Hardwoods
Ashton: AsA	Good	Good	Good	Good
Cynthiana:				
ChD	Poor	Poor	Fair	Poor
CyF	Very poor	Poor	Fair	Poor
Rock outcrop of CyF not rated.				
Dunning: Du	Poor	Fair	Fair	Fair
Eden:				
EdD	Fair	Good	Fair	Fair
EfE3	Poor	Fair	Fair	Fair
EhB	Fair	Good	Fair	Fair
The ratings for EhB are for both Eden and Faywood soils.				
Huntington: Hu	Good	Good	Good	Good
Lowell:				
LoB, LwB	Good	Good	Good	Good
For Nolin part of LwB, see Nolin series.				
LoC	Fair	Good	Good	Good
Maury:				
MaB	Good	Good	Good	Good
MaC	Fair	Good	Good	Good
McAfee:				
McC	Fair	Good	Good	Good
McD	Fair	Good	Good	Good
Newark: Ne	Poor	Fair	Fair	Good
Nicholson: NfB	Fair	Good	Good	Good
Nolin: No	Good	Good	Good	Good

to their suitability for seven elements of wildlife habitat and for three general kinds of wildlife. These ratings can be used as a guide in:

1. Planning parks, refuges, nature-study areas, and other developments for wildlife.
2. Selecting soils for specific kinds of wildlife habitat elements.
3. Determining the intensity of management needed for individual habitat elements.
4. Eliminating sites that would be difficult or not practical to manage for specific kinds of wildlife.
5. Selecting areas suitable for use by wildlife.

Not considered in the ratings are present land use, the location of a soil in relation to other soils, and the mobility of wildlife.

A rating of *good* means that habitat is generally easily created, improved, or maintained. There are few or no limitations in habitat management and satisfactory results can be expected.

Fair means that habitat generally can be created, improved, or maintained, but the soils have moderate limitations that affect their use for wildlife habitat. Management of moderate intensity is needed for satisfactory results.

Poor means that habitat generally can be created, improved, or maintained; but there are severe limitations. Intensive management is needed, which can be difficult and expensive. Satisfactory results are questionable.

Very poor means that it is impractical to create, improve, or maintain habitat because of the very severe limitations. Unsatisfactory results are probable.

The elements of wildlife habitat in table 4 are defined in the following paragraphs. Included with the definitions are the soil properties that affect the use of the soils for these elements of wildlife habitat.

Grain and seed crops include such seed-producing annuals as corn, sorghum, wheat, barley, oats, and other plants commonly grown for grain or for seed. Depth of root zone, available water capacity, natural drainage, slope, surface stoniness, hazard of flooding, and texture of the surface layer are important.

Domestic grasses and legumes are domestic perennial grasses and herbaceous legumes that are established by planting to furnish wildlife cover and food. Among the plants are bluegrass, fescue, brome, timothy, orchardgrass, reed canarygrass, clover, and alfalfa. Depth of root zone, available water capacity, natural drainage, slope, surface stoniness, hazard of flooding, and texture of the surface layer are important.

Wild herbaceous plants are native or introduced perennial grasses and weeds that generally are established naturally. They include broomsedge, quackgrass, switchgrass, goldenrod, wild carrot, and dandelion. They provide food and cover mostly for upland wildlife. Depth of root zone, available water capacity, natural drainage, surface stoniness, hazard of flooding or ponding, and texture of the surface layer are important.

Hardwoods are nonconiferous trees, shrubs, and woody vines that produce nuts or other fruits, buds, catkins, twigs, or foliage that wildlife eat. They generally are established naturally but can be planted. Among the native kinds are oak, cherry, maple, poplar, papaw, hawthorn, dogwood, persimmon, sumac, sassafras, hazelnut, black walnut, hickory, sweetgum, redhaw, wild grapes, and blackberry briers. Depth of root zone, available water

of wildlife habitat and kinds of wildlife

Elements of wildlife habitat—Con.			Openland wildlife	Woodland wildlife	Wetland wildlife
Conifers	Wetland plants	Shallow water areas			
Good	Poor	Very poor	Good	Good	Very poor.
Poor	Very poor	Very poor	Poor	Poor	Very poor.
Poor	Very poor	Very poor	Poor	Poor	Very poor.
Fair	Good	Good	Fair	Fair	Good.
Fair	Very poor	Very poor	Fair	Fair	Very poor.
Fair	Very poor	Very poor	Poor	Fair	Very poor.
Fair	Poor	Very poor	Fair	Fair	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Very poor	Very poor	Good	Good	Very poor.
Good	Fair	Fair	Fair	Good	Fair.
Good	Poor	Very poor	Good	Good	Very poor.
Good	Poor	Very poor	Good	Good	Very poor.

capacity, and natural drainage are important.

Also in this group are several varieties of fruiting shrubs that are raised commercially for planting. Autumn-olive, honeysuckle, crabapple, and multiflora are some shrubs that generally are available and can be planted on soils that are rated good. Hardwoods that are not available commercially can commonly be transplanted successfully.

Conifers are cone-bearing evergreen trees and shrubs that primarily provide cover for wildlife. They also provide browse and seeds or fruitlike cones. Generally redcedar grows naturally in areas where the cover of weeds and sod is thin, but many kinds of pine trees can be planted. Depth of root zone, available water capacity, and natural drainage are important.

Wetland plants are wild, herbaceous, annual and perennial plants that grow on moist to wet sites. They do not include submerged or floating aquatics. They produce food and cover for wetland wildlife. They include smartweed, rushes, sedges, barnyard grass, arrowhead, and cattails. Natural drainage, surface stoniness, slope, and texture of the surface layer are important.

Shallow water areas are generally not more than 5 feet deep and are near food and cover for wetland wildlife. They are natural wet areas or have been created by dams or levees, or by water-control devices in marshes or streams. Wildlife ponds, beaver ponds, muskrat marshes, waterfowl feeding areas, and wildlife watering areas are examples. Depth to bedrock, natural drainage, slope, surface stoniness, and permeability are important. Natural wet areas that are aquifer fed are rated on the basis of drainage class without regard to permeability. Permeability applies only to those non-aquifer areas that have a potential for development, and water is assumed to be available offsite.

The ratings for kinds of wildlife in table 4 are based on the ratings for the elements of wildlife habitat. The kinds of wildlife are defined in the following paragraphs.

Openland wildlife are birds and mammals that normally make their home in areas of crops, pasture, meadow, and lawns and in areas overgrown with grasses, herbs, shrubs, and vines. Examples are quail, meadowlark, field sparrow, dove, cottontail, red fox, and groundhog.

Woodland wildlife are birds and mammals that obtain food and cover in stands of hardwoods, coniferous trees, shrubs, or a mixture of these plants. Woodcock, thrush, vireo, scarlet tanager, gray squirrels, fox squirrels, gray fox, white-tailed deer, and raccoon are examples.

Wetland wildlife are birds and mammals that normally make their home in wet areas such as ponds, marshes, and swamps. Ducks, geese, rails, herons, shore birds, and muskrat are examples.

Engineering Uses of the Soils [4]

This section is useful to planning commissions, town and city managers, land developers, engineers, contractors, farmers, and others who need information about soils used as structural material or as foundation on which structures are built.

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

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

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

Most of the information in this section is presented in tables. Table 5 shows estimated soil properties significant in engineering. Table 6 gives interpretations for various engineering uses. Table 7 shows the results of engineering laboratory tests on soil samples.

This information, along with the soil map and data in other parts of this publication, can be used to make interpretations in addition to those given in tables 5 and 6, and it also can be used to make useful maps.

This information, however, does not eliminate the need for further investigation at sites selected for engineering works, especially works that involve heavy loads or that require excavations to a depth more than that shown in the tables, generally a depth of more than 5 feet. Also, grained soils, identified as ML, CL, OL, MH, CH, and many delineated areas of a given soil can include small areas of other kinds of soil that have strongly contrasting properties and different suitability or limitations for soil engineering.

Some of the terms used in this soil survey have special meaning to soil scientists. The Glossary defines many of the terms commonly used in soil science.

Engineering soil classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system (*3*) used by SCS engineers, the Department of Defense, and others, and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*2*).

In the Unified system, soils are classified according to particle-size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-inspection of sites, especially small ones, is needed because

[4] ARTHUR SMITH, area engineer, Soil Conservation Service, helped prepare this section.

OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes, for example, CL–ML.

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

Soil properties significant in engineering

Several estimated soil properties significant in engineering are given in table 5. These estimates are made for typical soil profiles, by layers sufficiently different to have different significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the column headings in table 5.

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

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

Soil texture is described in table 5 in the standard terms used by the Department of Agriculture. These terms take into account relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loamy sand." "Sand," "silt," "clay," and some of the other terms used are defined in the Glossary of this soil survey.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from semi-solid to plastic. If the moisture content is further increased, the material changes from plastic to liquid. The plastic limit is the moisture content at which the soil material changes from semisolid to plastic; and the liquid limit, from plastic to liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic. Liquid limit and plasticity index are estimated in table 5, but in table 7 the data on liquid limit and plasticity index are based on tests of soil samples.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on the basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 5 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

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

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

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

Engineering interpretation of the soils

The estimated interpretations in table 6 are based on the engineering properties of soils shown in table 5, on test data for soils in this survey area and others nearby or adjoining, and on the experience of engineers and soil scientists with the soils of Scott County. In table 6, ratings are used to summarize suitability of the soils for topsoil and road fill. For other uses, table 6 lists those soil features not to be overlooked in planning installation and maintenance. Following are explanations of the columns in table 6.

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

Road fill is soil material used in embankments for roads. The suitability ratings reflect the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage (fig. 9) and the relative ease of excavating the material at borrow areas.

Soil properties that most affect highway location are the load-supporting capacity and stability of the subgrade and the workability and quantity of cut and fill material available. The AASHTO and Unified classifications of the soil material and the shrink-swell potential indicate traffic-supporting capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect ease of excavation and amount of cut and fill needed to reach an even grade.

TABLE 5.—*Estimated soil properties*

[An asterisk in the first column indicates that at least one mapping unit in that series is made up of two or more kinds of soil. The the first column. The symbol > means

Soil series and map symbols	Depth to— Bedrock	Depth to— Seasonal high water table	Depth from surface	USDA texture	Classification Unified[1]	Classification AASHTO[1]	Coarse fraction larger than 3 inches
	Feet	*Feet*	*Inches*				*Percent*
Ashton: AsA	>4	[3] >5	0–20	Silt loam	ML or CL	A–4	
			20–52	Silt loam or silty clay loam.	CL or ML	A–6 or A–4	
			52–60	Silt loam	CL or ML	A–6 or A–4	0–5
Cynthiana: ChD, CyF. Rock outcrop part of CyF not rated.	1–1½	>5	0–5	Silty clay loam	CL or CH	A–7	5–30
			5–18	Silty clay	CH, MH, or CL	A–7	10–30
Dunning: Du	>3½	[4] 0–½	0–16	Silty clay loam	CL or ML	A–6 or A–4	
			16–54	Silty clay	CL, CH, or MH	A–7	
*Eden: EdD, EfE3, EhB. For Faywood part of EhB, see Faywood series.	1½–3½ (Rippable)	>5	0–5	Silty clay loam	CL, CH, or MH	A–7 or A–6	0–20
			5–26	Silty clay or shaly silty clay.	MH, ML, or CH	A–7 or A–5	10–30
			26–38	Shaly clay	MH, CL, or CH	A–7	20–40
Faywood. Mapped only with Eden soils.	1½–3½	>3½	0–7	Silty clay loam	CL or ML	A–6	0–10
			7–34	Silty clay	CH, MH, or CL	A–7	0–10
Huntington: Hu	>4	[4] >3	0–60	Silt loam	ML or CL	A–4 or A–6	0–5
*Lowell: LoB, LoC, LwB. For Nolin part of LwB, see Nolin series.	>3½	>5	0–7	Silt loam	ML or CL	A–4 or A–6	
			7–23	Silty clay loam	CL, ML, or CH	A–7, A–6, or A–5	
			23–60	Silty clay and clay	CH, MH, or CL	A–7	
Maury: MaB, MaC	>5	>5	0–16	Silt loam	ML or CL	A–4, A–5, or A–6	0–1
			16–21	Silty clay loam	CL or ML	A–4 or A–6	0–1
			21–29	Silty clay loam	CL, ML, CH, or MH	A–6 or A–7	0–1
			29–75	Silty clay or clay	CH, MH, or CL	A–7	0–1
McAfee: McC, McD	1½–3½	>3½	0–7	Silt loam	ML or CL	A–4 or A–6	0–10
			7–13	Silty clay loam	CL or MH	A–6 or A–7	0–10
			13–32	Silty clay	CH, MH, or CL	A–7	1–20
Newark: Ne	>4	[4] ½–1½	0–36	Silt loam	ML or CL	A–4 or A–6	
			36–60	Silty clay loam	CH or ML	A–6 or A–4	
Nicholson: NfB	>5	1½–2½	0–7	Silt loam	ML or CL	A–4 or A–6	
			7–21	Silty clay loam	CL or ML	A–6 or A–4	
			21–34	Silty clay loam (fragipan).	CL or ML	A–6 or A–4	
			34–60	Silty clay or clay	CH, MH, or CL	A–7	
Nolin: No	4	[4] 3	0–60	Silt loam	ML or CL	A–4 or A–6	0–5

