Issued March 1971

SOIL SURVEY
Nelson County, Kentucky

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

Major fieldwork for this soil survey was done in the period 1962 to 1966. Soil names and descriptions were approved in 1967. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1967. 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 Nelson County Soil Conservation District. Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased, on individual order, from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250

HOW TO USE THIS SOIL SURVEY

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

Locating Soils

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

On each sheet of the detailed map, soil areas are outlined and are identified by symbol. 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 of the soils of the county in alphabetic order by map symbol and gives the capability classification and the woodland group classification of each. It shows the page where each soil is described and also the page for the capability unit and the woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or limitations of soils for many specific purposes can be developed by using the soil map and 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 discussions of the capability units and woodland groups.

Foresters and others can refer to the section "Woodland" for information useful in the management of woodland.

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

Community planners and others concerned with suburban development can read about the soil properties that affect the choice of homesites, industrial sites, schools, and parks in the section "Nonfarm and Recreational Developments."

Engineers and builders will find, under "Engineering Uses of the Soils," tables that give descriptions of the engineering properties of the soils and interpretations of these properties as they affect specified engineering practices.

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

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

Cover picture: **Dairy farm at Nazareth College, 1 mile north of Bardstown. Dairying is a major farm enterprise, and farm ponds are a major source of water for livestock. In the foreground is Beasley silt loam, 6 to 12 percent slopes, eroded; on the points of ridges is Bedford silt loam, 2 to 6 percent slopes; and in the background on ridges is Lowell silt loam, 2 to 6 percent slopes.**

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Issued March 1971

SOIL SURVEY OF NELSON COUNTY, KENTUCKY

BY FRED S. ARMS, SOIL CONSERVATION SERVICE

BY FRED S. ARMS, JAMES P. FEHR, DAVID T. CARROLL, BYRON L. WILSON, HERMAN P. McDONALD, AND JAMES C. ROSS, SOIL CONSERVATION SERVICE

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

NELSON COUNTY is in the north-central part of Kentucky (fig. 1). It has an area of 279,780 acres, or about 437 square miles. In 1960, the population was 22,168. Bardstown is the county seat.

The southern and western parts of the county are steep, rough, and hilly and are highly dissected by streams and drainageways. Most of the rest is a nearly level to rolling limestone upland that has steep slopes along major drainageways. Sinks and depressions are common in some places. The extreme northeastern part is characterized by steep hillsides. The elevation ranges from about 400 feet above sea level to about 1,200 feet.

The climate is temperate and humid. The growing season is favorable for the production of corn, tobacco, and small grains, which are the chief crops. Grasses and legumes are grown for hay and pasture on the farms where cattle are raised.

Whisky distilling is the major industry. Numerous smaller industries are also important. Historical landmarks attract tourists.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Nelson 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. As they traveled over the county, 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.

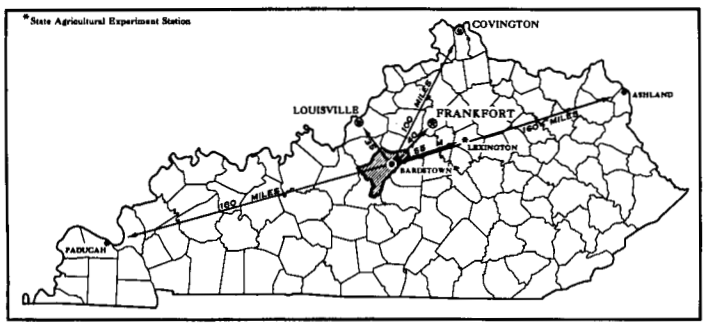

Figure 1.—Location of Nelson County in Kentucky.

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 categories of soil classification most used in a local survey are the *soil series* and the *soil phase* (*15*)[1].

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Rockcastle and Corydon, 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 soil 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, Corydon silt loam, 2 to 6 percent slopes, is one of several phases within the Corydon series.

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

[1] Italicized numbers in parentheses refer to Literature Cited, p. 104.

unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. One such kind of mapping unit, the soil complex, is shown on the soil map of Nelson County. A soil complex consists of areas of two or more soils, so intricately mixed 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 dominant soils, joined by a hyphen. Rockcastle-Weikert complex, 20 to 50 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, Gullied land, acid shaly materials, is a land type in Nelson County.

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

The soil scientists set up trial groups of soils on the basis of yield and practice tables and other data they have collected. They test those groups by further study and by consultation with farmers, agronomists, engineers, and others. Then they 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 publication shows, in color, the soil associations in Nelson County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils, and it is named for the major

Figure 2.—Landscape in the Knobs Region, Tilsit, Trappist, Colyer, Weikert, and Rockcastle soils.

soils. The soils of one association may occur in another, but in a different pattern.

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

The six soil associations in Nelson County are described in the following pages.

Soils of the Knobs Region

The topography of this region is one of rough, irregularly sloping, deeply dissected hills and narrow to moderately broad valleys. The chief crops, grown mostly in the valleys, are pasture and hay plants and corn. Most of the upland is covered with hardwoods and pine, and only small scattered areas are used for crops (fig. 2).

1. McGary-Markland-Lawrence association

Deep, somewhat poorly drained to well-drained, nearly level to gently sloping soils; predominantly fine-textured subsoil; on stream terraces

Although in general the topography of this association is nearly level to gently sloping, there are some fairly deep, narrow drainageways and also a few knobs, some as much as 400 feet high. The dominant soils of the association formed in alluvium (fig. 3).

This association extends from Boston north and west to the county line. It makes up about 2 percent of the county. McGary soils occupy about 34 percent of the association; Markland soils, 15 percent; Lawrence soils, 7 percent; minor soils, 44 percent.

McGary soils, on the large flats, have a clayey subsoil and are somewhat poorly drained. Markland soils, on slopes adjacent to drainageways, also have a clayey subsoil but are better drained than McGary soils. Lawrence soils, on flats near the boundary of the association, are somewhat poorly drained soils that have a fragipan. McGary and Markland soils are strongly acid in the upper part of the subsoil and alkaline in the lower part of the subsoil. Lawrence soils are generally the same but in places are acid throughout.

Minor soils are the well-drained Huntington soils and the somewhat poorly drained Newark soils on the narrow flood plains, the poorly drained Robertsville soils and the moderately well drained Bedford soils on stream terraces, and the Colyer, Whitley, and Trappist soils on the knobs.

Farms in this association are somewhat larger than the average for the county, and most of them are owner operated. Raising of livestock, mainly beef cattle and hogs, is the dominant farm enterprise. There are a few

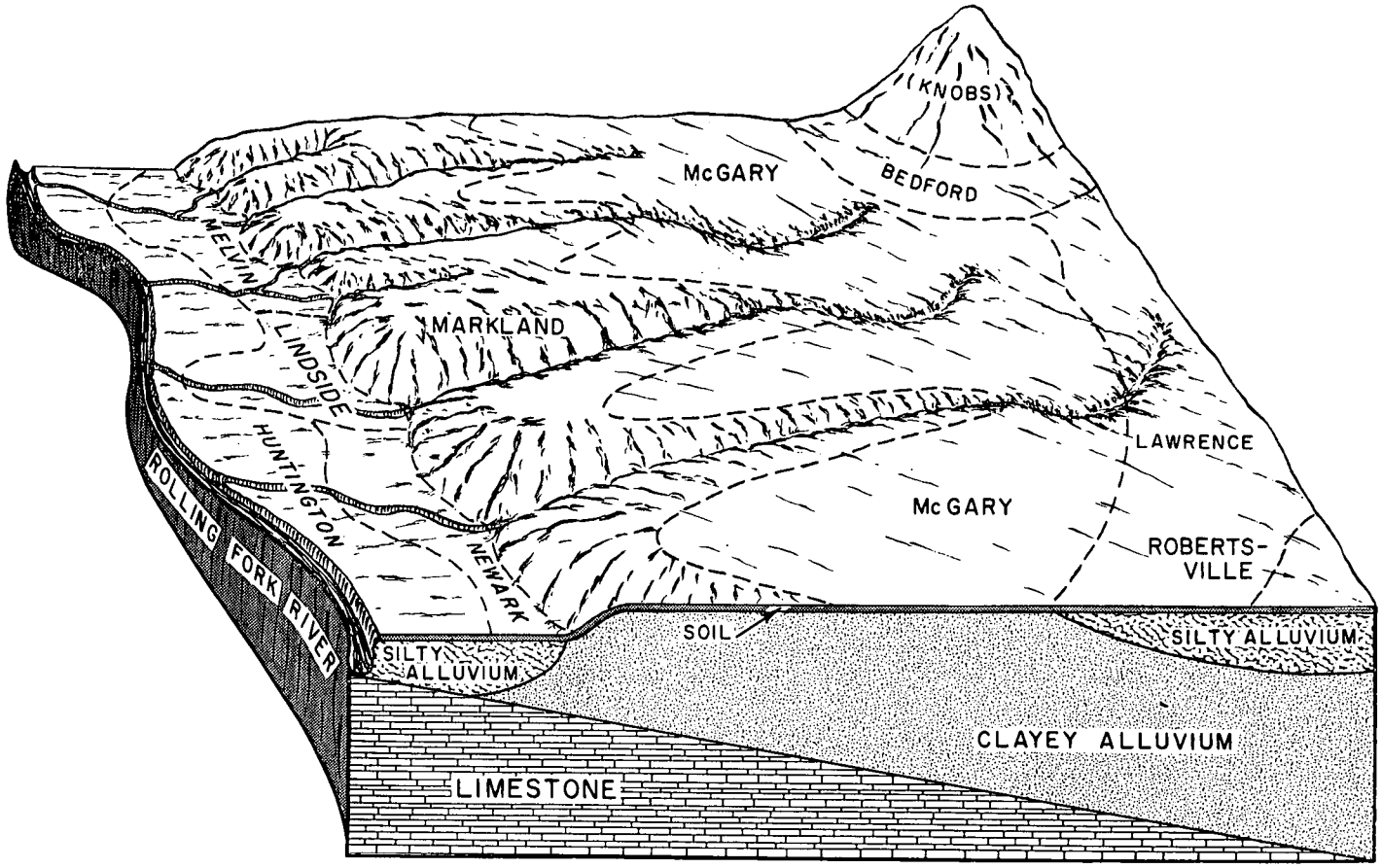

Figure 3.—Typical pattern of soils, topography, and parent material in association 1.

dairy farms. Corn, hay, pasture, some soybeans, and some small grain are produced on most farms. Tobacco is not generally an important crop.