[1] Estimates based on 100 percent passing the 3-inch sieve.
[2] Liquid limit is expressed as the percentage of dry soil. When a soil has a liquid limit of 100, the weight of the moisture equals the weight of the dry soil.
[3] Subject to rare flooding.

significant in engineering

soils in such mapping units may have different properties, and for this reason it is necessary to refer to other series as indicated in more than; the symbol < means less than]

Percentage smaller than 3 inches passing sieve—				Liquid limit [2]	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.74 mm)						
				Percent		*Inches per hour*	*Inches per inch of soil*	pH	
95–100	95–100	90–100	75–90	25–35	5–10	0.6–2.0	0.19–0.23	5.6–7.3	Low.
95–100	95–100	90–100	80–95	30–40	5–20	0.6–2.0	0.18–0.22	5.6–7.3	Low.
90–100	85–100	80–95	70–90	30–40	5–20	0.6–2.0	0.16–0.20	5.6–7.3	Low.
85–95	85–95	80–95	70–90	40–55	20–30	0.6–2.0	0.15–0.20	6.1–7.3	Moderate.
85–95	80–95	80–95	75–90	48–70	20–40	0.2–0.6	0.10–0.15	6.1–7.8	Moderate.
100	95–100	90–100	85–95	25–40	10–20	0.6–2.0	0.19–0.22	6.1–7.8	Low.
95–100	95–100	95–100	90–95	45–60	20–30	<0.2	0.14–0.18	6.1–7.8	Moderate.
80–100	75–100	75–95	70–95	35–55	15–25	0.2–0.6	0.14–0.18	6.1–8.4	Moderate.
70–90	70–90	70–90	70–85	40–65	7–35	<0.2	0.10–0.15	6.1–8.4	Moderate.
65–100	60–100	60–100	60–95	45–65	20–35	<0.2	0.06–0.12	7.4–8.4	Moderate.
90–100	90–100	90–100	80–95	30–40	15–20	0.6–2.0	0.17–0.21	5.6–7.3	Low.
90–100	90–100	90–100	85–95	48–65	25–35	2.0–6.0	0.12–0.17	5.6–7.3	Moderate.
95–100	85–100	85–95	70–90	25–35	5–15	0.6–2.0	0.18–0.23	6.1–7.8	Low.
95–100	95–100	90–100	85–95	25–40	5–15	0.6–2.0	0.19–0.23	5.1–6.5	Low.
95–100	95–100	95–100	85–95	40–60	9–30	0.2–0.6	0.15–0.20	5.1–6.5	Moderate.
95–100	95–100	95–100	90–95	45–70	25–40	0.2–0.6	0.13–0.17	5.1–6.5	Moderate.
95–100	95–100	85–100	70–90	25–40	5–15	0.6–6.0	0.19–0.23	5.1–7.3	Low.
95–100	95–100	90–100	80–95	30–40	10–20	0.6–6.0	0.18–0.22	5.1–6.5	Low.
95–100	95–100	90–100	85–95	35–60	15–30	0.6–2.0	0.18–0.20	5.1–6.0	Low.
95–100	95–100	90–100	85–95	30–70	15–35	0.6–2.0	0.14–0.18	5.1–6.0	Low.
90–100	85–100	75–95	70–90	25–40	5–15	0.6–2.0	0.18–0.23	5.6–7.3	Low.
90–100	85–100	80–100	75–95	35–60	15–25	0.6–2.0	0.13–0.22	5.6–6.5	Moderate.
80–99	75–100	75–100	70–95	45–70	25–35	0.2–0.6	0.11–0.18	5.6–6.5	Moderate.
95–100	95–100	90–100	75–90	25–35	5–15	0.6–2.0	0.19–0.23	6.1–7.8	Low.
95–100	95–100	95–100	85–95	25–50	12–20	0.6–2.0	0.18–0.22	6.1–7.8	Low.
95–100	95–100	90–100	80–90	25–40	5–15	0.6–2.0	0.19–0.23	4.5–7.3	Low.
95–100	95–100	90–100	80–95	30–40	5–20	0.6–2.0	0.18–0.22	4.5–6.5	Low.
95–100	95–100	80–100	75–95	30–40	10–20	<0.2	[5] 0.09–0.12	4.5–6.0	Low.
95–100	95–100	60–100	55–95	45–70	10–35	<0.2	[5] 0.09–0.12	4.5–7.8	Moderate.
95–100	80–100	80–95	70–90	25–35	5–20	0.6–2.0	0.18–0.23	6.1–7.8	Low.

[4] Subject to common flooding.
[5] Available water capacity estimate was reduced because of the fragipan.

TABLE 6.—*Interpretations of*

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

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Farm ponds: Reservoir areas
Ashton: AsA	Good	Fair: A–4 or A–6 material; medium strength.	Subject to rare flooding.	Moderate permeability
Cynthiana: ChD, CyF. No interpretations made for Rock outcrop part of CyF.	Poor: 10 to 30 percent coarse fragments; moderately steep to very steep slopes; clayey subsoil.	Poor: A–7 material; moderately steep to very steep slopes; shallow to rock.	Bedrock at a depth of 1 foot to 1½ feet; moderately steep to very steep slopes; plastic subsoil.	Creviced limestone bedrock at a depth of 1 foot to 1½ feet may allow seepage; moderately steep to very steep slopes.
Dunning: Du	Poor: poorly drained.	Poor: A–6 or A–7 material; low strength; poorly drained.	Subject to flooding; seasonal water table within ½ foot of the surface; plastic subsoil.	Creviced limestone bedrock may allow seepage.
*Eden:				
EdD, EfE3	Poor: 10 to 35 percent coarse fragments; moderately steep to steep slopes; clayey subsoil.	Poor: A–7 material; low strength; some steep slopes.	Hazard of slipping in some areas; highly erodible; moderately steep to steep; plastic subsoil.	Thin limestone layer may allow seepage; moderately steep to steep.
EhB. For Faywood part of EhB, see Faywood series.	Poor: 10 to 35 percent coarse fragments; clayey subsoil.	Poor: A–7 material; low strength.	Hazard of slipping in some areas; highly erodible; plastic subsoil.	Thin limestone layer may allow seepage.
Faywood. Mapped only with Eden soils.	Poor: clayey subsoil; 0 to 10 percent coarse fragments; slope.	Poor: A–7 material; low strength.	Bedrock at a depth of 1½ to 3½ feet; plastic subsoil.	Creviced limestone bedrock at a depth of 1½ to 3½ feet may allow seepage.
Huntington: Hu	Good	Fair: A–4 or A–6 material; medium strength.	Subject to flooding	Moderate permeability
*Lowell:				
LoB	Fair: silty clay loam subsoil.	Poor: A–7 material; low strength.	Plastic subsoil	Creviced limestone bedrock may allow seepage.
LoC	Fair: silty clay loam subsoil; slope.	Poor: A–7 material; low strength.	Highly erodible; plastic subsoil.	Creviced limestone bedrock may allow seepage.
LwB. For Nolin part, see Nolin series.	Fair: silty clay loam subsoil; loam subsoil; slope.	Poor: A–7 material; low strength.	Subject to flooding in some areas; subject to hillside creep; plastic subsoil.	Subject to buried layers of porous material.
Maury: MaB, MaC	Good for MaB. Fair for MaC: slope.	Fair in upper 18 inches: A–4 or A–6 material; moderate strength. Poor below a depth of 21 inches: A–6 or A–7 material; low strength.	All features favorable	Moderate permeability; cavernous limestone bedrock.
McAfee:				
McC	Fair: 0 to 15 percent coarse fragments; slope; silty clay loam subsoil.	Poor: A–6 or A–7 material; low strength.	Bedrock at a depth of 1½ to 3½ feet.	Cavernous limestone bedrock at a depth of 1½ to 3½ feet.
McD	Poor: moderately steep slopes.	Poor: A–6 or A–7 material; low strength.	Bedrock at a depth of 1½ to 3½ feet; moderately steep slopes.	Cavernous limestone bedrock at a depth of 1½ to 3½ feet; moderately steep slopes.
Newark: Ne	Good	Fair in upper part: A–4 or A–6 material; medium strength; somewhat poorly drained. Poor below a depth of 36 inches: A–6 or A–7 material.	Subject to flooding; seasonal water table within ½ foot to 1½ feet of surface.	Moderate permeability

engineering properties of the soils

soils in such mapping units may have different properties and limitations, and for this reason it is necessary to refer to other series the first column]

Soil features affecting—Con.				
Farm ponds—con.				
Embankments and dikes	Drainage for crops and pasture	Sprinkler irrigation	Terraces and diversions	Grassed waterways
Medium strength	Well drained	All features favorable	All features favorable	All features favorable.
Low strength; hard to compact; thin layer; compressible.	Well drained to somewhat excessively drained.	Shallow root zone; moderately steep to very steep slopes.	Moderately steep to very steep slopes; bedrock at a depth of 1 foot to 1½ feet.	Moderately steep to very steep slopes; shallow root zone.
Compressible; hard to compact; low strength.	Subject to flooding; seasonal water table within ½ foot of surface.	Subject to flooding; slow permeability; seasonal water table within ½ foot of the surface.	Nearly level; seasonal water table within ½ foot of the surface; slow permeability; subject to flooding.	Poorly drained.
Low strength; hard to compact; thin layer; compressible.	Well drained	Slow permeability; highly erodible; moderately steep to steep.	Moderately steep to steep; channel highly erodible; slow permeability.	Highly erodible; moderately steep to steep.
Low strength; hard to compact; thin layer; compressible.	Well drained	Slow permeability; highly erodible.	Channel highly erodible; slow permeability.	Highly erodible.
Low strength; thin layer; compressible.	Well drained	Moderately deep root zone; moderately slow permeability; highly erodible.	Channel highly erodible; moderately slow permeability; bedrock at a depth of 1½ to 3½ feet.	Highly erodible.
Subject to piping	Well drained	Subject to flooding	Subject to flooding; nearly level.	All features favorable.
Low strength; compressible.	Well drained	Moderately slow permeability.	Channel highly erodible; moderately slow permeability.	Highly erodible.
Low strength; compressible.	Well drained	Moderately slow permeability.	Channel highly erodible; moderately slow permeability.	Highly erodible.
Low strength; compressible.	Well drained; subject to flooding.	Subject to flooding in some areas; moderately slow permeability.	Channel highly erodible; moderately slow permeability.	Highly erodible.
Low strength	Well drained	All features favorable	All features favorable	All features favorable.
Low strength; thin layer; compressible.	Well drained	Moderately deep root zone; moderately slow permeability.	Bedrock at a depth of 1½ to 3½ feet.	All features favorable.
Low strength; thin layer; compressible.	Well drained	Moderately deep root zone; moderately slow permeability; highly erodible.	Bedrock at a depth of 1½ to 3½ feet; moderately steep slopes.	Moderately steep slopes; highly erodible.
Subject to piping	Subject to flooding; seasonal water table within ½ to 1½ feet of surface.	Subject to flooding; seasonal water table within ½ to 1½ feet of surface.	Nearly level; seasonal water table within ½ to 1½ feet of surface; subject to flooding.	Somewhat poorly drained.

TABLE 6.—*Interpretations of engineering*

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Farm ponds: Reservoir areas
Nicholson: NfB	Good	Poor below a depth of 36 inches: A–6 or A–7 material; low strength.	Perched seasonal water table at a depth of 1½ to 2½ feet; plastic material below a depth of 36 inches.	Creviced limestone bedrock may allow seepage.
Nolin: No	Good	Fair: A–4 or A–6 material; medium strength.	Subject to flooding	Moderate permeability

Figure 9.—Eden soil material is subject to slippage when used as road fill as indicated by the misalignment of the guard posts.

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

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

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

Sprinkler irrigation is affected by soil features such as slope; susceptibility to stream overflow, water erosion, or soil blowing; texture; content of stones; accumulation of salts and alkali; depth of the root zone; rate of water intake at the surface; permeability below the surface layer and in fragipans or other layers that restrict movement of water; amount of water held available to plants; and need for drainage, or depth to water table or bedrock.

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

Grassed waterway layout and construction are affected by such soil properties as texture, depth, and erodibility of the soil material; stones or Rock outcrop; and the steepness of slopes. Other factors affecting grassed waterways are seepage, drainage, available water capacity, susceptibility to siltation, and the ease of establishing and maintaining vegetation.

Soil test data

Table 7 contains engineering test data for some of the major soil series in Scott County. The tests were made *properties of the soils*—Continued

Soil features affecting—Con.				
Farm ponds—con. Embankments and dikes	Drainage for crops and pasture	Sprinkler irrigation	Terraces and diversions	Grassed waterways
Low strength below a depth of about 36 inches.	Perched seasonal water table at a depth of 1½ to 2½ feet; slow permeability in fragipan.	Slow permeability; perched seasonal water table and fragipan at a depth of 1½ to 2½ feet.	Slow permeability; perched seasonal water table at a depth of 1½ to 2½ feet.	Highly erodible; seepage on side slopes.
Subject to piping	Well drained	Subject to flooding	Subject to flooding; nearly level.	All features favorable.

to help evaluate the soils for engineerng purposes. The soil profiles from which the tested samples were taken are described in the section "Laboratory Data."

The engineering classifications are based on data obtained by mechanical analyses and by tests to determine liquid limit and plastic limit. The mechanical analyses were made by combined sieve and hydrometer methods.

Moisture-density (or compaction) data are important in earthwork. If a soil material is compacted at successively higher moisture contents, assuming that the compactive effort remains constant, the density of the compacted material increases until the *optimum moisture content* is reached. After that, density decreases with increase in moisture content. The highest dry density obtained in the compactive test is termed *maximum dry density*. As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

California bearing ratio (CBR) data is used to evaluate the bearing value of soil material. A piston is forced into a compacted sample. The amount of penetration is compared to pressure on a "standard" well graded crushed stone. The bearing value of the sample is determined for a specific penetration by dividing the load for that penetration by the standard load for the same penetration. The resulting CBR value is expressed as a percentage.

Tests to determine liquid limit and plastic limit measure the effect of water on the consistence of soil material, as has been explained for table 5.

Town and Country Planning

This section provides information on the properties of soils and their effect on selected nonfarm uses. Community planners, developers, and individual land owners can determine the most suitable use for a particular area. Other useful information can be found in "Descriptions of the Soils" and "Engineering Uses of the Soils."

Although the soil maps and tables serve as a guide and can eliminate some sites from further considerations, detailed onsite investigation is necessary when a development is being planned. Not considered in this section are location in relation to established business centers or transportation lines and other economic factors that are important and often determine the ultimate use of an area.

Table 8 gives the estimated degree and kinds of limitations for some selected uses. These limitations are expressed as *slight*, *moderate*, or *severe* and are based on the degree of the greatest single limitation. For example, if flooding severely limits the use of a soil in the disposal of sewage effluent from septic tanks, the limitation is *severe*, though the soil is well suited to that use in all other respects.

Slight indicates that the soil has properties favorable for the rated use. Soil limitations are minor and can be easily overcome. Good performance and low maintenance can be expected on the soil. *Moderate* indicates that the soil has properties moderately favorable for the rated use. The limitations can be overcome or modified with special planning, design, or maintenance. During some seasons of the year the performance of the structure or other planned use may be somewhat less desirable than for soils that have only slight limitations. *Severe* indicates that the soil has one or more unfavorable properties for the given use. Limitations are difficult and costly to modify or overcome, and major soil reclamation, special design, or intense maintenance is required. Some soils that have severe limitations can be improved by reducing or removing the soil feature that limits its use. In most situations it is difficult and costly to alter the soil or design a structure to compensate for severe soil limitations.

The kinds of limitations, expressed in terms of soil characteristics or properties, are given only if the limitation is moderate or severe. Some terms are not in a standard dictionary or have a special meaning. These are defined in the Glossary in the back of this survey.

Following are explanations of some of the columns in table 8.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material from a depth of 18 inches to 5 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability, natural drainage, depth to water table or rock, and susceptibility to flood-

TABLE 7—*Engineering*

[Tests performed by the Division of Research, Bureau of Highways, Kentucky Department of Transportation, Lexington, Kentucky, reau of

Soil name and location	Parent material	Depth	Horizon	Moisture-density [1]		California bearing ratio data [2]		Specific gravity
				Maximum dry density	Optimum moisture	Unsoaked	Soaked	
		Inches		*Pounds per cubic foot*	*Percent*	*Percent*	*Percent*	
Eden silty clay loam: 0.1 mile east of Interstate Highway 75 and 0.7 mile north of Rogers Gap Road; about 7 miles north of Georgetown. Laboratory No. S72KY-105-1.	Residuum of interbedded soft calcareous shale and siltstone and thin interbedded limestone.	13–24 36–53	B23t B32t	107 97	18 25	30 ------	2 ------	2.76 2.75
Lowell silt loam: 200 feet northwest of large barn, 0.6 mile north of U.S. Highway 227, 1.2 mile northeast of Newtown, and about 6 miles east of Georgetown. Laboratory No. S72KY-105-3.	Residuum of interbedded limestone, calcareous shale, and siltstone.	13–23 37–45	B21t B24t	103 90	20 27	35 21	11 3	2.68 2.77
Lowell silt loam: 500 feet southwest of main barn on Robert McMillan farm, 0.2 mile north of Leesburg Road, 3.4 miles northeast of Newtown, and about 7.5 miles north of Georgetown. Laboratory No. S72KY-105-4.	Residuum of interbedded limestone, calcareous shale, and siltstone.	18–28 35–44	B22t B24t	108 92	20 29	22 ------	12 ------	2.66 2.82
Maury silt loam: 1.2 miles south of Newtown and 0.7 mile southeast of right angle turn of county road, about 5.4 miles east of Georgetown. Laboratory No. S72KY-105-5.	Silty material over residuum from phosphatic limestone.	25–35 53–66	B22t B25t	104 104	21 23	18 20	9 9	2.67 2.65
Maury silt loam: 750 feet east of farmhouse and 1.2 miles east of Interstate Highway 75; 0.4 mile north of U.S. Highway 277 and about 3 miles east of Georgetown. Laboratory No. 72KY-105-6.	Silty material over residuum from phosphatic limestone.	8–16 29–36	A-3 B22t	97 101	22 24	33 11	12 8	2.59 2.66
Nicholson silt loam: 500 feet north of farmhouse, 0.7 mile north of U.S. Highway 277, 1.3 miles northeast of Newtown, and about 6.1 miles east of Georgetown. Laboratory No. S72KY-105-7.	Loess or silty alluvium over residuum of limestone, calcareous shale, and siltstone.	8–18 18–26 34–49	B2t Bx1 IIB22t	106 107 92	19 20 27	------ 40 ------	------ 14 ------	2.71 2.72 2.76
Nicholson silt loam: 100 feet southwest of main barn and 0.25 mile west of Leesburg-Newtown Road; 3.3 miles northeast of Newtown and about 7.4 miles northeast of Georgetown. Laboratory No. S72KY-105-8.	Loess or silty alluvium over residuum of limestone, calcareous shale, and siltstone.	14–21 28–46 46–70	B21t Bx1 B23t	108 106 103	20 19 23	14 30 ------	10 14 ------	2.67 2.72 2.75

[1] Based on AASHTO Designation T99-70 Method A (2).
[2] Based on Kentucky Bureau of Highways method.
[3] Based on AASHTO Designation T88-70 (2).

ing. Slope affects layout and construction and also the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs. Possible pollution of water sources by effluent seeping through caverns and crevices in the underlying limestone is not considered in the ratings, but it is a severe limitation in places in the southern part of Scott County.

Sewage lagoons are shallow ponds constructed to hold sewage within a depth of 2 to 5 feet, long enough for bacteria to decompose the solids. A lagoon has a nearly level floor; its sides, or embankments, are of soil material compacted to medium density. Properties that affect the pond floor are permeability, content of organic matter, and slope, and if the floor needs to be leveled, depth to bedrock becomes important. The soil properties that affect the embankment are the engineering properties of *test data*

according to standard procedures of the American Association of State Highway and Transportation Officials and the Kentucky Bu-
Highways]

Mechanical analysis [3]												Liquid limit	Plasticity index	Classification	
Percentage passing siéve—								Percentage smaller than—							
1½ inches	1 inch	¾ inch	⅜ inch	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)	0.05 mm	0.02 mm	0.005 mm	0.002 mm			AASHTO [4]	Unified [5]
												Percent			
97	94	90	82	72	72	71	69	64	59	40	29	41	7	A-5(5)	ML
-----	100	99	98	98	98	98	95	85	81	61	51	58	18	A-7-5(24)	MH
-----	------	------	------	------	100	94	90	87	79	48	37	44	9	A-5(11)	ML
95	90	89	86	85	85	82	77	72	67	54	47	63	16	A-7-5(17)	MH
99	99	99	99	96	96	86	82	77	69	40	29	30	17	A-6(12)	CL
-----	------	------	------	------	100	99	93	88	81	65	57	65	21	A-7-5(27)	MH
-----	------	------	100	98	98	91	89	83	80	47	39	47	14	A-7-5(16)	ML
-----	------	------	------	100	100	89	88	81	78	49	38	28	18	A-6(13)	CL
-----	------	------	------	------	100	96	93	88	77	34	21	41	8	A-5(10)	ML
-----	------	------	------	------	100	93	90	85	74	49	32	51	17	A-7-5(19)	MH-ML
-----	------	------	100	97	97	90	87	83	75	41	32	37	8	A-4(8)	ML
-----	------	------	100	98	98	82	75	68	59	37	26	40	10	A-4(8)	ML
100	92	87	77	68	68	62	57	49	45	34	28	64	19	A-7-5(10)	MH
-----	------	------	------	------	100	94	90	85	77	42	32	35	7	A-4(7)	ML
-----	------	------	------	------	100	94	89	83	77	45	34	37	12	A-6(12)	CL-ML
-----	------	------	------	------	100	94	89	85	80	55	45	51	13	A-7-5(16)	MH-ML

[4] Based on AASHTO Designation M145-73 (*2*).
[5] Based on the Unified Soil Classification System (*3*).

the embankment material as interpreted from the Unified soil classification and the amounts of stones, if any, that influence the ease of excavation and compaction of the embankment material. Susceptibility to flooding is also considered in the ratings.

In trench-type sanitary landfills, thin layers of refuse are spread in dug trenches, compacted, and covered with soil material. Landfills are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfills are ease of excavation, hazard of polluting groundwater, and trafficability. The best soils have moderately slow permeability, withstand heavy traffic, and are friable and easy to excavate. Other properties considered are natural drainage, susceptibility to flooding, slope, depth to bedrock, and content of stones and rocks. Unless otherwise stated, the ratings in table 8 apply only

TABLE 8.—*Degree and kind of limitation*

Soil series and map symbols	Septic tank absorption fields	Sewage lagoons	Sanitary landfill[1]			Shallow excavations
			Trench type	Area type	Cover material	
Ashton: AsA	Moderate: subject to rare flooding.[2]	Moderate: subject to rare flooding[2]; moderate permeability.	Moderate: subject to rare flooding[2].	Moderate: subject to rare flooding.[2]	Slight	Slight
Cynthiana:						
ChD	Severe: slope; bedrock at a depth of 1 foot to 1½ feet.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet.	Severe: bedrock at a depth of 1 foot to 1½ feet.	Severe: slope	Severe: slope; bedrock at a depth of 1 foot to 1½ feet.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet.
CyF. Rock outcrop part not rated.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet; rock outcrops.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet; rock outcrops.	Severe: slope	Severe: slope; bedrock at a depth of 1 foot to 1½ feet; rock outcrops.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet; rock outcrops.
Dunning: Du	Severe: poorly drained; slow permeability; subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; poorly drained.	Severe: subject to flooding; poorly drained.	Severe: poorly drained.	Severe: subject to flooding; poorly drained.
Eden:						
EdD	Severe: slow permeability; slope; rippable rock at a depth of 1½ to 3½ feet.	Severe: slope; rippable rock at a depth of 1½ to 3½ feet.	Severe: rippable rock at a depth of 1½ to 3½ feet.	Severe: slope	Severe: slope	Severe: slope; rippable rock at a depth of 1½ to 3½ feet.
EfE3	Severe: slow permeability; slope; flaggy; rippable rock at a depth of 1½ to 3½ feet.	Severe: slope; rippable rock at a depth of 1½ to 3½ feet.	Severe: slope; rippable rock at a depth of 1½ to 3½ feet.	Severe: slope	Severe: slope	Severe: slope; flaggy; rippable rock at a depth of 1½ to 3½ feet.
EhB. For Faywood part, see Faywood series.	Severe: slow permeability; rippable rock at a depth of 1½ to 3½ feet.	Severe: slope; rippable rock at a depth of 1½ to 3½ feet.	Severe: rippable rock at a depth of 1½ to 3½ feet.	Moderate: slope.	Moderate: slope; silty clay subsoil; rippable rock at a depth of 1½ to 3½ feet.	Severe: rippable rock at a depth of 1½ to 3½ feet.
Faywood. Mapped only with Eden soils.	Severe: Moderately slow permeability; slope; bedrock at a depth of 1½ to 3½ feet.	Severe: slope; bedrock at a depth of 1½ to 3½ feet.	Severe: bedrock at a depth of 1½ to 3½ feet.	Moderate: slope.	Moderate: slope; silty clay subsoil; bedrock at a depth of 1½ to 3½ feet.	Severe: bedrock at a depth of 1½ to 3½ feet.
Huntington:						
Hu	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.	Slight	Severe: subject to flooding.
Lowell:						
LoB	Severe: moderately slow permeability.	Moderate: slope	Moderate: silty clay subsoil.	Slight	Moderate: silty clay subsoil.	Moderate: silty clay subsoil.
LoC	Severe: moderately slow permeability.	Severe: slope	Moderate: silty clay subsoil.	Moderate: slope.	Moderate: slope; silty clay subsoil.	Moderate: slope; silty clay subsoil.
LwB. For Nolin part, see Nolin series.	Severe: moderately slow permeability.	Severe: slope	Moderate: silty clay subsoil.	Moderate: slope.	Moderate: silty clay subsoil.	Moderate: slope; silty clay subsoil.