Wetness is the main limitation for growing crops; it can be reduced by artificial drainage. Erosion is not a significant hazard.

2. *Huntington-Lawrence-Newark association*

Deep, well-drained and somewhat poorly drained, nearly level soils; medium-textured to moderately fine textured subsoil; on flood plains and stream terraces

This association consists of a narrow strip of flood plains and stream terraces along Rolling Fork. The dominant soils formed in alluvium (fig. 4).

This association makes up about 6 percent of the county. Huntington soils occupy about 21 percent of the association; Lawrence soils, 19 percent; Newark soils, 17 percent; and minor soils, about 43 percent.

Huntington soils are on flood plains, near the stream channels. They are deep, loamy, well drained, and nearly neutral to medium acid. Newark soils are on the low parts of the flood plains. They are deep, loamy, somewhat poorly drained, and nearly neutral to medium acid. Lawrence soils, on stream terraces, are loamy, somewhat poorly drained, and very strongly acid. They have a slowly permeable fragipan, which limits the depth to which roots can penetrate.

Minor soils are Lindside and Bedford soils, which are moderately well drained; Melvin and Robertsville soils, which are poorly drained; and Trimble and Whitley soils, which are well drained. Bedford and Robertsville soils have fragipans.

Most farms are owner operated. Raising of livestock, mainly beef cattle and hogs, is an important farm enterprise. Nearly all the acreage is cleared. The well-drained soils are used intensively for row crops, principally corn. The poorly drained soils are more commonly used for hay and pasture. Soybeans are grown on some farms. Tobacco and popcorn are the chief cash crops, but the acreage of these crops is comparatively small.

This association is well suited to cultivated crops. Rolling Fork is a potential source of water for irrigation. Wetness is the main limitation; it can be reduced by artificial drainage.

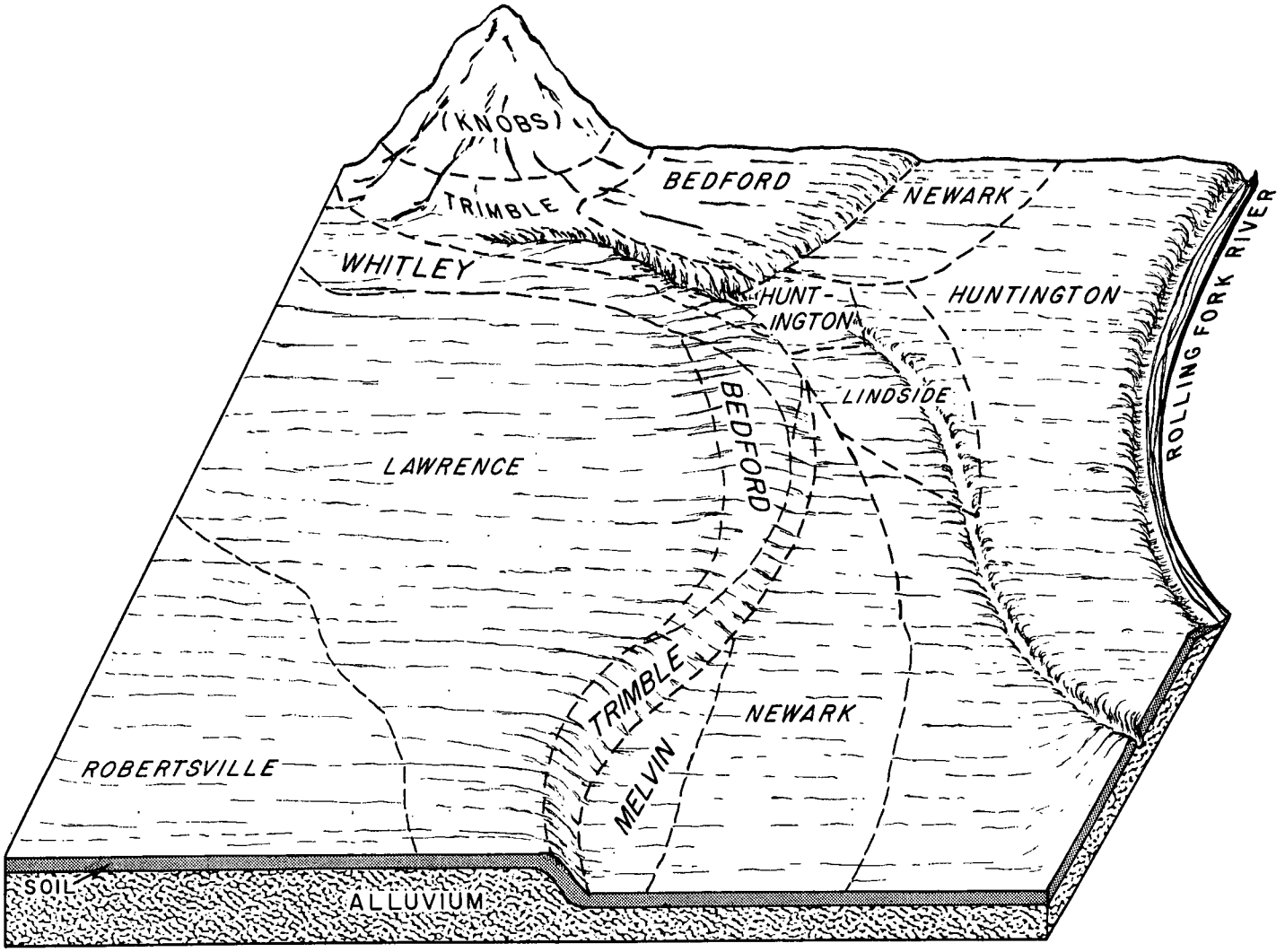

Figure 4.—Typical pattern of soils, topography, and parent material in association 2.

3. *Rockcastle-Colyer-Trappist association*

Shallow, excessively drained, strongly sloping to steep soils, and moderately deep, well-drained, gently sloping to strongly sloping soils; fine textured to moderately fine textured subsoil; on shale uplands

This association consists of long narrow ridges, steep valley walls, knobs, and somewhat narrow, sloping valley floors. The slopes are deeply dissected by creeks and drainageways. Some peaks are more than 700 feet above the valley floor. The dominant soils of the association formed in residuum weathered from black and gray, acid shale (fig. 5).

This association makes up about 28 percent of the county. Rockcastle soils occupy about 22 percent of the association; Colyer soils, 18 percent; Trappist soils, 17 percent; and minor soils, about 43 percent.

Rockcastle soils, on strongly sloping to steep hillsides above Colyer soils, are shallow and moderately deep. They have a clayey subsoil and are droughty and very strongly acid. Colyer soils are on the lower parts of hillsides, on knobs, and on the lower ridges. They are shallow over black shale bedrock and are loamy, droughty, and very strongly acid. Trappist soils are on the gentle to strong slopes of knobs, on moderately broad, low ridges, and on foot slopes. They are moderately deep over shale bedrock, and they have a clayey subsoil. They are well drained and very strongly acid.

Minor soils on the lower parts of the uplands are the moderately well drained Tilsit soils and the somewhat poorly drained Lawrence soils. Huntington soils dominate the narrow flood plains, and Trimble and Whitley soils occur on some foot slopes. Other minor soils are Baxter, Zanesville, Weikert, Corydon, and Beasley.

Most farms are operated by their owners, some of whom are part-time farmers. Raising beef cattle is the main livestock enterprise, although there is some dairy farming. Corn and tobacco are the main row crops, but the acreage of these crops is comparatively small. Tobacco is the chief cash crop. Hay and pasture are grown on most of the cleared farmland.

Some of the acreage that was farmed in the past is

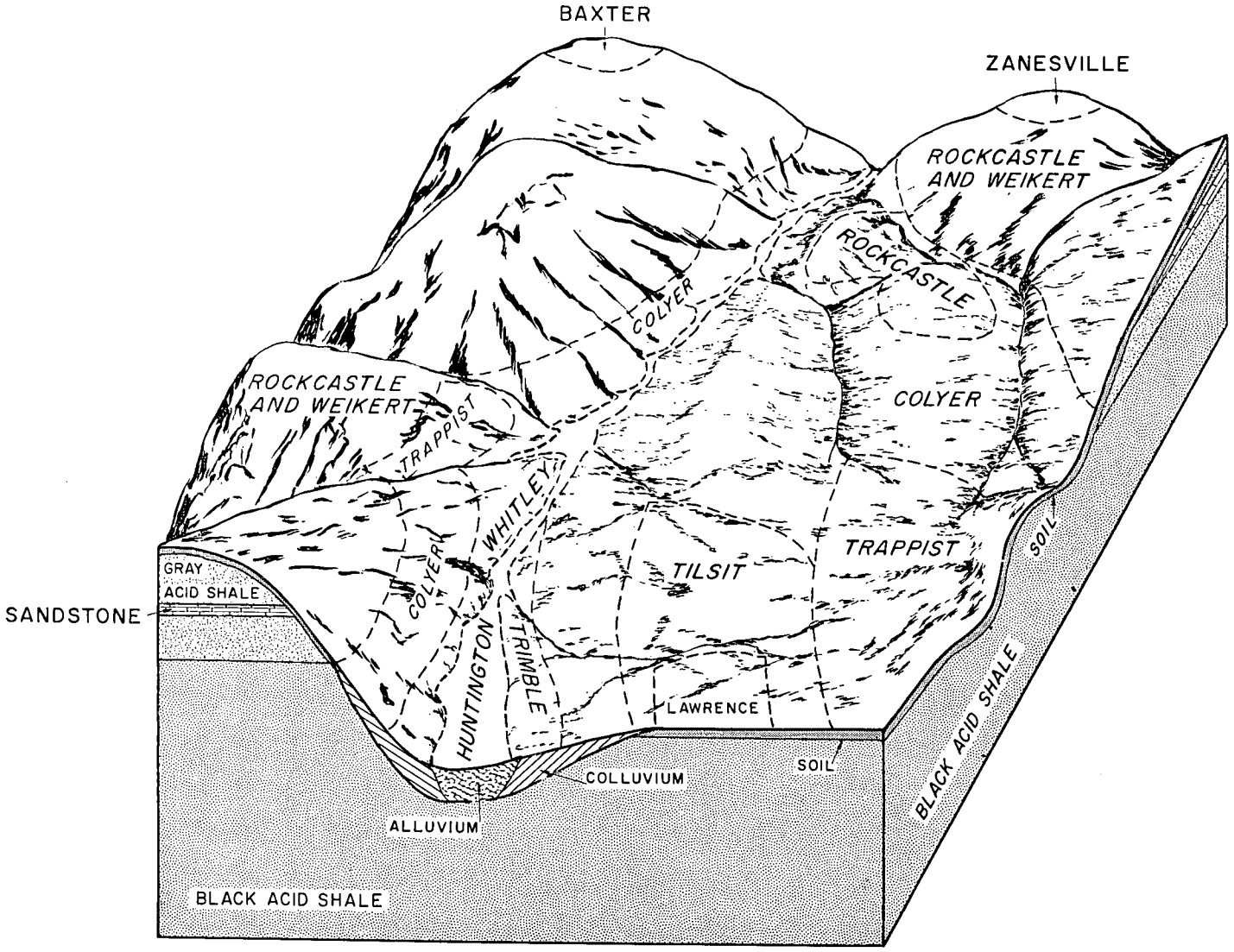

Figure 5.—**Typical pattern of soils, topography, and parent materials in association 3.**

covered with young stands of Virginia pine, but the dominant trees are oaks and hickory. Idle land and brush thickets are fairly common.

The narrow valleys and deep drains provide numerous sites that are suitable for impoundments. Suitable sites are also available for summer homes, riding trails, and numerous other recreational facilities. Some summer resorts and recreation enterprises have been developed in this heavily wooded and scenic part of the county. Gravel for surfacing rural roads is obtained from deposits along the streams.

This association is better suited to forest, wildlife habitat, and recreation than it is to farming. A large percentage of the acreage has remained forested because of the steep slopes, rough topography, and low productivity of the soils.

Soils of the Outer Bluegrass Region

The topography of this region is one of a nearly level to steep upland that is dissected by moderately deep to deep drainageways and narrow valleys. Burley tobacco is the main cash crop. Corn and pasture and hay plants are grown extensively and are fed to the cattle on the farms on which they are grown. Some of the steep hillsides are wooded, and a few ridges have small woodlots.

4. *Pembroke-Beasley-Corydon association*

Deep to shallow, well-drained and somewhat excessively drained, nearly level to moderately steep soils; moderately fine textured to fine textured subsoil; on limestone uplands

This association consists of ridges that are nearly level to strongly sloping and narrow valleys that have moderately steep to steep walls. The dominant soils in this association formed in material weathered from limestone and calcareous shale (fig. 6). In places this material contained a little loess.

This association extends from Bardstown northwest and southeast to the county line. It makes up about 26 percent of the county. Pembroke soils occupy about 33 percent of the association; Beasley soils, 14 percent; Corydon soils, 13 percent; and minor soils, about 40 percent.

Pembroke soils are on nearly level to broad, sloping

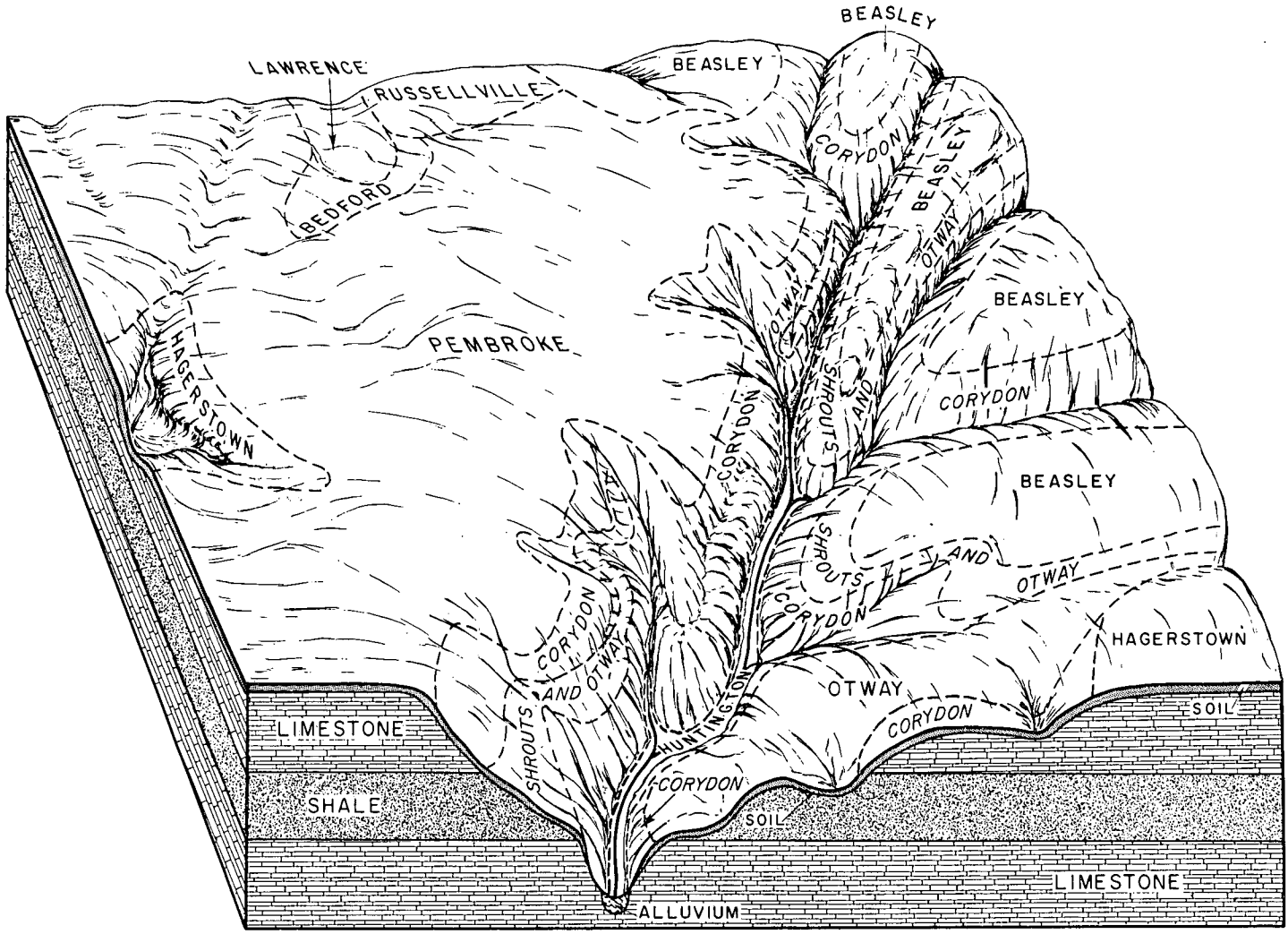

Figure 6.—**Typical pattern of soils, topography, and parent material in association 4.**

ridges. They are deep, loamy, and well drained. The reaction is slightly acid to strongly acid. Beasley soils are on gently to strongly sloping ridges and side slopes. They are deep to moderately deep over calcareous shale, and they have a clayey subsoil. They are well drained. The reaction is medium acid to strongly acid in the horizons above the shale. Corydon soils are on gently sloping to steep ridges and valley walls. They are shallow to moderately deep to limestone bedrock, and they have a clayey subsoil. They are somewhat excessively drained. In places they are rocky. The reaction is medium acid to moderately alkaline.

Minor soils are the well-drained Hagerstown soils and the moderately well drained Bedford soils; the well drained Huntington soils and the somewhat poorly drained Newark soils, which are dominant on narrow flood plains; and the somewhat excessively drained Otway and Shrouts soils, which are on most of the remaining uplands.

Most farms are owner operated, and some are large enough to require the assistance of one or two tenants. Most of the acreage is cleared. The remaining woodland is in small woodlots and on the steeper slopes. Raising livestock, mainly beef cattle, dairy cattle, and hogs, is the main farm enterprise.

All of the common crops are grown, including corn, tobacco, small grains, alfalfa, red clover, and lespedeza. Orchardgrass and Kentucky 31 fescue are the chief pasture grasses. The steeper soils are not suited to row crops because the erosion hazard is very severe.

Water is furnished by streams, springs, wells, and farm ponds.

The county's major source of agricultural lime and crushed limestone for road construction is in the association. Most of the whisky distilling plants in the county are here.

5. *Lowell-Fairmount-Shelbyville association*

Deep, well-drained, undulating to rolling soils, and shallow, somewhat excessively drained, sloping to steep soils; fine textured to moderately fine textured subsoil; on limestone and shale uplands

This association consists of gentle to steep slopes, moderately deep to deep draws, and narrow valleys. The dominant soils formed in material that weathered from thin-bedded limestone and shale. In places this material contained little loess (fig. 7).

This association makes up 30 percent of the county. Lowell soils occupy about 50 percent of the association; Fairmount soils, 14 percent; Shelbyville soils, 12 percent; and minor soils, about 24 percent.

Lowell soils are on gently to strongly sloping ridgetops and side slopes. They are deep, and they have a clayey subsoil. They are well drained and acid. Fairmount soils are on sloping to steep hillsides. They are shallow over bedrock and are clayey, droughty, and nearly neutral to alkaline. Shelbyville soils are on gently sloping ridgetops. They are deep, loamy, well drained, and acid.