See footnote at end of table.

of the soils for town and country planning

Dwellings with basements	Roads and streets	Lawns and landscaping	Campsites	Playgrounds	Picnic areas	Paths and trails
Severe: subject to rare flooding.	Moderate: medium soil strength.	Slight	Slight	Slight	Slight	Slight.
Severe: slope; bedrock at a depth of 1 foot to 1½ feet.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet.	Severe: slope	Severe: slope; bedrock at a depth of 1 foot to 1½ feet.	Severe: slope	Moderate: slope; silty clay loam surface layer.
Severe: slope; bedrock at a depth of 1 foot to 1½ feet; rock outcrops.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet; rock outcrops.	Severe: slope; bedrock at a depth of 1 foot to 1½ feet; rock outcrops.	Severe: slope	Severe: slope; bedrock at a depth of 1 foot to 1½ feet; rock outcrops.	Severe: slope	Severe: slope.
Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding; poorly drained.	Severe: subject to flooding; poorly drained.	Severe: subject to flooding; poorly drained.	Severe: poorly drained.	Severe: poorly drained.	Severe: poorly drained.
Severe: slope; rippable rock at a depth of 1½ to 3½ feet.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope; silty clay loam surface layer.
Severe: slope; flaggy; rippable rock at a depth of 1½ to 3½ feet.	Severe: slope	Severe: slope; flaggy.	Severe: slope	Severe: slope; flaggy.	Severe: slope	Severe: slope; silty clay surface layer.
Severe: rippable rock at a depth of 1½ to 3½ feet.	Moderate: medium soil strength; slope.	Moderate: slope; silty clay loam surface layer; rippable bedrock at a depth of 1½ to 3½ feet.	Moderate: slope; slow permeability; silty clay loam surface layer.	Severe: slope	Moderate: slope; silty clay loam surface layer.	Moderate: silty clay loam surface layer.
Severe: bedrock at a depth of 1½ to 3½ feet.	Moderate: slope; medium soil strength.	Moderate: slope; silty clay loam surface layer; bedrock at a depth of 1½ to 3½ feet.	Moderate: slope; moderately slow permeability; silty clay loam surface layer.	Severe: slope	Moderate: slope; silty clay loam surface layer.	Moderate: silty clay loam surface layer.
Severe: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Moderate: subject to flooding.	Slight.
Moderate: medium soil strength.	Moderate: medium soil strength.	Slight	Moderate: moderately slow permeability.	Moderate: slope; moderately slow permeability.	Slight	Slight.
Moderate: slope; medium soil strength.	Moderate: medium soil strength.	Moderate: slope	Moderate: slope; moderately slow permeability.	Severe: slope	Moderate: slope.	Slight.
Moderate: slope; medium soil strength.	Moderate: medium soil strength.	Moderate: slope	Moderate: slope; moderately slow permeability.	Severe: slope	Moderate: slope.	Slight.

TABLE 8.—*Degree and kind of limitation of the*

Soil series and map symbols	Septic tank absorption fields	Sewage lagoons	Sanitary landfill[1]			Shallow excavations
			Trench type	Area type	Cover material	
Maury:						
MaB	Slight	Moderate: slope; moderate permeability.	Moderate: silty clay in lower part of subsoil.	Slight	Moderate: silty clay in lower part of subsoil.	Moderate: silty clay in lower part of subsoil.
MaC	Moderate: slope.	Severe: slope	Moderate: silty clay in lower part of subsoil.	Moderate: slope.	Moderate: slope; silty clay in lower part of subsoil.	Moderate: slope; silty clay in lower part of subsoil.
McAfee:						
McC	Severe: bedrock at a depth of 1½ to 3½ feet; moderately slow permeability.	Severe: slope; bedrock at a depth of 1½ to 3½ feet.	Severe: bedrock at a depth of 1½ to 3½ feet.	Moderate: slope.	Moderate: bedrock at a depth of 1½ to 3½ feet; slope; silty clay subsoil.	Severe: bedrock at a depth of 1½ to 3½ feet.
McD	Severe: slope; bedrock at a depth of 1½ to 3½ feet; moderately slow permeability.	Severe: slope; bedrock at a depth of 1½ to 3½ feet.	Severe: bedrock at a depth of 1½ to 3½ feet.	Severe: slope	Severe: slope	Severe: slope; bedrock at a depth of 1½ to 3½ feet.
Newark: Ne	Severe: subject to flooding; somewhat poorly drained.	Severe: subject to flooding.	Severe: subject to flooding; somewhat poorly drained.	Severe: subject to flooding.	Slight	Severe: somewhat poorly drained; subject to flooding.
Nicholson: NfB	Severe: slow permeability.	Moderate: slope.	Moderate: silty clay in lower part of subsoil; moderately well drained.	Slight	Moderate: silty clay in lower part of subsoil.	Moderate: silty clay in lower part of subsoil; moderately well drained.
Nolin: No	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.	Slight	Severe: subject to flooding.

[1] Onsite studies of the underlying strata, water tables, and hazards of aquifer pollution and drainage into ground water need to be made for land fills deeper than 5 or 6 feet.

to a depth of 5 feet, so a limitation of *slight* or *moderate* may not be valid if trenches are much deeper.

In area-type sanitary landfills, refuse is placed in successive layers on the surface of the soil. Daily and final cover material must be imported because no trenches are dug, unless it is to obtain cover material. The ratings for this use are based on permeability, natural drainage, flood hazard, and slope.

The ratings for cover material for area-type landfills are based on natural drainage, slope, depth to bedrock, stoniness, percent of coarse fragments, and the dominant texture and moist consistence to a depth of 5 feet.

Shallow excavations are those that require digging or trenching to a depth of less than 5 feet. Excavations for pipelines, sewer lines, phone and power transmission lines, basements, open ditches, and cemeteries are examples. Good workability, moderate resistance to sloughing, gentle slopes, absence of rock outcrop or big stones, and freedom from flooding or absence of a high water table are desirable. Natural drainage and depth to bedrock are also considered in the ratings.

Dwellings, as rated in table 8, are not more than three stories high and are supported by foundation footings placed in undisturbed soil (fig. 10). For such dwellings, it is assumed that no more than 8 feet of excavation is needed for the basement. The features that affect the rating of a soil for dwellings are those that relate to capacity to support load and resist settlement under load, and those that relate to ease of excavation. Properties that affect capacity to support load are wetness, depth to seasonal water table, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect excavation are wetness, depth to seasonal water table, slope, depth to bedrock, and content of stones and rocks.

Roads and streets, as rated in table 8, have an all-weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid *soils for town and country planning*—Continued

Dwellings with basements	Roads and streets	Lawns and landscaping	Campsites	Playgrounds	Picnic areas	Paths and trails
Slight	Moderate: medium strength in lower part of subsoil.	Slight	Slight	Moderate: slope	Slight	Slight.
Moderate: slope.	Moderate: slope; medium strength in lower part subsoil.	Moderate: slope.	Moderate: slope.	Severe: slope	Moderate: slope.	Slight.
Severe: bedrock at a depth of 1½ to 3½ feet.	Moderate: bedrock at a depth of 1½ the 3½ feet; medium strength in lower part of subsoil.	Moderate: slope; bedrock at a depth of 1½ to 3½ feet.	Moderate: slope; moderately slow permeability.	Severe: slope	Moderate: slope.	Slight.
Severe: slope; bedrock at a depth of 1½ to 3½ feet.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; somewhat poorly drained.	Severe: subject to flooding; somewhat poorly drained.	Moderate: subject to flooding; somewhat poorly drained.	Moderate: somewhat poorly drained.
Severe: seasonal perched water table.	Moderate: slope; medium strength in lower part of subsoil.	Slight	Moderate: slow permeability.	Moderate: slope; slow permeability.	Slight	Slight.
Severe: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Severe: subject to flooding.	Moderate: subject to flooding.	Moderate: subject to flooding.	Slight.

[2] Many areas of this soil are not subject to flooding.

surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand, and most cuts and fills are less than 5 feet deep.

Properties that most affect design and construction of roads and streets are load-supporting capacity and stability of the subgrade and the workability and quantity of cut and fill material available. The AASHTO and Unified classifications of the soil material and the shrink-swell potential indicate traffic-supporting capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect ease of excavation and amount of cut and fill needed to reach an even grade.

Lawns and landscaping require soils that are suitable for the establishment and maintenance of turf for lawns and ornamental trees and shrubs for landscaping. The best soils are firm after rains, are not dusty when dry, and absorb water readily and hold sufficient moisture for plant growth. The surface layer should be free of stones. If shaping is required, the soils should be thick enough over bedrock or hardpan to allow for necessary grading. In rating the soils, the availability of water for sprinkling is assumed.

Campsites are used intensively for tents, small camp trailers, and vacation cottages that have septic tanks. Little preparation of the site is required, other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good drainage and permeability, and a surface free of rocks and coarse fragments. Also, they are not subject to flooding during periods of heavy use, and their surface is firm after rain but not dusty when dry.

Playgrounds are areas used intensively for baseball, football, badminton, and similar organized games. Suitable soils need to withstand intensive foot traffic. The best soils have a nearly level surface free of coarse fragments and Rock outcrop. They have good drainage and are not subject to flooding during periods of heavy use.

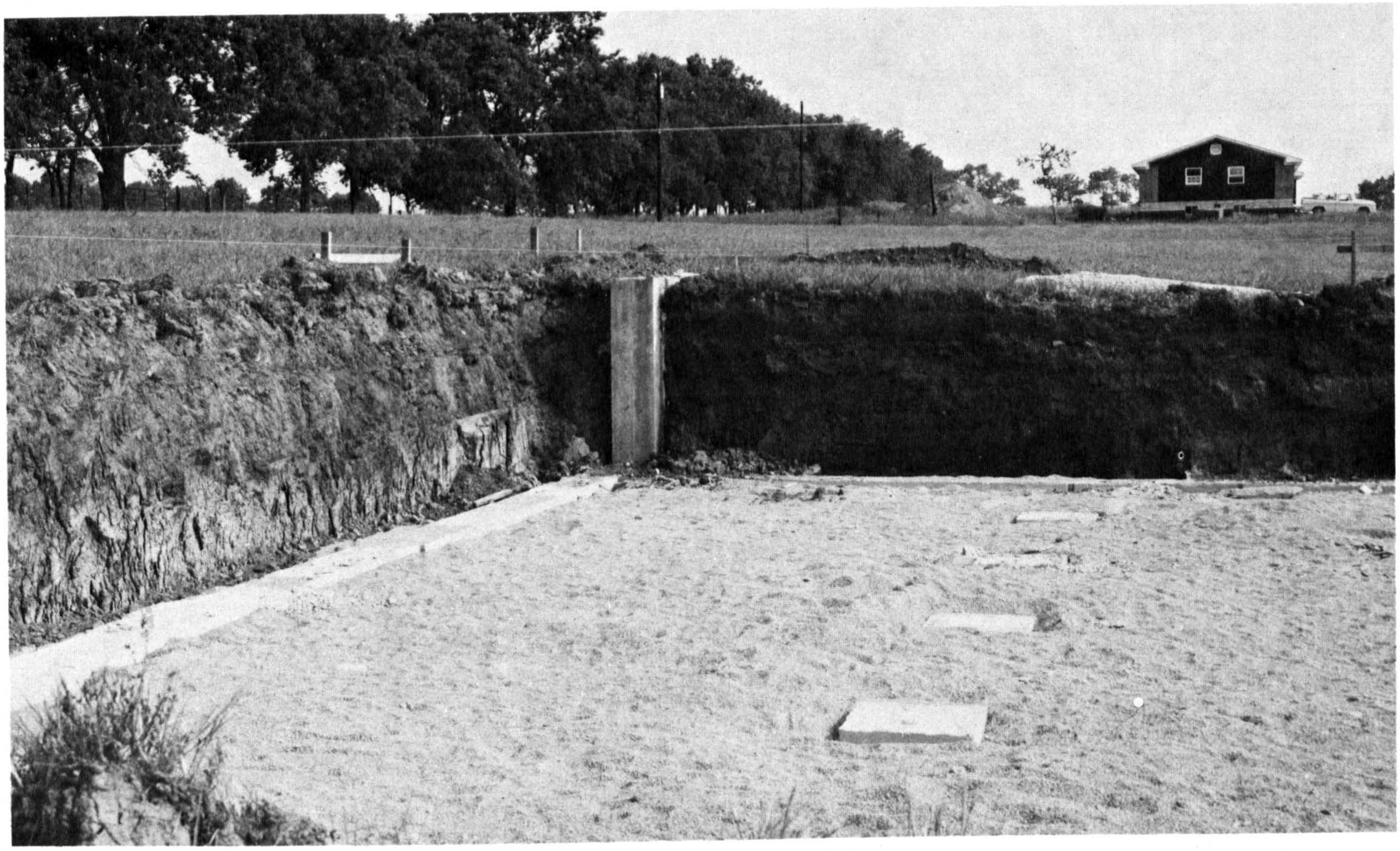

***Figure 10.*—Maury silt loam, 2 to 6 percent slopes, is suitable for use as a site for houses with basements.**

Their surface is firm after rain but not dusty when dry. If grading and leveling are required, depth to rock is important.

Picnic areas are attractive natural or landscaped tracts that carry heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet but not dusty when dry, have good drainage, are not subject to flooding during the season of use, and do not have slopes or stones that can greatly increase the cost of leveling or of building access roads.

Paths and trails are used for local and cross-country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

Formation, Morphology, and Classification of the Soils

In this section, the factors of soil formation and the morphology of the soils in Scott County are discussed. The current comprehensive system of soil classification is partly explained and the soils are placed in the current system.

Factors of Soil Formation

The characteristics of a soil at any given point depend on the physical and chemical composition of parent material; on climate; on relief; on plant and animal life; and on time. Soils form by the interactions of these five factors. The relative importance of each factor differs from one soil to another. In some areas one factor may dominate the formation of soil characteristics, and in other areas another factor may dominate. In Scott County, the factors of climate and plant and animal life are not likely to vary greatly, but there are differences in relief and parent material.

Because the interrelationships between the five factors are so complex the effect of any one factor is hard to determine. The following is a brief discussion of some of the ways in which these factors have influenced soil formation in Scott County.

Parent material

Parent material is the soft, unconsolidated mass in which soils form. In Scott County the soils formed in parent material that formed from the weathering or decomposition of rocks and minerals of the Ordovician geologic period (*15*). They formed in residuum (parent material that weathered in place), alluvium (material that washed from soils and was deposited by streams), and loess (wind-blown material).

Eden soils formed on uplands in residuum that weathered mostly from calcareous shale that has thin layers of limestone and beds of siltstone. Cynthiana, Faywood, Lowell, and Nicholson soils formed mostly in material that weathered from limestone that has thin layers of shale. Maury and McAfee soils formed mostly in phosphatic limestone residuum. All these soils are clayey in the lower part of the B horizon and throughout the C horizon. Many areas of Maury soils are high in content of phosphate.

Nicholson, Maury, and McAfee soils formed mostly in residuum. Some of these soils are on old stream terraces, and they apparently formed in clayey alluvium. The upper part of these soils is high in content of silt; therefore the soils apparently formed in material that had a 12- to 36-inch mantle of loess.

Ashton soils formed in alluvium on low stream terraces, and Huntington, Newark, and Nolin soils formed in alluvium on flood plains. These soils have less clay in the B horizon and C horizon than soils that formed in residuum.

Nolin soils on flood plains along Eagle Creek are lighter colored than Huntington soils on flood plains along North Elkhorn Creek and South Elkhorn Creek. The alluvium along Eagle Creek washed from soils—mostly Eden soils—that are low in content of organic matter, and the alluvium along Elkhorn Creek washed from soils—Maury and McAfee soils among others—that are higher in content of organic matter. The difference in color is the result.

Dunning soils are finer textured than Huntington, Newark, or Nolin soils. They apparently formed in an old lake bed in slack-water alluvium.

Climate

The climate of Scott County is humid-mesic. The average annual precipitation is about 43 inches (*10*). The soils are never dry, and they are subject to leaching throughout most of the year. The average annual air temperature is about 55° F, and the average January air temperature is about 43 degrees lower than the average July temperature.

The soils in Scott County that best show the influence of climate have a leached, acid (unlimed), dark grayish-brown Ap horizon and an illuviated brown, strong brown, or yellowish-brown Bt horizon that is finer textured than the surface layer. Examples are the well drained Lowell soils. The depth of leaching is not great because base saturation of most soils within 50 inches of the surface is more than 35 percent.

Maury soils have a reddish brown, yellowish red, or red Bt horizon that is thicker than that of Lowell soils. They probably formed partly on an older land surface than Lowell soils, in a climate that is warmer than the present.

Relief

The relief, or position, shape, and slope of the landscape, influences the formation of soils mainly through its effect on drainage and erosion. Relief also influences the formation of soils through variations in exposure to sun, wind, air, drainage, and plant cover.

Lowell, Nicholson, and Maury soils formed in gently sloping to moderately steep areas in the southern part of the county. Runoff is medium, so enough water enters the soils to cause the soil-forming processes to be active. These soils have a very friable A horizon that is low or moderate in organic-matter content. Leaching of bases has caused the A horizon to be medium and very strongly acid, unless the soils have been limed. The B horizon has more clay than the A horizon, and there are clay accumulations to a depth of 40 to more than 60 inches. The B horizon is yellowish brown to reddish brown.

Eden soils and some Cynthiana soils formed in a highly dissected area that has narrow ridges, V-shaped valleys, steep side slopes, and crooked courses. The elevation ranges from about 700 to 1,000 feet above sea level. Runoff is rapid. Because much of the rainfall is lost through runoff, not enough water enters the soils to cause the soil-forming processes to be very active. Soil material is removed by erosion almost as rapidly as it is formed. Many of these soils are eroded. They have a thin Ap horizon that is generally a mixture of the A horizon and B horizon. The A horizon is not highly leached, and reaction is nearly neutral. The B horizon is thin, and clay accumulations do not occur below a depth of 20 to 30 inches. The B horizon does not vary greatly in color from the A horizon and C horizon, and coarse fragments of limestone are in the A, B, and C horizons.

Faywood and McAfee soils are mostly steeper than Lowell and Maury soils, and they are shallower to bedrock. The shallow depth is due in part to recent and geologic erosion.

Newark soils are somewhat poorly drained and have a seasonal high water table because they are in low areas in first bottoms where water tends to collect.

Plant and animal life

Plants affect soil formation mostly by adding organic matter. Animals mix the soil and help keep it open and porous. Bacteria and fungi contribute mainly by decomposing the organic matter and releasing plant nutrients. The organic matter imparts a dark color to the soil material and affects structure.

Most soils in Scott County formed under a hardwood forest. Hardwood trees allow calcium and other bases to leach from the soil more readily than grasses. In the few remaining undisturbed areas, Lowell or Nicholson soils have a thin, very dark grayish brown A1 horizon, and their structure is moderate fine granular. They have a thin, leached, light-colored A2 horizon that has weak, granular structure. Their B horizon is brighter colored, and generally has moderate medium subangular blocky structure.

The environment in Scott County was changed when man cleared the trees. Most of the soils have been limed, seeded to grasses and legumes, and plowed many times since the trees were cut. Much man-made erosion has resulted. The main change is that there is now a plow layer instead of a thin, dark-colored, organic-mineral layer over a leached layer.

Dunning soils have a thicker, darker colored A horizon than commonly develops in soils formed under a hardwood forest. They probably formed in an old shallow lake under dense marshy vegetation. In places soils similar to Maury soils and some other soils have a thick, dark colored A horizon. The soils in these places may have formed under canebrakes and grasses as well as under hardwood trees. Soils formed under grasses have a thicker, darker colored A horizon than soils formed under hardwood trees.

Time

In the formation of soils generally a long time is required for change to take place in the parent material. But, soils are "aged" according to the degree of soil development. Soils that have weakly developed genetic soil horizons are immature, while soils that have strongly developed genetic horizons are mature, even though the parent materials from which they formed are the same age.

The soils in Scott County range from immature to mature. Nolin, Huntington, and Newark soils are in first bottoms that are subject to overflow. They are immature because they receive new sediments with each flooding and because they have weakly developed soil horizons below the plow layer. Cynthiana and Eden soils are somewhat immature. They have a thin B horizon as a result of excessive erosion during formation. Lowell, Maury, and Nicholson soils are mature soils and have well developed horizons.

Maury soils have characteristics that indicate that they are much older than Lowell soils. They have clay accumulations at greater depths and they are redder and more oxidized than Lowell soils.

Morphology of Soils

The genetic horizons in soil profiles can be used to make comparisons among different soils. These horizons are designated by the letters O, A, B, C, and R. A representative profile for each soil series in Scott County is described in the section "Descriptions of the Soils."

The letter O is used to designate organic horizons that occur on top of the mineral part of the soil. Because the soils in Scott County have been cleared and farmed for many years, the O horizon either has been removed from the soil, is mixed with the A horizon, or is too thin for designation as a true O horizon.

The A horizon is considered the surface layer. Undisturbed soils can have A1, A2, and A3 horizons, but these subhorizons have been mixed together by cultivation and pasturing in most soils in Scott County. They are combined and designated as Ap horizons, which indicates that they have been plowed. The Ap horizon in some eroded areas is a mixture of part of the original A horizon and the upper part of the original B horizon.

Most A horizons in Scott County are light colored, but Dunning and Huntington soils have a dark brown or very dark grayish brown A horizon that is too thick to be mixed by plowing. The dark layers below the plow layer in these soils are designated as A1 horizons to indicate that the horizon has an accumulation of organic matter.

The B horizon is the subsoil. In upland soils in Scott County, it is the horizon that has maximum accumulation, or illuviation, of clay, iron, aluminum, or other material that leached from the A horizon.

The suffix *t* is used to indicate a B horizon that has silicate clay that has moved down from the A horizon. This occurs in all soils in Scott County except those on flood plains. Soils on flood plains have very little movement of clay. The subsoil of Huntington and Nolin soils is designated as a B horizon because it is light in color (lower in organic matter) and has developed weak structure.

The suffix *g* is used to designate horizons that have intense reduction of iron due to stagnant water. The gray colors in Dunning and Newark soils indicate this reduction.

The suffix *x* indicates a fragipan. Nicholson soils have a Bx horizon. The Bx horizon may occur partly because the soil formed in a mantle of loess over clayey residuum. Water standing in the more permeable layer of loess, above the less permeable residuum, may have helped form the fragipan. Fragipans are defined in the Glossary.

The Roman numeral II indicates that the horizon formed from different material than the horizons above it. Nicholson soils have a IIB horizon.

Many B horizons can be divided into B1, B2, and B3 horizons. The B2 horizon is the main part of the genetic horizon. The B1 horizon has some properties, such as texture, color, or structure, similar to the A horizon, and the B3 horizon has some properties similar to the C horizon. Divisions of these horizons are numbered consecutively from the top of the B horizon, for example B21, B22, B23.

The C horizon is the underlying material. It consists of material below the A or B horizon that except for weathering is not altered by the soil-forming processes. Subdivisions of the C horizon, as in Newark soils, are numbered consecutively from the top of the C horizon.

R designates bedrock. The R horizon is not considered to be a part of the soil, but if it occurs at a shallow depth, it exercises a great influence on the use of a soil.

Classification of Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

The narrow categories of classification, such as those used in detailed soil surveys, allow us to organize and apply knowledge about soils in managing farms, fields, and woodland; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas such as countries and continents.

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Because this system is under continual study, readers interested in developments of the current system should refer to the latest literature available (*12*, *14*).