Minor soils are the Nicholson and Faywood soils, which are on uplands, and the well drained Huntington,

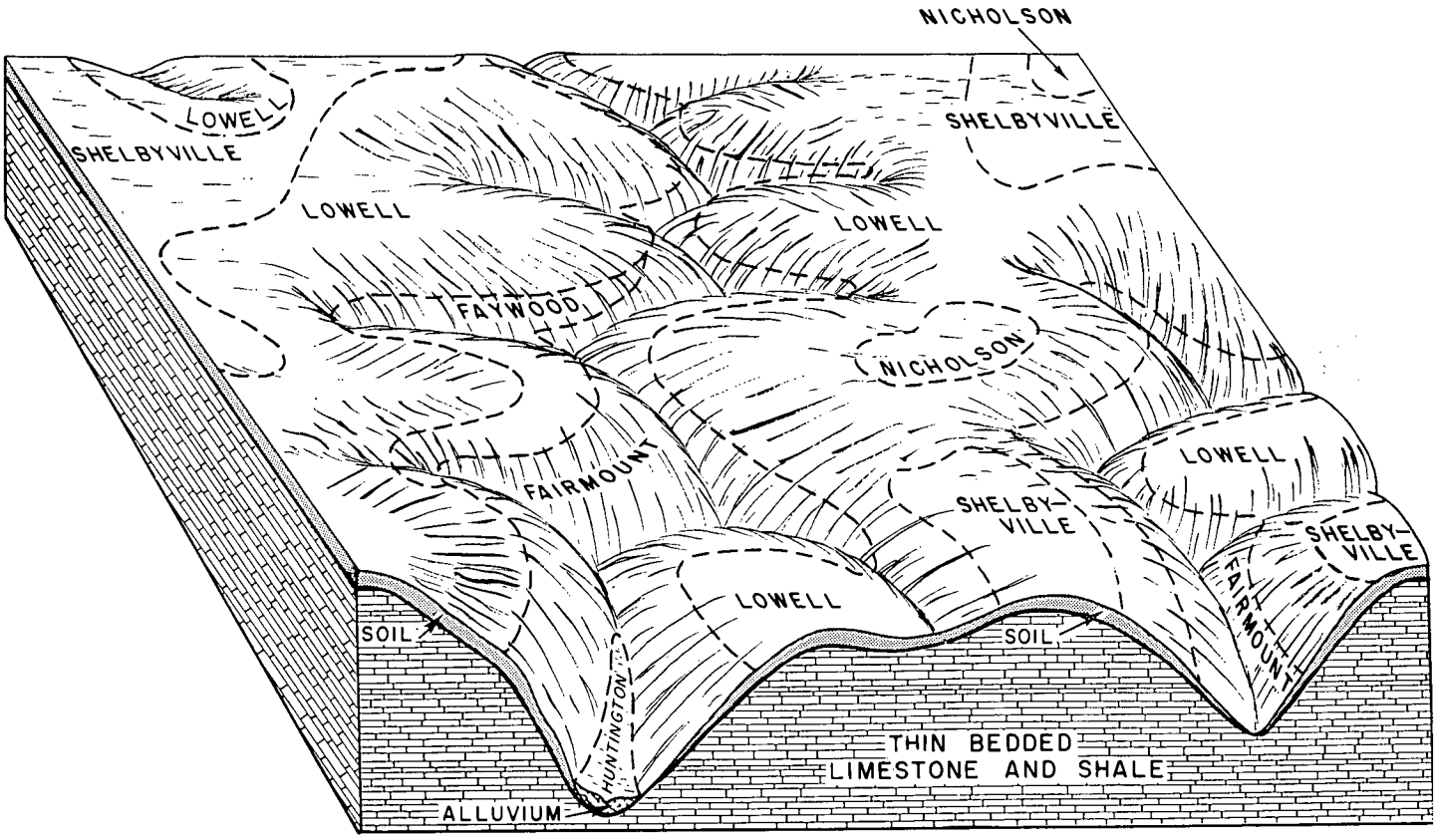

Figure 7.—**Typical pattern of soils, topography, and parent material in association 5.**

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Elk, and Woolper soils, the moderately well drained Lindside soils, and the somewhat poorly drained Newark and Lawrence soils, all of which are in valleys.

Most farms are owner operated, but some are renter operated. Hired labor is common, and some owner operators have one or more tenants. Farms are larger, generally, than the average for the county. A large acreage is used for hay and pasture, but row crops are grown extensively on ridgetops and in valleys.

All of the common crops are grown, including corn, tobacco, alfalfa, red clover, lespedeza, and small grains. Orchardgrass and Kentucky bluegrass are the chief pasture grasses. Raising of livestock, mainly beef cattle, dairy cattle, and hogs, is an important farm enterprise.

This association has the potential to support a major livestock enterprise. Most of the acreage is cleared, and the remaining woodland is in small woodlots and on the steeper slopes. The main sources of water are streams, farm ponds, and cisterns. Soils suitable for hay and pasture are abundant, but soils suitable for intensive cultivation are of limited extent. Soils on the steeper slopes are not suited to row crops because the erosion hazard is very severe.

Soils of the Hills of the Bluegrass Region

The topography of this region is one of steep, convex hillsides, narrow valleys, and long, narrow, fingering ridgetops (fig. 8). Burley tobacco is the main cash crop. Pasture and hay plants are the chief crops, but some corn is also grown. Some of the slopes are wooded, and brushland is common.

6. Eden-Lowell association

Deep, well-drained, sloping to steep soils; fine-textured subsoil; on highly dissected limestone and shale uplands

This association consists of long, narrow, fingered ridges dissected by crooked drains that form deep, narrow valleys. These ridges commonly are as much as 200 feet high. The steep hillsides are conspicuous. The dominant soils in this association formed in material that weathered from thin-bedded limestone, calcareous shale, and siltstone (fig. 9).

This association makes up about 8 percent of the county. Eden soils occupy about 60 percent of the association; Lowell soils, 20 percent; and minor soils, about 20 percent.

Eden soils, on strongly sloping to steep hillsides, are clayey, well drained, somewhat droughty, and slightly acid to moderately alkaline. In some places they contain flagstones. Lowell soils, on the tops of ridges and on the upper part of the slopes of sides, are deep. They have clayey subsoils. They are well drained and acid.

Minor soils on uplands are the well drained to moderately well drained Nicholson soils and the well drained Faywood soils. The Huntington, Newark, Elk, Bedford, and Lawrence soils are in valleys.

About 90 percent of the acreage has been cleared, but small, scattered timber stands remain, mostly on steep slopes. Brushland and young stands of redcedar and locust are common.

The hillsides are used for pasture that consists chiefly of bluegrass and Kentucky 31 fescue. Alfalfa is the chief hay crop. Corn and tobacco, the chief row crops,

Figure 8.—**Landscape in the Hills of the Bluegrass Region. Lowell and Faywood soils on ridgetops, and Eden soils on hillsides.**

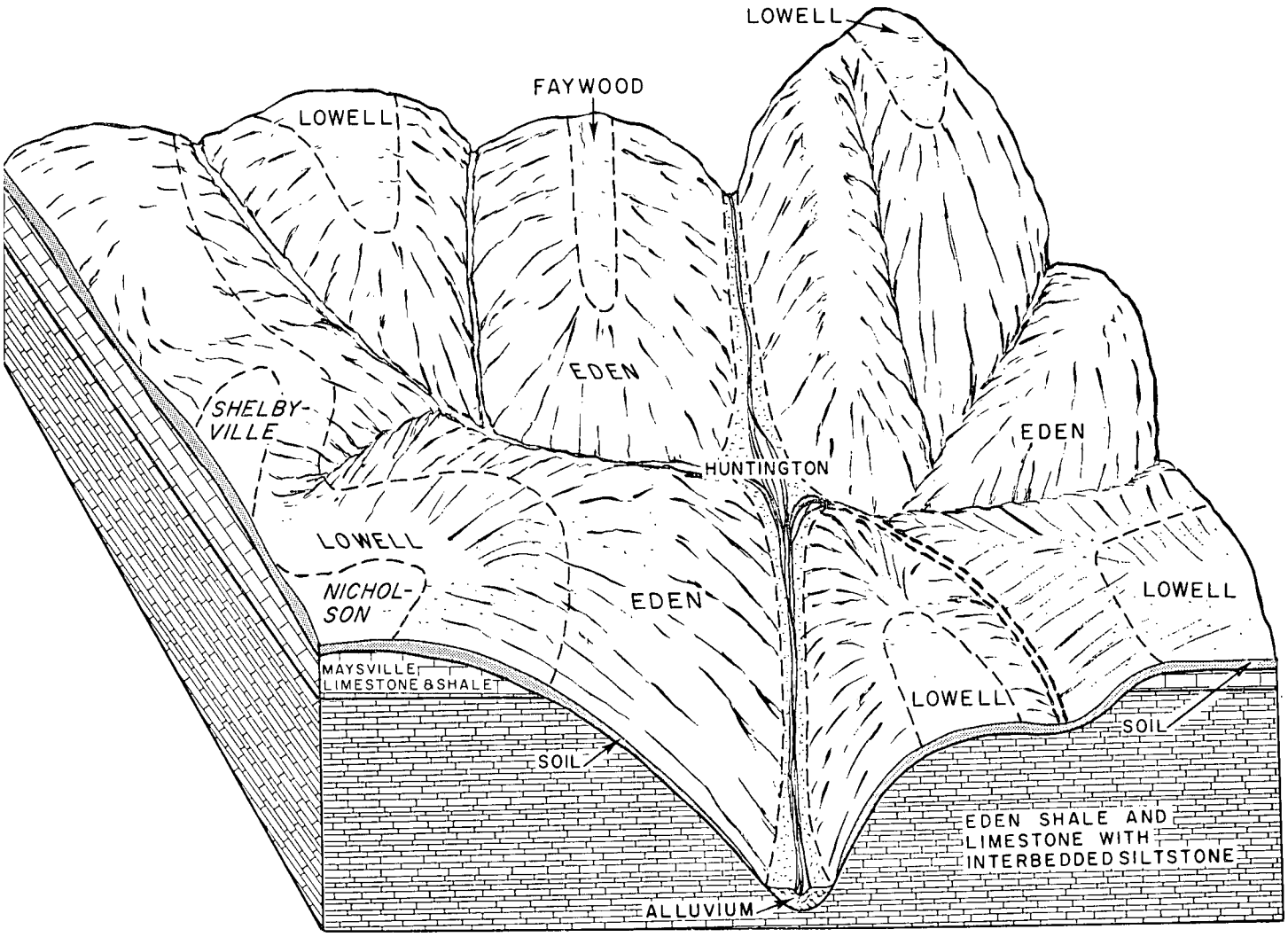

Figure 9.—**Typical pattern of soils, topography, and parent material in association 6.**

are grown on the tops of ridges and in the valleys. The predominant livestock enterprise is dairy farming.