The current system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped. In table 9, the soil series of Scott County are placed in four categories of the current system. Classes of the current system are briefly defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The properties used to differentiate among soil orders are those that

TABLE 9.—*Classification of soil series*

Soil series	Family	Subgroup	Order
Ashton	Fine-silty, mixed, mesic	Mollic Hapludalfs	Alfisols.
Cynthiana	Clayey, mixed, mesic	Lithic Hapludalfs	Alfisols.
Dunning, dark subsoil variant	Fine, mixed, mesic	Cumulic Haplaquolls	Mollisols.
Eden	Fine, mixed, mesic	Typic Hapludalfs	Alfisols.
Faywood	Fine, mixed, mesic	Typic Hapludalfs	Alfisols.
Huntington	Fine-silty, mixed, mesic	Fluventic Hapludolls	Mollisols.
Lowell	Fine, mixed, mesic	Typic Hapludalfs	Alfisols.
Maury	Fine, mixed, mesic	Typic Paleudalfs	Alfisols.
McAfee	Fine, mixed, mesic	Mollic Hapludalfs	Alfisols.
Newark	Fine-silty, mixed, non-acid, mesic.	Aeric Fluvaquents	Entisols.
Nicholson	Fine-silty, mixed, mesic	Typic Fragiudalfs	Alfisols.
Nolin	Fine-silty, mixed, mesic	Dystric Fluventic Eutrochrepts	Inceptisols.

tend to give broad climatic groupings of soils. The two exceptions to this are the Entisols and Histosols, which occur in many different climates. Each order is named with a word of three or four syllables ending in *sol* (Alf-i-sol).

SUBORDER. Each order is subdivided into suborders that are based primarily on those soil characteristics that seem to produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of water-logging, or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order. An example is *udalf* (*ud*, meaning moist but not wet, and dry for short periods or not at all).

GREAT GROUP. Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated; those that have pans that interfere with growth of roots, movement of water, or both; and thick, dark-colored surface horizons. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark red and dark brown colors associated with basic rocks, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Hapludalfs (*Hapl*, the simplest set of horizons).

SUBGROUP. Great groups are subdivided into subgroups, one representing the central (typic) segment of the group, and others called intergrades that have properties of the group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Hapludalf (a typical hapludalf).

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

Laboratory Data [5]

As part of this soil survey, samples from selected soils were analyzed by the Kentucky Agricultural Experiment Station. The analyses were made according to laboratory methods and procedures of the Soil Conservation Service and described in Soil Survey Investigations Report (SSIR) No. 1 (*13*). The results of these analyses are shown in table 10. The data in these tables are useful in classifying soils and developing concepts of soil genesis. In addition, this information aids in the interpretation of these and similar soils in the area.

Profiles of six of the selected soils are described in this section. The profile of Lowell silt loam (Laboratory No. S72KY-105-3) is described in the section "Descriptions of the Soils."

EDEN SILTY CLAY, S72KY-105-1

Ap—0 to 4 inches: dark grayish brown (10YR 4/2) silty clay; moderate fine and medium granular structure; friable; common fine roots; abrupt smooth boundary.

B21t—4 to 7 inches; yellowish brown (10YR 5/6) clay; moderate medium angular blocky structure parting to moderate very fine angular blocky; firm; few small roots; few fine pores; few small black concretions; many light olive brown (2.5Y 5/4) clay films; few cavities filled with wormcasts; neutral; clear smooth boundary.

B22t—7 to 13 inches; light olive brown (2.5Y 5/4) clay; few fine faint pale yellow (2.5Y 7/4) mottles; moderate medium angular blocky structure; firm; few fine roots; few fine pores; few small black concretions; many clay films; neutral; clear smooth boundary.

B23t—13 to 24 inches; light olive brown (2.5Y 5/6) very channery silty clay; moderate medium angular blocky structure; very firm; few fine roots; few fine pores; many clay films; 50 percent soft siltstone fragments; mildly alkaline; gradual smooth boundary.

B31t—24 to 36 inches; mottled yellowish brown (10YR 5/6), light olive brown (2.5Y 5/4), and grayish brown (2.5Y 5/2) channery silty clay; moderate fine angular blocky structure; very firm; few fine pores; many clay films; 20 percent soft siltstone and shale frag-

[5] H. H. BAILEY, professor of agronomy, University of Kentucky, helped prepare this section.

TABLE 10.—*Physical and chemical*

[Tests performed at the Kentucky Agricultural Experiment

Soil name and location	Horizon	Depth	USDA texture	Particle-size distribution [1]				
				Sand (2.0–0.05 mm)	Silt (<0.05–0.002 mm)	Clay (<0.002 mm)	Sand coarser than very fine (2.0–0.1 mm)	Very fine sand and silt (0.1–0.002 mm)
				Percent	*Percent*	*Percent*	*Percent*	*Percent*
Eden silty clay:								
0.1 mile east of Interstate Highway 75 and 0.7 mile north of Rogers Gap road; about 7 miles north of Georgetown. (Lab. No. S72KY–105–1)	Ap	0–4	Silty clay	2.2	50.2	47.6	1.2	51.2
	B21t	4–7	Clay	1.4	37.0	61.6	0.7	37.7
	B22t	7–13	Clay	1.6	38.4	60.0	0.6	39.4
	B23t	13–24	Silty clay	2.2	55.1	42.7	0.5	56.8
	B31t	24–36	Silty clay	1.6	46.4	52.0	0.4	47.6
	B32t	36–53	Clay	2.7	38.4	58.9	1.8	39.3
	C	53–73	Silty clay loam	7.9	54.4	37.7	5.6	56.7
Lowell silt loam:								
200 feet northwest of large barn, 0.6 mile north of U.S. Highway 277, 1.2 miles northeast of Newtown, and about 6 miles east of Georgetown. (Lab. No. S72KY–105–3)	Ap	0–7	Silt loam, silty clay loam.	9.7	62.3	28.0	8.5	63.5
	B1	7–13	Silty clay loam	6.7	60.0	33.3	5.9	60.8
	B21t	13–23	Silty clay loam	7.9	58.6	33.5	6.4	60.1
	B22t	23–30	Silty clay loam	10.3	52.4	37.3	8.9	53.8
	B23t	30–37	Silty clay	10.0	45.2	44.8	8.4	46.8
	B24t	37–45	Clay	7.4	32.8	59.8	5.6	34.6
	B3	45–57	Clay	6.1	29.8	64.1	4.4	31.5
	C	57–68	Clay	2.3	33.1	64.6	1.4	34.0
Lowell silt loam:								
500 feet south of main barn on Robert McMillan farm, 0.2 mile north of Leesburg Road, 3.4 miles northeast of Newtown, and about 7.5 miles north of Georgetown. (Lab. No. S72KY–105–4)	Ap	0–9	Silt loam	7.5	68.3	24.2	6.7	69.1
	B21t	9–18	Silty clay loam	7.8	60.0	32.2	7.0	60.8
	B22t	18–28	Silty clay loam	9.5	62.7	27.8	8.0	64.4
	B23t	28–35	Silty clay loam	12.9	55.9	31.2	11.6	57.2
	B24t	35–44	Silty clay	10.9	45.3	43.8	9.6	46.6
	B25t	44–52	Clay	5.9	37.5	56.6	4.9	38.5
	B31t	52–69	Clay	2.2	33.5	64.3	2.0	33.7
	B32t	69–72	Clay	1.9	35.7	62.4	1.4	36.2
Maury silt loam:								
1.2 miles south of Newtown and 0.7 mile southeast of right angle turn of county road, about 5.4 miles east of Georgetown. (Lab. No. S72KY–105–5)	Ap	0–11	Silt loam	5.8	71.3	22.9	5.2	71.9
	B1	11–18	Silt loam	6.3	67.8	25.9	5.8	68.3
	B21t	18–25	Silty clay loam	6.7	59.1	34.2	6.2	59.6
	B22t	25–35	Silty clay loam	8.8	53.7	37.5	8.2	54.3
	B23t	35–44	Silty clay	7.5	51.9	40.6	6.9	52.5
	B24t	44–53	Silty clay	10.5	46.3	43.2	9.8	47.0
	B25t	53–66	Silty clay	11.3	47.5	41.2	10.6	48.2
	B26t	66–76	Silty clay	15.6	43.8	40.6	14.6	44.8
Maury silt loam:								
750 feet east of farmhouse, 1.2 miles east of Interstate Highway 75, 0.4 mile north of U.S. Highway 277, and about 3 miles northeast of Georgetown. (Lab. No. S72KY–105–6)	Ap	0–8	Silt loam	6.0	69.5	24.5	5.1	70.4
	A3	8–16	Silt loam	5.3	68.6	26.1	4.4	69.5
	B1	16–21	Silty clay loam	5.9	63.9	30.2	4.9	64.9
	B21t	21–29	Silty clay loam	8.2	53.4	38.4	7.0	54.6
	B22t	29–36	Silty clay	9.5	44.1	46.4	7.9	45.7
	B23t	36–42	Clay	10.8	38.1	51.1	8.6	40.3
	B24t	42–51	Clay	10.8	34.8	54.4	7.4	38.2
	B25t	51–58	Clay	16.1	29.4	54.5	11.7	33.8
	B3t	58–75	Clay	15.6	27.2	57.2	9.6	33.2
Nicholson silt loam:								
500 feet north of farmhouse, 0.7 mile north of U.S. Highway 227, 1.3 miles northeast of Newtown and about 6.1 miles east of Georgetown. (Lab. No. S72KY–105–7)	Ap	0–8	Silt loam	7.3	70.4	22.3	6.7	71.0
	B2t	8–18	Silty clay loam	10.1	60.7	29.2	9.2	61.6
	Bx1	18–26	Silt loam	17.2	58.4	24.4	15.2	60.4
	Bx2	26–34	Silty clay loam	14.2	48.5	37.3	12.0	50.7
	IIB2t	34–49	Clay	12.1	29.5	58.4	9.5	32.1
	IIB3t	49–64	Clay	4.1	31.3	64.6	2.5	32.9
Nicholson silt loam:								
100 feet west of main barn, 1.4 miles west of Leesburg-Newtown Road, 3.3 miles northeast of Newtown, and about 7.4 miles northeast of Georgetown. (Lab. No. S72KY–105–8)	Ap	0–8	Silt loam	8.2	68.0	23.8	7.4	68.8
	A3	8–14	Silt loam	6.4	68.1	25.5	5.7	68.8
	B21t	14–21	Silty clay loam	6.4	65.3	28.3	5.5	66.2
	B22t	21–28	Silty clay loam	7.1	60.9	32.0	6.0	62.0
	Bx1	28–46	Silty clay loam	8.8	59.5	31.7	7.4	60.9
	B23t	46–70	Silty clay	6.8	51.0	42.2	5.0	52.8
	B3t	70–80	Silty clay	5.8	42.2	52.0	4.3	43.7

[1] Based on Method 3A1 (*13*). Particles larger than 2 millimeters were discarded.
[2] Based on Method 4A1, saran-coated clods (*13*).
[3] Based on Method 8C1a (*13*).
[4] Based on Method 5A1, ammonium acetate (*13*).
[5] Based on Method 5B1a, ammonium acetate (*13*).

characteristics of selected soils

Station, Lexington. Dashes mean no tests were made]