This association has a good potential for large livestock enterprises; it can provide large amounts of hay and forage. Other potential uses are orchards and vineyards, forests, and recreation. One shooting preserve has been established in the association. The major sources of water are streams, farm ponds, and cisterns.

Because the erosion hazard is very severe, the steeper soils are unsuitable for row crops. Soils on ridgetops and in valleys are suited to cultivation, but the acreage is small. Some of the steepest areas are better suited to woodland and wildlife than to hay and pasture.

Descriptions of the Soils

In this section the soils of Nelson County are described in detail. The procedure is to describe first the soil series and then the mapping units in that series. Thus, to get full information on any one mapping unit, it is necessary to read both the description of that unit and the description of the soil series to which the unit belongs.

Each series description contains a short description of a soil profile considered representative of the series and a much more detailed description of the same profile that scientists, engineers, and others can use in making highly technical interpretations. If the profile of a given mapping unit differs from this representative profile, the differences are stated in the description of the mapping unit, unless they are apparent from the name of the mapping unit. Many of the terms used in describing soil series and mapping units are defined in the Glossary, and some are defined in the section "How This Survey Was Made."

The approximate acreage and proportionate extent of the soils are shown in table 1. At the back of this publication is the "Guide to Mapping Units," which lists the mapping units in the county and shows the capability unit and woodland group each is in. It also shows the

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

Soil	Area	Extent	Soil	Area	Extent
	Acres	*Percent*		*Acres*	*Percent*
Baxter cherty silt loam, 12 to 20 percent slopes	2,215	0.8	Lowell silty clay loam, 6 to 12 percent slopes, severely eroded	4,475	1.6
Beasley silt loam, 2 to 6 percent slopes	1,655	.6	Lowell silty clay loam, 12 to 20 percent slopes, severely eroded	1,255	.5
Beasley silt loam, 6 to 12 percent slopes, eroded	5,155	1.8	Markland silt loam, 2 to 12 percent slopes	225	.1
Beasley silt loam, 12 to 20 percent slopes, eroded	1,470	.5	Markland silt loam, 12 to 20 percent slopes, eroded	170	.1
Beasley silty clay loam, 6 to 12 percent slopes, severely eroded	1,830	.7	Markland silty clay, 6 to 12 percent slopes, severely eroded	455	.2
Beasley silty clay loam, 12 to 20 percent slopes, severely eroded	1,450	.5	Markland silty clay, 12 to 20 percent slopes, severely eroded	195	.1
Bedford silt loam, 0 to 2 percent slopes	410	.2	McGary silt loam	2,185	.8
Bedford silt loam, 2 to 6 percent slopes	4,765	1.7	Melvin silt loam	755	.3
Bedford silt loam, 6 to 12 percent slopes, eroded	1,335	.5	Newark silt loam	5,425	1.9
Colyer silt loam, 6 to 20 percent slopes	2,795	1.0	Nicholson silt loam, 2 to 6 percent slopes	6,360	2.2
Colyer shaly silt loam, 20 to 50 percent slopes	9,640	3.5	Otway silty clay loam, 6 to 12 percent slopes	1,165	.4
Colyer shaly silty clay loam, 6 to 30 percent slopes, severely eroded	1,730	.6	Otway silty clay loam, 12 to 30 percent slopes	2,195	.8
Corydon silt loam, 2 to 6 percent slopes	325	.1	Pembroke silt loam, 0 to 2 percent slopes	2,520	.9
Corydon silt loam, 6 to 12 percent slopes, eroded	1,225	.6	Pembroke silt loam, 2 to 6 percent slopes	16,900	6.0
Corydon silt loam, 12 to 20 percent slopes, eroded	380	.1	Pembroke silt loam, 6 to 12 percent slopes	4,235	1.5
Corydon silty clay, 6 to 20 percent slopes, severely eroded	935	.3	Pembroke silty clay loam, 6 to 12 percent slopes, severely eroded	630	.2
Corydon very rocky silt loam, 6 to 20 percent slopes, eroded	1,510	.5	Robertsville silt loam	2,210	.8
Corydon very rocky silty clay, 12 to 30 percent slopes, severely eroded	3,780	1.4	Rockcastle silt loam, 12 to 20 percent slopes	1,510	.5
Crider silt loam, 6 to 12 percent slopes	310	.1	Rockcastle silt loam, 20 to 50 percent slopes	7,585	2.7
Dunning silty clay loam	110	(1)	Rockcastle shaly silty clay, 12 to 30 percent slopes, severely eroded	750	.3
Eden silty clay loam, 30 to 50 percent slopes, eroded	645	.2	Rockcastle-Weikert complex, 20 to 50 percent slopes	14,310	5.1
Eden silty clay, 6 to 12 percent slopes, severely eroded	1,185	.4	Rock land-Corydon complex	9,305	3.3
Eden silty clay, 12 to 30 percent slopes, severely eroded	8,745	3.1	Russellville silt loam, 0 to 2 percent slopes	195	.1
Eden flaggy clay, 20 to 30 percent slopes, severely eroded	2,090	.7	Russellville silt loam, 2 to 6 percent slopes	1,465	.5
Eden flaggy clay, 30 to 50 percent slopes, severely eroded	1,095	.4	Shelbyville silt loam, 2 to 6 percent slopes	10,720	3.8
Elk silt loam, 0 to 2 percent slopes	360	.1	Shrouts-Otway complex, 6 to 12 percent slopes	1,355	.5
Elk silt loam, 2 to 6 percent slopes	565	.2	Shrouts-Otway complex, 12 to 30 percent slopes	5,450	2.0
Elk silt loam, 6 to 12 percent slopes	265	.1	Tilsit silt loam, 2 to 6 percent slopes	3,730	1.3
Fairmount silty clay loam, 6 to 20 percent slopes	415	.2	Tilsit silt loam, 6 to 12 percent slopes, eroded	390	.1
Fairmount flaggy silty clay loam, 12 to 30 percent slopes	2,050	.7	Trappist silt loam, 2 to 6 percent slopes	1,900	.7
Fairmount flaggy clay, 6 to 20 percent slopes, severely eroded	4,770	1.7	Trappist silt loam, 2 to 6 percent slopes, eroded	1,180	.4
Fairmount flaggy clay, 20 to 50 percent slopes, severely eroded	6,265	2.2	Trappist silt loam, 6 to 12 percent slopes	1,815	.7
Faywood silty clay loam, 6 to 12 percent slopes, eroded	1,065	.4	Trappist silt loam, 6 to 12 percent slopes, eroded	5,365	1.9
Faywood silty clay loam, 12 to 20 percent slopes, eroded	1,745	.6	Trappist silt loam, 12 to 20 percent slopes	1,255	.5
Faywood silty clay, 6 to 20 percent slopes, severely eroded	2,000	.7	Trappist silt loam, 12 to 20 percent slopes, eroded	1,890	.7
Gullied land, acid shaly materials	430	.2	Trappist silty clay loam, 6 to 12 percent slopes, severely eroded	455	.2
Gullied land, calcareous shaly materials	1,715	.6	Trappist silty clay loam, 12 to 20 percent slopes, severely eroded	700	.3
Hagerstown silt loam, 2 to 6 percent slopes	550	.2	Trimble cherty silt loam, 2 to 6 percent slopes	210	.1
Hagerstown silt loam, 6 to 12 percent slopes	780	.3	Trimble cherty silt loam, 6 to 12 percent slopes	1,255	.4
Hagerstown silty clay loam, 6 to 20 percent slopes, severely eroded	240	.1	Trimble cherty silt loam, 12 to 20 percent slopes	825	.3
Huntington silt loam, 0 to 4 percent slopes	10,515	3.7	Trimble cherty silty clay loam, 12 to 20 percent slopes, severely eroded	245	.1
Huntington silt loam, 4 to 12 percent slopes	1,945	.7	Whitley silt loam, 2 to 6 percent slopes	495	.2
Huntington silt loam, gravelly variant	1,175	.4	Whitley silt loam, 6 to 12 percent slopes	1,925	.7
Lawrence silt loam	6,445	2.3	Whitley silt loam, 12 to 20 percent slopes	1,140	.4
Lindside silt loam	2,710	1.0	Woolper silty clay loam, 2 to 6 percent slopes	1,080	.4
Lowell silt loam, 2 to 6 percent slopes	10,705	3.8	Woolper silty clay loam, 6 to 12 percent slopes	735	.3
Lowell silt loam, 6 to 12 percent slopes, eroded	30,260	10.7	Woolper silty clay loam, 12 to 20 percent slopes, eroded	285	.1
Lowell silt loam, 12 to 20 percent slopes, eroded	2,460	.9	Zanesville silt loam, 2 to 6 percent slopes	925	.3
			Zanesville silt loam, 6 to 12 percent slopes, eroded	290	.1
			Water	1,475	.5
			Total	279,780	100.0

[1] Less than 0.05 percent.

pages on which the mapping units and the capability units and the woodland groups are described.

Baxter Series

The Baxter series consists of well-drained cherty soils that have a red, clayey subsoil. These soils developed in residuum weathered from cherty limestone.

In a representative profile, the surface layer is mainly brown cherty silt loam about 7 inches thick. The subsoil to a depth of 60 inches or more is mainly cherty silty clay. It is yellowish red in the upper part and red to dark red below a depth of about 28 inches.

The natural fertility of these soils is moderate, the organic-matter content is medium, and the reaction is strongly acid to very strongly acid. Permeability is moderate, and the available moisture capacity is moderate. The root zone is deep. The chert in the surface layer hinders cultivation.

Baxter soils occupy the tops and sides of ridges in the southern part of Nelson County. Nearly all the acreage is woodland. Oak and hickory are dominant.

Representative profile of Baxter cherty silt loam, 12 to 20 percent slopes:

O1—2 inches to 0, partly decayed leaves and twigs.

A1—0 to 1 inch, dark grayish-brown (10YR 4/2) cherty silt loam (20 percent chert); weak, fine, granular structure; very friable when moist; strongly acid; abrupt, smooth boundary.

A2—1 to 7 inches, brown (10YR 5/3) cherty silt loam (20 percent chert); weak, fine, granular structure; very friable when moist; strongly acid; clear, wavy boundary.

B1t—7 to 10 inches, yellowish-red (5YR 5/6) cherty silty clay loam (25 percent chert); moderate, medium, angular blocky structure; firm when moist; few, small, round concretions that are hard and black; few clay films; root openings filled with silt loam are common; very strongly acid; gradual, smooth boundary.

B21t—10 to 22 inches, yellowish-red (5YR 4/6) cherty silty clay (30 percent chert); strong, medium, angular blocky structure; very firm when moist, sticky and plastic when wet; common clay films; very strongly acid; gradual, smooth boundary.

B22t—22 to 28 inches, yellowish-red (5YR 4/6) cherty silty clay (30 percent chert); few, fine, distinct, pale-brown (10YR 6/3) mottles; strong, medium and fine, angular blocky structure; very firm when moist, sticky and plastic when wet; common clay films; very strongly acid; gradual, boundary.

B31t—28 to 34 inches, red (2.5YR 4/6) cherty silty clay (33 percent chert); few, fine, distinct mottles of pale brown (10YR 6/3) and light gray (10YR 7/2); moderate, medium, angular blocky structure; very firm when moist, sticky and plastic when wet; few clay films; very strongly acid; gradual, smooth boundary.

B32t—34 to 60 inches +, dark-red (10YR 3/6) cherty silty clay (38 percent chert); common distinct variegations of red (2.5YR 4/6), light yellowish brown (10YR 6/4), and pinkish gray (5YR 7/2); weak, medium, angular blocky structure; sticky and plastic when wet.

In many places the A horizon is very strongly acid. The lower part of the B horizon in some profiles is clay. At a greater depth than that described in the preceding description, many profiles have a C horizon of red, yellow, and gray clay between the solum and the bedrock. The chert content of the profile ranges from 15 to 40 percent. The solum is 50 to 70 inches thick, and the depth to bedrock is 5 to 8 feet. In a few areas there are scattered outcrops of bedrock.

Baxter soils are associated with Crider and Weikert soils. They have a finer textured subsoil than Crider soils, and they are more cherty throughout. Baxter soils are deeper to bedrock than Weikert soils. They have a redder, thicker, and finer textured subsoil than Weikert soils, and they have a horizon of clay accumulation, which Weikert soils lack.

Baxter cherty silt loam, 12 to 20 percent slopes (BaD).—This soil occurs on the tops of narrow ridges and as long, narrow bands on the sides of ridges. Included in mapping was a small acreage of Crider soils.

Because erosion is a severe hazard, this soil should be cultivated only occasionally. It is better suited to hay and pasture than to cultivated crops. Most grasses and legumes can be grown. Most of the acreage is wooded. (Capability unit IVe–3; woodland group 1)

Beasley Series

The Beasley series consists of well-drained soils that have a mainly clayey, moderately slowly permeable subsoil. These soils developed in residuum weathered from limestone and calcareous shale.

A representative profile in an area that is no more than moderately eroded has a surface layer of dark grayish-brown silt loam about 5 inches thick. The subsoil, about 28 inches thick, is strong-brown clay to silty clay loam. Below this is light-gray calcareous clay and at a depth of about 45 inches is calcareous shale.

The largest acreages of Beasley soils in Nelson County are in an area that extends from Bardstown southeast to Botland and northwest to the county line. Smaller areas occur at the lower elevations in the Knobs Region. Most of the acreage is used for row crops and pasture. About 20 percent is wooded, mainly with hickory, oak, and redcedar. A small part is idle.

Representative profile of Beasley silt loam, 6 to 12 percent slopes, eroded:

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable when moist; abundant roots; very strongly acid; clear, smooth boundary.

B21t—5 to 13 inches, strong-brown (7.5YR 5/6) heavy silty clay loam; moderate, medium, angular blocky structure; firm when moist, sticky when wet; common, medium, distinct, pale-brown (10YR 6/3) silt coatings on peds and in root channels; common roots; common clay films; few, small, round concretions that are hard and brown; strongly acid; clear, smooth boundary.

B22t—13 to 23 inches, strong-brown (7.5YR 5/6) silty clay; strong, medium, angular blocky structure; very firm when moist, very sticky when wet; common, pale-brown (10YR 6/3) silt coatings on peds; common roots; abundant clay films; few, small, round concretions that are hard and brown; strongly acid; clear, wavy boundary.

B3—23 to 33 inches, strong-brown (7.5YR 5/6) clay; many, coarse, pale-brown (10YR 6/3) and common, fine, distinct, yellowish-red (5YR 4/6) mottles; weak, medium, angular blocky structure; very firm when moist, very sticky when wet; few roots; small, round concretions that are hard and brown; strongly acid; clear, wavy boundary.

IIC—33 to 45 inches, light-gray (2.5Y 7/2) clay; many, coarse, distinct mottles of light yellowish brown (2.5Y 6/4) and few, strong-brown mottles (7.5YR 5/6); massive, or relict weak, thick, platy structure; firm when moist, sticky when wet; few white streaks and lime nodules; few weathered shale fragments; calcareous; gradual, wavy boundary.

IIR—45 to 53 inches +, light olive-brown (2.5Y 5/4), slightly weathered shale; common, medium, yellowish-brown (10YR 5/6) mottles; many lime nodules; calcareous.

The Ap horizon ranges from silt loam to silty clay loam in texture. In color it ranges from 10YR to 7.5YR in hue, 4 to 5 in value, and 2 to 6 in chroma.

The color of the B horizon ranges from 10YR to 5YR in hue,

4 to 5 in value, and 4 to 8 in chroma. The upper part of the B horizon is silty clay loam to silty clay, and the lower part is silty clay or clay. The reaction of the upper part of the B horizon is commonly strongly acid, but that of the lower part is medium acid to mildly alkaline.

The IIC horizon is clay to sandy clay loam. The color of this horizon ranges from 2.5Y to 7.5YR in hue, 5 to 7 in value, and 1 to 6 in chroma.

The solum generally is about 23 to 36 inches thick. The depth to unweathered shale is about 40 to 60 inches. In some places the profile has a small amount of chert in the uppermost part.

Beasley soils are associated with Pembroke, Hagerstown, Corydon, Otway, and Bedford soils. Beasley soils differ from Hagerstown and Pembroke soils chiefly in having a less red and slightly more clayey subsoil and in having a substratum of calcareous clay. They have a lighter colored and more acid surface layer than Otway soils and a redder and thicker B horizon that includes layers of clay acumulation. Beasley soils have a more clayey subsoil than Bedford soils, and they lack the fragipan that is characteristic of Bedford soils. They have a thicker but less red subsoil than Corydon soils, which overlie hard limestone.

Beasley silt loam, 2 to 6 percent slopes (BeB).—This soil occurs on narrow ridgetops. It has a thicker plow layer than that in the profile described as representative for the series. Included in mapping were small areas of Bedford and Hagerstown soils and of moderately eroded Beasley soils.

The natural fertility of this soil is moderately high, the organic-matter content is medium, and the reaction is strongly acid. The available moisture capacity is high. The plow layer is easy to till, and the root zone is deep.

This soil is suited to most of the commonly grown crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–2; woodland group 2)

Beasley silt loam, 6 to 12 percent slopes, eroded (BeC2).—This soil occurs on slightly convex ridgetops and side slopes. It has the profile described as representative for the series. As a result of moderate erosion, the plow layer is partly subsoil. Included in mapping were small areas of Bedford soils, of Hagerstown soils, and of severely eroded and uneroded Beasley soils.

The natural fertility of this soil is moderately high, the organic-matter content is low, and the reaction is strongly acid. The available moisture capacity is high. The plow layer is easy to till, in spite of the low organic-matter content, and the root zone is deep.

This soil is suited to most of the commonly grown crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–2; woodland group 2)

Beasley silt loam, 12 to 20 percent slopes, eroded (BeD2).—This soil occurs on the upper part of slightly convex slopes. As a result of moderate erosion, the plow layer consists partly of subsoil. Included in mapping were small areas of Otway soils, of Corydon soils, and of severely eroded and uneroded soils.

The natural fertility of this soil is moderately high, the organic-matter content is low, and the reaction is strongly acid. The available moisture capacity is high. The plow layer is easy to till, despite the low organic-matter content, and the root zone is deep.

A cultivated crop should be grown only occasionally because the erosion hazard is very severe. Hay and pasture are better suited. Most grasses and legumes can be grown. (Capability unit IVe–3; woodland group 2)

Beasley silty clay loam, 6 to 12 percent slopes, severely eroded (BlC3).—This soil has slightly convex slopes. It occurs as somewhat narrow strips on ridges and on the upper part of slopes. It has a finer textured and lighter colored plow layer and a thinner B horizon than the soil described as having the representative profile. As a result of erosion, the plow layer consists mostly of subsoil. Included in mapping were small areas of Corydon and Shrouts soils and of moderately eroded Beasley soils.

The natural fertility of this soil is moderate, the organic-matter content is very low, and the reaction is strongly acid. The available moisture capacity is moderate. The plow layer is very low in organic-matter content and is difficult to till. It can be tilled only within a somewhat narrow range of moisture content without clodding or crusting. The root zone is moderately deep.

This soil is suited to most of the common crops. It is better suited to hay or pasture than to cultivated crops because the erosion hazard is very severe. (Capability unit IVe–11; woodland group 3)

Beasley silty clay loam, 12 to 20 percent slopes, severely eroded (BlD3).—This soil occurs on ridges. It has a finer textured and lighter colored plow layer and a thinner B horizon than the soil described as having the representative profile. As a result of erosion, the plow layer consists mostly of the clayey subsoil. Included in mapping were small areas of Corydon and Shrouts soils and of moderately eroded Beasley soils.

The natural fertility is moderate, the organic-matter content is very low, and the reaction is strongly acid. The available moisture capacity is moderate. The plow layer is very low in organic-matter content and is somewhat difficult to till. The range of moisture content within which the plow layer can be tilled without clodding and crusting is somewhat narrow. The root zone is moderately deep.

This soil is unsuited to cultivated crops because of the effects of erosion and the hazard of additional erosion. It is suited to most pasture crops, but stands are often difficult to establish and maintain. (Capability unit VIe–2; woodland group 3)

Bedford Series

The Bedford series consists of moderately well drained soils that contain a fragipan. These soils developed in old alluvium on stream terraces and in loess underlain by residuum weathered from limestone on the uplands.