Bulk Density [2]		Coefficient of linear extensibility	Reaction 1:1H_2O [3]	Extractable bases [4] (milliequivalents per 100 grams of soil)				Total extractable bases [5]	Cation exchange capacity [6]	Base saturation
Moist	Dry			Ca	Mg	K	Na			
Grams per cubic centimeter	*Grams per cubic centimeter*		*pH*					*Milliequivalents per 100 grams of soil*	*Milliequivalents per 100 grams of soil*	*Percent*
---------	---------	-------------	6.2	18.8	0.16	0.74	0.09	19.79	24.2	81.7
---------	---------	-------------	6.6	24.9	0.14	0.43	0.13	25.60	27.3	93.8
---------	---------	-------------	6.5	([8])	0.10	0.33	0.14	([8])	26.1	([8])
1.55	1.72	([9]) 0.035	7.2	([8])	0.05	0.19	0.27	([8])	20.2	([8])
---------	---------	-------------	7.1	([8])	0.08	0.26	0.24	([8])	26.1	([8])
---------	---------	-------------	7.4	([8])	0.08	0.30	0.20	([8])	28.6	([8])
---------	---------	-------------	7.9	([8])	0.05	0.18	0.15	([8])	17.5	([8])
---------	---------	-------------	5.5	6.25	0.12	0.28	0.12	6.77	15.0	45.2
---------	---------	-------------	5.7	6.75	0.10	0.15	0.13	7.13	14.6	48.7
---------	---------	-------------	5.9	10.0	0.15	0.13	0.11	10.39	17.9	58.2
1.6	1.7	([10]) 0.012	6.0	10.88	0.19	0.15	0.13	11.35	18.3	62.1
---------	---------	-------------	5.6	10.25	0.22	0.13	0.12	10.72	22.1	48.5
---------	---------	-------------	5.1	9.75	0.23	0.20	0.13	10.31	35.1	29.3
1.43	1.66	0.052	4.8	10.50	0.27	0.28	0.15	11.20	35.9	31.2
---------	---------	-------------	4.9	22.25	0.35	0.31	0.15	23.06	34.7	66.5
---------	---------	-------------	5.6	8.0	1.0	0.67	0.09	9.76	13.2	74.0
---------	---------	-------------	6.5	10.5	1.2	0.23	0.30	12.23	15.3	79.8
---------	---------	-------------	5.8	9.0	0.8	0.12	0.09	10.01	15.5	64.7
---------	---------	-------------	5.2	6.2	0.7	0.10	0.08	7.08	17.8	39.7
1.47	1.31	([9]) 0.037	4.9	7.9	0.9	0.13	0.03	8.96	23.4	38.3
---------	---------	-------------	4.9	20.1	1.4	0.28	1.60	23.38	31.4	74.5
---------	---------	-------------	5.9	([8])	1.3	0.27	0.11	([8])	31.1	([8])
---------	---------	-------------	6.6	([8])	1.1	0.26	0.40	([8])	28.8	([8])
---------	---------	-------------	5.2	3.75	0.70	1.27	0.10	5.82	11.4	51.1
---------	---------	-------------	5.5	4.00	0.70	1.33	0.09	6.12	9.6	63.8
---------	---------	-------------	5.6	6.50	1.10	1.04	0.06	8.70	13.3	65.4
1.57	1.62	([9]) 0.008	6.0	8.13	0.90	0.77	0.07	9.87	15.4	64.1
---------	---------	-------------	5.9	8.50	1.70	0.54	0.09	10.83	14.9	72.7
---------	---------	-------------	5.7	7.25	2.00	0.42	0.07	9.74	15.7	62.0
---------	---------	-------------	5.2	4.38	1.60	0.31	0.06	6.35	14.8	42.9
---------	---------	-------------	4.9	2.75	1.40	0.31	0.14	4.60	14.7	31.3
---------	---------	-------------	6.3	10.8	0.12	0.94	0.07	11.93	15.8	75.5
---------	---------	-------------	5.3	6.5	0.08	0.53	0.06	7.17	12.5	57.4
---------	---------	-------------	6.0	7.8	0.09	0.57	0.12	8.58	14.9	57.6
---------	---------	-------------	6.0	10.0	0.10	0.77	0.11	10.98	17.1	64.2
1.53	1.55	([9]) 0.009	6.4	11.8	0.11	0.60	0.15	12.66	17.8	71.1
---------	---------	-------------	6.1	13.0	0.09	0.41	0.12	13.62	21.1	64.5
---------	---------	-------------	5.8	13.5	0.14	0.36	0.13	14.13	23.6	59.9
---------	---------	-------------	5.4	10.3	0.02	0.30	0.10	10.72	24.6	43.6
---------	---------	-------------	5.3	16.4	0.08	0.38	0.13	16.99	28.8	59.0
---------	---------	-------------	5.8	8.9	0.70	0.61	0.07	10.28	13.4	76.7
1.64	1.67	0.006	5.7	8.7	1.30	0.28	0.14	10.42	16.6	62.8
1.66	1.67	([10]) 0.001	5.6	9.2	1.60	0.10	0.26	11.16	17.1	65.3
---------	---------	-------------	5.2	9.5	2.60	0.10	0.15	12.35	23.3	53.0
---------	---------	-------------	5.3	19.6	4.50	0.29	0.26	24.65	38.4	64.2
---------	---------	-------------	6.5	([8])	13.90	0.26	0.21	([8])	25.7	([8])
---------	---------	-------------	5.4	8.1	0.08	0.31	0.08	8.57	14.8	57.8
---------	---------	-------------	6.6	6.8	0.06	0.13	0.09	7.08	11.2	63.2
---------	---------	-------------	6.6	7.0	0.08	0.13	0.07	7.28	12.1	60.1
1.58	1.57	([10])	6.2	6.4	0.09	0.15	0.11	6.75	12.1	55.6
---------	---------	-------------	5.2	4.5	0.13	0.18	0.09	4.90	13.9	35.2
---------	---------	-------------	5.2	5.63	0.23	0.20	0.18	6.24	15.4	40.5
1.55	1.65	([10]) 0.020	5.8	([8])	0.04	0.28	0.15	([8])	20.7	([8])

[6] Based on Method 5A1a, ammonium acetate (*13*).
[7] Based on Method 5C1 (*13*).
[8] Average of three clods.
[9] Extractable Ca in the presence of $CaCO_3$ exceeds exchangeable Ca. Base saturation of the cation exchange complex is 100 percent, but this is misleading because the reservoir of bases exceeds the cation exchange capacity.
[10] Average of 2 clods.

ments; mildly alkaline; clear wavy boundary.

B32t—36 to 53 inches; mottled strong brown (7.5YR 5/6), light yellowish brown (2.5Y 6/4), and light brownish gray (2.5Y 6/2) clay; moderate medium and fine angular blocky structure; firm; few fine pores; common black stains and soft concretions; many clay films; mildly alkaline; clear, smooth boundary.

C—53 to 73 inches; light olive brown (2.5Y 5/4) soft siltstone and shale which crushes to silty clay loam; relict shale structure; common clay films on horizontal structure; mildly alkaline.

LOWELL SILT LOAM, S72KY-105-4

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common fine roots; few fine pores; few small black concretions; medium acid; abrupt smooth boundary.

B21t—9 to 18 inches; strong brown (7.5YR 5/6) silty clay loam; weak medium blocky structure parting to moderate very fine blocky; firm; few fine roots; few fine pores; common clay films; few small black concretions; few pockets filled with wormcasts; few larger root channels filled with A horizon material; medium acid; clear smooth boundary.

B22t—18 to 28 inches; strong brown (7.5YR 5/6) silty clay loam; common fine faint pale brown (10YR 6/3) mottles; weak medium blocky structure; firm; few fine roots; few fine pores; common small black concretions; many clay films; strongly acid; clear smooth boundary.

B23t—28 to 35 inches; strong brown (7.5YR 5/6) silty clay loam; common medium faint yellowish brown (10YR 5/4) and pale brown (10YR 6/3) mottles; weak coarse blocky structure parting to moderate medium platy; firm; few fine roots; common small and medium black concretions; many clay films, pale brown on blocks and strong brown on plates; few black coatings on plates; very strongly acid; clear smooth boundary.

B24t—35 to 44 inches; yellowish brown (10YR 5/6) silty clay; many medium distinct light brownish gray (10YR 6/2) mottles; moderate medium blocky structure; very firm; common small black concretions; many clay films; common black coatings; very strongly acid; gradual smooth boundary.

B25t—44 to 52 inches; yellowish brown (10YR 5/6) clay; many medium distinct light brownish gray (10YR 6/2) mottles; moderate medium block structure; very firm; common small black concretions; vertical pressure faces 4 to 8 inches apart and coated with gray clay; many clay films; black coatings on some peds; very strongly acid; gradual smooth boundary.

B31t—52 to 69 inches; mottled brownish yellow (10YR 6/6), light yellowish brown (2.5Y 6/4), and light brownish gray (2.5Y 6/2) clay; weak fine and medium blocky structure; extremely firm; few small black concretions; common clay films; few black stains; few pressure faces coated with gray clay, 5 to 10 inches wide and about 10 inches deep at about 20° angle from vertical; medium acid; gradual smooth boundary.

B32t—69 to 72 inches; same as horizon above, except slightly acid and some evidence of decayed roots between a few peds.

MAURY SILT LOAM, S72KY-105-5

Ap—0 to 11 inches; dark yellowish brown (10YR 3/4) silt loam, brown (10YR 4/3) when crushed; moderate medium granular structure; very friable, many fine roots; few very small concretions; slightly acid; abrupt smooth boundary.

B1—11 to 18 inches; brown (7.5YR 4/4) heavy silt loam; weak medium and fine subangular blocky structure; very friable; common fine roots; few fine pores; few small black concretions; few cavities filled with material similar to Ap horizon; medium acid; clear wavy boundary.

B21t—18 to 25 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure parting to very fine blocky; friable; few fine roots; few fine pores; common small black concretions; common clay films; few silt coatings; slightly acid; clear smooth boundary.

B22t—25 to 35 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium; blocky structure parting to very fine blocky; firm, few fine roots; few fine pores; common small black concretions; many clay films; slightly acid; gradual smooth boundary.

B23t—35 to 44 inches; reddish brown (5YR 4/4) silty clay; weak medium blocky structure parting to moderate very fine blocky; friable; few fine roots; common small black concretions; many clay films; slightly acid.

B24t—44 to 53 inches; same as above; divided for sampling; gradual smooth boundary.

B25t—53 to 66 inches; yellowish red (5YR 4/6) silty clay; moderate medium blocky structure parting to very fine blocky; firm; few fine pores; common small black concretions; many dark reddish brown (5YR 3/4) clay films; strongly acid; gradual smooth boundary.

B26t—66 to 76 inches; same as above, except few silt coatings.

MAURY SILT LOAM, S72KY-105-6

Ap—0 to 8 inches; dark brown (7.5YR 3/2) silt loam, dark yellowish brown (10YR 3/4) crushed, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; very friable; many fine roots; slightly acid; gradual smooth boundary.

A3—8 to 16 inches; dark brown (7.5YR 3/2) silt loam, brown (7.5YR 4/4) crushed; weak fine and medium granular structure; very friable; common fine roots; few fine pores; slightly acid; clear smooth boundary.

B1—16 to 21 inches; brown (7.5YR 4/4) silt loam; weak fine granular and weak fine subangular blocky structure; very friable; few fine roots; few fine pores; few small pockets or cavities filled with earth wormcasts; slightly acid; clear smooth boundary.

B21t—21 to 29 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure parting to moderate very fine blocky; friable; few fine roots; few fine pores; few small black concretions; many clay films; slightly acid; gradual smooth boundary.

B22t—29 to 36 inches; yellowish red (5YR 4/6) silty clay; moderate medium blocky structure parting to moderate very fine blocky; friable; few fine roots; few fine pores; common small black concretions; many clay films; few sand size chert; slightly acid; gradual smooth boundary.

B23t—36 to 42 inches; yellowish red (5YR 4/6) clay; moderate medium angular blocky structure; friable; few fine roots; few fine pores; common small black concretions; many clay films; few sand-size particles of chert; slightly acid; gradual smooth boundary.

B24t—42 to 51 inches; yellowish red (5YR 4/6) clay; moderate medium blocky structure parting to very fine blocky; firm; few fine roots; common small black concretions and soft material; many clay films; common sand-size particles of yellow chert and few fragments of chert 1 inch across; slightly acid; clear smooth boundary.

B25t—51 to 58 inches; brown (7.5YR 4/4) clay; moderate medium blocky structure parting to very fine blocky; firm; few fine roots; common soft black concretions; many clay films; common sand-size fragments of chert; slightly acid; abrupt wavy boundary.

B3t—58 to 75 inches; horizontal layers of brown (7.5YR 4/4) and pale brown (10YR 6/3) clay; weak medium blocky structure; very firm; few fine roots in upper few inches; common small black concretions and few horizontal layers of soft black material; many clay films; common sand-size particles of yellow chert; medium acid.

NICHOLSON SILT LOAM, S72KY-105-7

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common small roots; few small black concretions; neutral; abrupt smooth boundary.

B2t—8 to 18 inches; yellowish brown (10YR 5/6) light silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; few fine pores; few small black concretions; common clay films; common thin silt coatings; medium acid; clear smooth boundary.

Bx1—18 to 26 inches; pale brown (10YR 6/3) silty clay loam; common medium faint yellowish brown (10YR 5/6) and light gray (2.5Y 7/2) mottles; moderate very coarse prismatic structure parting to weak medium blocky; very firm and brittle; few fine roots between prisms; prisms coated with grayish silt; common clay films on blocks; common black concretions and black coatings on blocks; few fine vesicular pores; strongly acid; diffuse smooth boundary.

Bx2—26 to 34 inches; yellowish brown (10YR 5/6) silty clay loam; many medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; moderate very coarse prismatic structure parting to moderate medium blocky; very firm and brittle; prisms coated with grayish films and silt coatings; many clay films on blocks; many small black concretions and soft material; few fine vesicular pores; occasional small roots between prisms; very strongly acid; clear smooth boundary.

IIB2t—34 to 49 inches; strong brown (7.5YR 5/6) clay; many medium distinct light brownish gray (2.5Y 6/2) mottles; weak fine blocky structure; very firm; common clay films; few small black concretions; very strongly acid; clear wavy boundary.