In a representative profile, the plow layer is brown silt loam about 7 inches thick. The subsoil is about 30 inches thick. The upper part is yellowish-brown silty clay loam to silt loam, and the lower part is a fragipan of mottled light yellowish-brown, light-gray, and yellowish-brown silt loam. The substratum, at a depth of about 37 inches, is mottled yellowish-brown, light-gray, brownish-yellow, and gray silt loam or light silty clay loam.

Permeability is moderate above the fragipan but slow in the fragipan. The available moisture capacity is moderate. The plow layer is easy to till, and it can be tilled

over a fairly wide range of moisture content without clodding or crusting. The reaction is very strongly acid.

Soils of the Bedford series are most extensive in the western part of the county. Most of the acreage is cleared and used for row crops, hay, and pasture. A small acreage is idle or in brushy thickets. There are several areas of woodland consisting chiefly of oak, hickory, maple, and Virginia pine.

Representative profile of Bedford silt loam, 2 to 6 percent slopes:

Ap—0 to 7 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; common roots; few, small, rounded pebbles; medium acid; clear, smooth boundary.

B1—7 to 11 inches, yellowish-brown (10YR 5/6) silt loam; weak, medium, subangular blocky structure; friable; few clay films; few worm casts; few organic stains; few pebbles; common roots; very strongly acid; gradual, smooth boundary.

B2t—11 to 23 inches, yellowish-brown (10YR 5/6) light silty clay loam; weak, medium, subangular blocky structure; firm; common clay films; few worm casts; few small pebbles; few roots; very strongly acid; clear, smooth boundary.

Bx—23 to 37 inches, mottled light yellowish-brown (2.5Y 6/4), light-gray (2.5Y 7/2), and yellowish-brown (10YR 5/6) heavy silt loam; weak, medium, subangular blocky structure; very firm; compact; brittle; few small pebbles; common, small, round, soft, brown concretions and concretionary stains; few clay films; very strongly acid; gradual, smooth boundary.

C—37 to 90 inches +, mottled yellowish-brown (10YR 5/6), light-gray (10YR 6/1), brownish-yellow (10YR 6/6), and gray (5Y 5/1) silt loam or light silty clay loam; weak, coarse and medium, angular blocky structure; firm; slightly compact; very strongly acid; common, small, soft, brown concretions; approximately 35 percent angular chert and gravel.

The Ap horizon has color values of 4 to 6 and chromas of 2 to 4. Profiles in undisturbed areas have a 1- to 2-inch A1 horizon of dark grayish-brown silt loam and a 6- to 8-inch A2 horizon of yellowish-brown silt loam. Some profiles lack a B1 horizon. The B2t horizon is silt loam to silty clay loam (clay content 18 to 35 percent). This horizon has color values of 5 and 6 and chromas of 4 to 6. In a few places the lower part of the B2t horizon is mottled with grayish brown and light gray. The Bx horizon is silt loam to silty clay loam (clay content 25 to 35 percent). In some profiles this horizon is mottled with brown, pale yellow, olive gray, and strong brown. The C horizon in some profiles is silty clay. This horizon is less cherty in the upland areas than in the areas on terraces.

The depth to the fragipan ranges from 18 to 26 inches. The solum is 34 to 44 inches thick, and the depth to bedrock ranges from 5 to 10 feet or more. In some places the upper part of the profile is 10 percent chert, and the percentage increases to as much as 40 percent below the fragipan.

Bedford soils are associated with Trimble, Whitley, Beasley, Russellville, and Lawrence soils. Bedford soils differ from Beasley soils in having a less red but coarser textured B horizon, in having a fragipan, and in being less well drained. Bedford soils have a more yellow B horizon and a more mottled and more compact fragipan than Russellville soils. They are better drained, have fewer mottles in the B horizon, and have a greater depth to the fragipan than Lawrence soils. Bedford soils differ from Trimble and Whitley soils in having more yellow hues, in being more mottled in the lower B horizon, and in having a fragipan. They are less cherty than Trimble soils.

Bedford silt loam, 0 to 2 percent slopes (BrA).—This soil is on uplands and stream terraces. The slopes are straight to slightly concave. Included in mapping were small areas of Lawrence soils.

The natural fertility is moderate, and the organic-matter content is medium. The seasonal high water table is at a depth of 1½ to 2 feet. Water often remains in depressions for several days after heavy rains. This soil is slow to dry out and to warm up in spring because of the fragipan and the seasonal high water table. The root zone is moderately deep.

This soil is suited to shallow-rooted crops that can tolerate the seasonal high water table. It is suited to most of the common crops but not to alfalfa and tobacco. The seasonal high water table is the main limitation. (Capability unit IIw–1; woodland group 5)

Bedford silt loam, 2 to 6 percent slopes (BrB).—This soil occurs on broad uplands and stream terraces. It has slightly convex slopes. It has the profile described as representative for the series. Included in mapping were small areas of Lawrence soils and a few of moderately eroded Bedford soils.

The natural fertility is moderate, and the organic-matter content is medium. This soil is somewhat slow to dry out and to warm up in spring because of the fragipan and the seasonal high water table. The root zone is moderately deep.

This soil is suited to most of the common crops but not to alfalfa. Alfalfa tends to die after 2 to 3 years because of the limited depth of the root zone and excessive wetness in spring. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–6; woodland group 5)

Bedford silt loam, 6 to 12 percent slopes, eroded (BrC2).—This soil occurs chiefly as narrow strips on convex slopes below the more nearly level Bedford soils. It has a lighter colored plow layer than the soil described as having the representative profile, and it is shallower to the fragipan. Included in mapping were small areas of soils that have a light brownish-gray plow layer and an olive-brown subsoil, of soils that are more than 15 percent gravel and chert throughout the profile, and of Bedford soils that are uneroded and severely eroded.

The natural fertility is moderate, and the organic-matter content is low. Because of the fragipan, the root zone is shallow.

This soil is suited to shallow-rooted crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–8; woodland group 5)

Colyer Series

The Colyer series consists of somewhat excessively drained soils that are shallow to bedrock. These soils developed chiefly in residuum weathered from black shale. Because of the influence of a thin mantle of loesslike material, Colyer soils in this county commonly have a less clayey B horizon than is typical.

A representative profile in an uneroded area has a surface layer of dark grayish-brown to brown silt loam about 7 inches thick. The subsoil is brown silty clay loam about 9 inches thick. Slightly weathered black shale is at a depth of about 16 inches.

The natural fertility is low, and the reaction is very strongly acid. Permeability is moderate.

Soils of the Colyer series occur on hillsides and knobs

in the southern and western parts of Nelson County. They are not important in farming, except for production of wood crops. Approximately 75 percent of the acreage is wooded, mainly with oak, hickory, and Virginia pine. Most of the cleared acreage is used for pasture or is idle and reverting to woodland.

Representative profile of Colyer silt loam, 6 to 20 percent slopes:

O1—1 inch to 0, slightly decayed leaves and twigs.
A1—0 to ½ inch, dark grayish-brown (2.5Y 4/2) silt loam; weak, fine, granular structure; very friable; few very small shale fragments; very strongly acid; abrupt, smooth boundary.
A2—½ inch to 7 inches, brown (10YR 5/3) silt loam; weak, fine and medium, subangular blocky structure; friable; few, very fine, strong-brown (7.5YR 5/6), weathered fragments of shale; common roots; very strongly acid; clear, smooth boundary.
B—7 to 16 inches, brown (7.5YR 5/4) silty clay loam; weak, medium, subangular blocky structure; firm; many weathered fragments of shale, strong brown (7.5YR 5/6) and reddish gray (5YR 5/2) in color; few roots; very strongly acid; abrupt, smooth boundary.
R—16 inches +, slightly weathered, highly fissile Devonian shale; outer surfaces brown (7.5YR 5/4) and interior along freshly broken surfaces dark reddish gray (5YR 4/2); at shallow depth is unweathered, black (5YR 2/1), acid shale.

The Ap horizon in plowed places is dark grayish brown to yellowish brown. In severely eroded places the texture is commonly shaly silty clay loam. Some profiles lack an A1 horizon. The color of the A2 horizon ranges in value from 4 to 6.

The color of the B horizon ranges from 10YR to 5YR in hue, from 4 to 5 in value, and from 4 to 6 in chroma. In texture the B horizon ranges from silt loam to silty clay.

The shale content of the profile is about 5 to 35 percent; it is least near the surface and increases with depth. The depth to shale bedrock is about 8 to 20 inches. Some profiles have a few chert and sandstone fragments in the uppermost part of the profile and on the surface.

Colyer soils are associated with Trimble, Whitley, Corydon, Trappist, and Rockcastle soils. Colyer soils lack the horizon of clay accumulation that is characteristic of Trimble, Whitley, Corydon, and Trappist soils, and they are shallower to bedrock than those soils. They are more acid than Corydon soils, and they lack the limestone outcrops that are characteristic of Corydon soils. They lack the chert content that is characteristic of Trimble soils. Colyer soils differ from Rockcastle soils in having more brown and less gray colors, in having a less clayey texture, and being derived from brittle black shale rather than from soft gray shale.

Colyer silt loam, 6 to 20 percent slopes (ChD).—This soil occurs on convex ridges and knobs. It has the profile described as representative of the series. Included in mapping were small areas of Trappist soils and a few areas of moderately eroded soils.

The organic-matter content is medium, and the available moisture capacity is low. The root zone is shallow to shale bedrock.

This soil is suited to pasture, woodland, and wildlife habitat. It is unsuited to cultivation because of the shallow root zone, droughtiness, and low natural fertility. Unless protective cover is maintained, the erosion hazard is very severe. (Capability unit VIs–3; woodland group 9)

Colyer shaly silt loam, 20 to 50 percent slopes (CmF).—This soil has convex slopes and is dissected by deep draws. Included in mapping were small areas of Rockcastle soils, areas of severely eroded soils, and some shale banks.

The organic-matter content is low, and the available moisture capacity is low. The root zone is shallow to shale bedrock.

This soil is suited to woodland and wildlife habitat. It can be used to a limited extent for grazing, but grasses and legumes are difficult to establish and to maintain. It is unsuited to cultivation because of the shallow root zone, droughtiness, and the steep slopes. (Capability unit VIIs–1; woodland group 9)

Colyer shaly silty clay loam, 6 to 30 percent slopes, severely eroded (CIE3).—This soil occurs on convex slopes on ridges and knobs. It is shallower to bedrock than the soil described as having the representative profile. As a result of erosion and plowing, the plow layer is in the shaly subsoil. Included in mapping were small areas of Rockcastle soils, of shale outcrop, and of moderately eroded soils.