IIB3t—49 to 64 inches; yellowish brown (10YR 5/6) clay; common medium distinct light brownish gray (2.5Y 6/2) mottles; weak fine and medium blocky structure; very firm; common clay films; common soft black concretions; few pressure faces; neutral.

NICHOLSON SILT LOAM, S72KY-105-8

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, brown (10YR 4/3) crushed; weak fine granular structure; few small black concretions; neutral; abrupt smooth boundary.

A3—8 to 14 inches; brown (10YR 4/3) silt loam, dark yellowish brown (10YR 4/4) crushed; weak medium subangular blocky and weak fine granular structure; very friable; common fine roots; common fine pores; few small black concretions; few small cavities filled with wormcasts; neutral; clear smooth boundary.

B21t—14 to 21 inches; yellowish brown (10YR 5/4) light silty clay loam; weak medium and fine blocky structure; friable; few fine roots; few fine pores; few clay films; common thin silt coatings; few small black concretions; neutral; gradual smooth boundary.

B22t—21 to 28 inches; yellowish brown (10YR 5/6) silty clay loam; few fine faint pale brown (10YR 6/3) mottles; weak medium and fine blocky structure; friable; few fine roots; common clay films; common silt coatings; few small black concretions; very strongly acid; abrupt wavy boundary.

Bx1—28 to 46 inches; strong brown (7.5YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; moderate very coarse prismatic structure parting to moderate medium blocky; very firm and brittle; few fine roots between prisms; prisms coated with grayish silt; many clay films on blocks; common small black concretions and coatings on blocks; very strongly acid; gradual wavy boundary.

B23t—46 to 70 inches; light brown (7.5YR 6/4) silty clay; moderate medium prismatic structure; very firm and brittle; 2- to 10-millimeter gray (10YR 5/1) silty clay loam prism coatings between prisms; few medium black concretions and many soft black accumulations; very strongly acid; clear wavy boundary.

B3t—70 to 80 inches; yellowish brown (10YR 5/6) silty clay; common medium distinct light brownish gray (2.5Y 6/2) mottles; weak fine and medium blocky structure; very firm; few streaks or cracks filled with gray (10YR 6/1) clay; common clay films; common black coatings; slightly acid.

General Nature of the County

Scott County was the eleventh of the 120 counties in Kentucky to be established. Formed from part of Woodford County in 1792, it was named in honor of General Charles Scott, who later became Governor of Kentucky.

The population in Scott County was 17,948 in 1970. It has increased mostly in the southern part of the county as a result of nearby Lexington. There is a four-year Baptist College in Georgetown.

Physiography, Geology, Relief, and Drainage

The southern part of Scott County is in the Inner Bluegrass physiographic region of Kentucky. The region lies on an old peneplain that is broad and gently sloping or undulating. Most soils are fertile and well drained, but a few are moderately well drained. Crops on a few of the soils in the flood plains respond to artificial drainage but drainage is not needed for row crops.

The northern part of the county is in the Hills of the Bluegrass. This region is highly dissected with narrow ridges and moderately steep to steep slopes. Runoff is rapid. Although the soils are medium to high in plant nutrients, plants suffer from lack of moisture for short periods during most years. Many crops are grown in the narrow flood plains, because moisture is more dependable and there is less hazard of erosion.

The county is underlain by sedimentary rocks of the upper and middle Ordovician series (*15*). The oldest rocks crop out in the southern part of the county and the youngest rocks crop out in the northern part.

The lowest part of the county is about 700 feet above sea level and the highest point is about 1,000 feet.

Water Supply

Scott County is well watered with more than 100 miles of perennial streams along Eagle Creek, North Elkhorn Creek, and South Elkhorn Creek. Several old dams on the creeks once furnished water power for lumber and paper and flour mills, but only one water-powered mill is still operating.

Georgetown, a city of more than 8,000 people, gets most of its water from a large spring called Royal Spring. A large spring in Stamping Ground is called Buffalo Spring. Water is piped to nearly all parts of the county by several water districts.

Farming

Tobacco is the main cash crop in Scott County. According to the U.S. Census of Agriculture, in 1969 more than half of the farm income came from tobacco, and about 40 percent came from livestock.

Pasture plants in the southern part of the county are bluegrass, orchardgrass, timothy, white clover, and alfalfa. There are several thorough-bred horse and pure-bred cattle farms.

The soils in the northern part of the county are somewhat droughty. Moisture-tolerant plants such as tall fescue, Ladino clover, and annual lespedeza are grown for pasture. Many pastures on slopes have reverted to brush and second-growth trees because mowing and weed control are difficult. Scott County was originally covered with an excellent stand of hardwood trees.

Farms have increased that are operated by farmers who have full-time jobs in the nearby towns of Lexington and Frankfort.

Transportation and Markets

Scott County has many roads to market. The county roads are practically all blacktopped. Several state roads in the county and four U.S. Highways cross the county and intersect at Georgetown. Interstate Highway I–75 runs north and south through the county, and I–64 passes through part of the southern part of the county.

The Southern Railway crosses the county from north to south and trains make regular stops at Georgetown. A small airport of Georgetown is suitable for small airplanes.

Farm markets in Scott County cannot compete with the large markets in Lexington, only 12 miles south of Georgetown, and most farm products are taken to Lexington to be sold.

Climate [6]

The climate of Scott County is temperate. Temperature, rainfall, and humidity are favorable for many kinds of plants and animals. Winters are cool and summers are warm. Rainfall is fairly well distributed throughout the year. There is no distinct wet or dry season. Data on temperature and precipitation are given in table 11. The probabilities of last freezing temperatures in spring and first in fall are given in table 12.

The average length of the growing season in the county, from the last freezing temperature in spring to the first freezing temperature in fall, is 190 days. Although the growing season may be slightly shorter in the northern part of the county than in the southern part, the microclimate throughout the county has more influence on growing season than the latitude. Areas that have poor air drainage where frost pockets tend to form have shorter growing seasons than areas that have good air drainage.

A daily freeze-thaw cycle in winter is common. Nighttime temperatures drop below 32° F. on an average of 104 days in winter, but on all but 12 of these 104 days the daytime temperature rises above freezing. A temperature of 0° or below occurs on an average of 1 day each winter.

The moisture supply generally is ample throughout the year, although the amount of precipitation occasionally is either inadequate or excessive (see table 11). A measurable amount of precipitation falls on an average of 129 days per year. Thunderstorms occur on an average of 47 days per year, generally between the beginning of March and the end of September.

In almost every year, 1.1 inches or more of rain falls in a 1-hour period. There is a 30 percent probability that this will happen in July, and less than 1 percent probability that it will happen in December, January, or February. Once in 5 years, most commonly in July, at least 3.3 inches of rain will fall in a 12-hour period. Late spring rainfall of lower intensity but of several days duration delays tillage at times. Long periods of mild sunny weather favorable for harvesting crops are typical in fall.

Annual snowfall at Frankford averages 15.9 inches.

[6] JERRY D. HILL, advisory agricultural meteorologist, National Weather Service, Lexington, helped prepare this section.

TABLE 11.—*Temperature and precipitation*

Month	Temperature [1]				Precipitation			
	Average daily maximum [2]	Average daily minimum [2]	Record high [3]	Record low [3]	Average monthly total [4]	One year in 10 will have [1]— Less than—	One year in 10 will have [1]— More than—	Average number of days with 1 inch or more of snow [1]
	°F	°F	°F	°F	Inches	Inches	Inches	
January	41.3	24.5	71	−11	3.63	1.8	8.8	2
February	44.3	26.2	75	−6	3.19	1.4	6.2	2
March	53.4	33.7	81	12	4.85	2.2	7.5	1
April	66.0	44.6	84	22	3.85	1.9	6.0	([5])
May	75.5	53.8	90	26	3.90	1.5	6.8	0
June	83.5	62.5	97	39	3.91	2.3	7.6	0
July	86.4	65.9	98	47	4.04	2.2	7.7	0
August	85.5	64.4	98	42	3.35	1.5	5.9	0
September	79.6	57.6	96	35	2.74	1.0	4.8	0
October	68.8	46.8	87	25	2.13	.9	3.7	0
November	53.9	35.3	80	9	3.36	1.3	5.4	1
December	43.7	27.2	72	−4	3.32	1.6	5.8	1
Year	65.2	45.2	98	−11	42.26			

[1] From records at Lexington.
[2] Based on data for the period 1941–70.
[3] Based on data for the period 1963–73.
[4] From records at Georgetown Water Works.
[5] Less than one day per month.

TABLE 12.—*Probabilities of last freezing temperature in spring and first in fall*

[Data from records at Frankfort]

Probability	Dates for given probability and temperature				
	16° F or lower	20° F or lower	24° F or lower	28° F or lower	32° F or lower
Spring:					
1 year in 10 later than	March 24	March 31	April 8	April 25	May 7
5 years in 10 later than	March 1	March 13	March 23	April 8	April 22
9 years in 10 later than	February 6	February 23	March 6	March 23	April 7
Fall:					
1 year in 10 earlier than	November 20	November 5	October 28	October 21	October 10
5 years in 10 earlier than	December 6	November 21	November 11	November 1	October 23
9 years in 10 earlier than	December 21	December 7	November 26	November 12	November 4

And 1 inch or more of snow falls, on an average, on only 7 days out of the year.

Annual humidity at 6 a.m. is 80 percent, at 12 noon it is 59 percent, and at 6 p.m. it is 63 percent. The prevailing wind is from the south-southwest, and the average annual wind velocity is 9.8 miles per hour.

The total annual evaporation from lakes and farm ponds averages about 35 inches, which is about 7 inches less than the average annual precipitation. About 75 percent of this evaporation occurs from May to October.

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Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	More than 5.2

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface. In this survey area, bedrock is soft calcareous shale, thin layers of rippable limestone, or hard limestone.

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

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the bases of steep slopes.

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

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

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

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

Plastic.—When wet, easily 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; little affected by moistening.

Depth, soil. In this survey, the terms used to describe the thickness of the soil from its surface to bedrock are deep (more than 40 inches), moderately deep (20 to 40 inches), and shallow (less than 20 inches).

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, 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 classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flaggy soil. A soil that contains thin fragments of limestone or siltstone, 6 to 15 inches long. A single fragment is a flagstone.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

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

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the sol ım the Roman numeral II precedes the letter C.

R layer.—Consolidated rock between the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded 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 of the diameter along the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are very slow (less than 0.06 inch), slow (0.06 to 0.20 inch), moderately slow (0.2 to 0.6 inch), moderate (0.6 to 2.0 inches), moderately rapid (2.0 to 6.0 inches), rapid (6.0 to 20 inches), and very rapid (more than 20 inches).

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

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	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
Slight acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.

Root zone. The part of the soil that can be penetrated by plant roots. In this survey, the terms used to describe the depth of the root zone are deep (more than 40 inches), moderately deep (20 to 40 inches), and shallow (less than 20 inches).

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

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 soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, the terms used to describe slope are nearly level (0 to 2 percent), gently sloping (2 to 6 percent), sloping (6 to 12 percent), moderately steep (12 to 20 percent), steep (20 to 30 percent), and very steep (more than 30 percent.

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

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

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

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

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

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

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

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

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GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs.

Map symbol	Mapping unit	Page	Capability unit
AsA	Ashton silt loam, 0 to 4 percent slopes	7	I-2
ChD	Cynthiana rocky silty clay loam, 12 to 20 percent slopes	7	VIs-1
CyF	Cynthiana-Rock outcrop complex, 20 to 50 percent slopes	7	VIIs-1
Du	Dunning silty clay loam, dark subsoil variant	8	IIIw-1
EdD	Eden silty clay loam, 12 to 20 percent slopes	9	VIe-1
EfE3	Eden flaggy silty clay, 20 to 30 percent slopes, severely eroded	10	VIIe-1
EhB	Eden and Faywood silty clay loams, 2 to 12 percent slopes	10	IVe-2
Hu	Huntington silt loam	11	I-1
LoB	Lowell silt loam, 2 to 6 percent slopes	13	IIe-2
LoC	Lowell silt loam, 6 to 12 percent slopes	13	IIIe-2
LwB	Lowell-Nolin silt loams, 2 to 10 percent slopes	13	IIe-2
MaB	Maury silt loam, 2 to 6 percent slopes	14	IIe-1
MaC	Maury silt loam, 6 to 12 percent slopes	14	IIIe-1
McC	McAfee silt loam, 6 to 12 percent slopes	15	IIIe-3
McD	McAfee silt loam, 12 to 20 percent slopes	15	IVe-1
Ne	Newark silt loam	16	IIw-1
NfB	Nicholson silt loam, 2 to 6 percent slopes	17	IIe-3
No	Nolin silt loam	18	I-1

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