The organic-matter content is low, and the available moisture capacity is low. The root zone is very shallow to shale bedrock.

This soil is limited to use for woodland and wildlife habitat. It is unsuited to cultivation because of the very shallow root zone, the high shale content, and droughtiness. (Capability unit VIIs–3; woodland group 8)

Corydon Series

The Corydon series consists of somewhat excessively drained soils that are shallow to moderately deep to bedrock. These soils developed in residuum weathered from limestone. They have a clayey subsoil.

In a representative profile that is moderately eroded, the plow layer is dark-brown silt loam about 5 inches thick. The subsoil is dark-brown and reddish-brown silty clay or clay. Limestone bedrock occurs at a depth of about 20 inches.

The available moisture capacity and the permeability are moderate. The reaction is near neutral.

Soils of the Corydon series occur throughout Nelson County, except in the northeastern and extreme southern parts. The largest acreages are in an area that extends from Bardstown southeast to Botland and northwest to the county line. Approximately 40 percent of the acreage is cleared and is either pastured or idle. The remaining acreage is wooded, mainly with oak, hickory, and yellow-poplar. Corydon soils are not commonly used for row crops.

Representative profile of Corydon very rocky silt loam, 6 to 20 percent slopes, eroded:

Ap—0 to 5 inches, dark-brown (7.5YR 3/2) very rocky silt loam; weak, fine, crumb structure; friable when moist; slightly acid; clear, smooth boundary.
B21t—5 to 12 inches, dark-brown (7.5YR 4/4) silty clay; weak, fine, subangular blocky structure; firm when moist, sticky when wet; common roots; common clay films; neutral; clear, smooth boundary.
B22t—12 to 18 inches, reddish-brown (5YR 4/4) silty clay or clay; moderate, medium, subangular blocky structure; very firm when moist, very sticky and plastic when wet; few roots; common clay films; common, small, round, soft, very dusky red concretions; mildly alkaline; gradual, smooth boundary.

C—18 to 20 inches, reddish-brown (5YR 4/4) silty clay; common, large, faint, dark-brown (7.5YR 4/4) variegations; massive; very firm when moist, sticky when wet; common fragments of yellowish-brown, porous, weathered limestone; mildly alkaline; abrupt, wavy boundary.
R—20 inches +, limestone.

The color of the Ap horizon is 7.5YR or 5YR in hue and 2 to 4 in chroma. In severely eroded places the texture of this horizon is silty clay. In unplowed places there is a 1- to 2-inch A1 horizon and a 4- to 5-inch A2 horizon, both of dark-brown silt loam.

The color of the B horizon ranges from 2.5YR to 7.5YR in hue, 3 to 5 in value, and 4 to 6 in chroma. The upper part of the B horizon in some profiles is silty clay loam. The C horizon is less than 10 inches thick in most places and is lacking from some profiles.

The solum ranges from about 14 to 26 inches in thickness. The depth to bedrock is about 14 to 36 inches. Soil-filled crevices and solution holes, several feet deep, are common in the bedrock. Rock outcrops cover about 3 to 25 percent of the surface. In some places the outcrops occur in small patches, and in other places they are fairly evenly distributed.

Corydon soils are associated with Pembroke, Hagerstown, Beasley, Trappist, Otway, and Colyer soils. Corydon soils have a thinner subsoil and a rockier surface layer than Hagerstown, Pembroke, and Beasley soils, and they are shallower to bedrock. Corydon soils have a more clayey subsoil than Pembroke soils. They lack the underlying marl that characterizes Beasley soils. Corydon soils differ from Trappist soils in being shallower to bedrock, in having more rock outcrops, in being less acid, and in lacking the shale component that characterizes Trappist soils. They lack the thick, dark-colored, nearly neutral surface layer, the grayish subsoil, and the marl substratum that characterize Otway soils. Corydon soils are redder, more clayey, less acid, and deeper to bedrock than Colyer soils. They have more rock outcrops than Colyer soils, and they lack a shale component.

Corydon silt loam, 2 to 6 percent slopes (CnB).—This soil is on narrow ridges and has convex slopes. It differs from the soil described as having the representative profile for the series in that the surface layer is slightly thicker, the rock outcrops are fewer, and the depth to bedrock is a few inches greater. Included in mapping were small areas of Hagerstown and Pembroke soils, of Corydon very rocky silt loam, and of moderately eroded soils.

The natural fertility is moderate. The organic-matter content is medium in the plow layer. The plow layer can be tilled throughout a fairly wide range of moisture content without clodding or crusting. The root zone is moderately deep.

This soil is suited to most of the common crops. It is not well suited to deep-rooted crops. If cultivated crops are grown, the erosion hazard is severe. Slight droughtiness limits the growth of all crops. (Capability unit IIIe–7; woodland group 2)

Corydon silt loam, 6 to 12 percent slopes, eroded (CnC2).—This soil occurs on narrow ridgetops and on the upper part of valley walls. It has convex slopes. It differs from the soil described as having the representative profile in having fewer rock outcrops. As a result of erosion and plowing, the plow layer is partly subsoil. Included in mapping were small areas of Pembroke and Hagerstown soils, of Corydon very rocky silt loam, and of severely eroded and uneroded soils.

The natural fertility is moderate. The organic-matter content is low. The plow layer is easy to till and can be tilled throughout a fairly wide range of moisture content without clodding or crusting. The root zone is moderately deep.

Although it can be used for most of the common crops, this soil should be cultivated only occasionally, because the erosion hazard is very severe. It is better suited to pasture and hay than to cultivated crops. It is not well suited to deep-rooted crops. Slight droughtiness limits the growth of all crops. (Capability unit IVe–3; woodland group 2)

Corydon silt loam, 12 to 20 percent slopes, eroded (CnD2).—This soil occurs on the upper part of valley walls. It has convex slopes. It differs from the soil described as having the representative profile in having fewer rock outcrops. As a result of erosion and plowing, the plow layer is partly subsoil. Included in mapping were small areas of Hagerstown soils, of Corydon very rocky silt loam, and of uneroded and severely eroded soils.

The natural fertility is moderate. The organic-matter content is low. The plow layer is easy to till and can be tilled throughout a fairly wide range of moisture content without clodding or crusting.

This soil is unsuited to cultivation because of the effects of erosion and the hazard of future erosion. It is better used for pasture, woodland, and wildlife habitat. Most grasses and legumes can be grown. (Capability unit VIe–1; woodland group 2)

Corydon silty clay, 6 to 20 percent slopes, severely eroded (CoD3).—This soil occurs on the upper part of valley walls. It has convex slopes. The plow layer is more clayey, rock outcrops are fewer, and the depth to bedrock is a few inches less than in the soil described as having the representative profile. As a result of erosion, the plow layer consists mostly of the clayey subsoil. Included in mapping were small areas of Hagerstown soils, of Corydon very rocky silty clay, and of moderately eroded soils.

The natural fertility is moderately low. The plow layer is difficult to till because the organic-matter content is very low and the texture is silty clay. It can be tilled only within a somewhat narrow range of moisture content without clodding or crusting. The root zone is shallow.

This soil is unsuited to cultivation because of the effects of erosion and the hazard of future erosion. It is better used for pasture, woodland, or wildlife habitat. Stands of grasses and legumes are difficult to establish and maintain. (Capability unit VIe–4; woodland group 8)

Corydon very rocky silt loam, 6 to 20 percent slopes, eroded (CrD2).—This soil occurs on convex slopes on the upper part of valley walls. It has the profile described as representative for the series. As a result of erosion and plowing, the plow layer is partly subsoil. Included in mapping were small areas of Hagerstown soils, of uneroded and severely eroded soils, and of rock outcrop.

The natural fertility is moderate. The plow layer is low in organic-matter content. Rock outcrops interfere with the operation of farm machinery.

This soil is unsuited to cultivation because of the rock outcrops, the strong slopes, and the hazard of further erosion. Better uses are pasture, woodland, and wildlife habitat. Most grasses and legumes can be grown. (Capability unit VIs–1; woodland group 7)

Corydon very rocky silty clay, 12 to 30 percent slopes, severely eroded (CsE3).—This soil occurs on valley walls and has convex slopes. It is redder and more clayey in the plow layer and is a few inches shallower to bedrock than the soil described as having the representative profile. As a result of erosion and plowing, the plow layer consists mostly of the clayey subsoil. Included in mapping were small areas of moderately eroded soils, of Rock land, and of steep cliffs.

The natural fertility is moderately low. The plow layer is difficult to till because of silty clay texture and low organic-matter content. Operating machinery over the rocks and steep slopes is difficult.

This soil is unsuited to cultivation because of the numerous rock outcrops, the slopes, and the effects of erosion. It can be used to a limited extent for grazing, but the hazard of further erosion is very severe unless cover is maintained. Better uses are woodland and wildlife habitat. (Capability unit VIIe–1; woodland group 8)

Crider Series

The Crider series consists of well-drained, deep soils. These soils developed in loess that was deposited over residuum weathered from limestone.

In a representative profile, the surface layer consists of dark grayish-brown silt loam about 1 inch thick and yellowish-brown silt loam about 8 inches thick. The upper 4 inches of the subsoil consists of strong-brown silt loam. Below this is yellowish-red silty clay loam that extends to a depth of about 60 inches and is mottled below a depth of about 26 inches.

The natural fertility of these soils is moderately high. Permeability is moderate, and the available moisture capacity is high. The plow layer is medium in organic-matter content, and it is easy to till. The reaction is medium acid to strongly acid. The root zone is deep.

Soils of the Crider series occur on ridgetops in the southern and western parts of Nelson County. Nearly all the acreage is woodland. Oak, hickory, and yellow-poplar are dominant. A small acreage is cleared and is used for pasture.

Representative profile of Crider silt loam, 6 to 12 percent slopes:

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

A2—1 to 9 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, granular structure; friable; abundant roots; strongly acid; clear, smooth boundary.

B1t—9 to 13 inches, strong-brown (7.5YR 5/6) heavy silt loam; weak, medium, subangular blocky structure; firm; common roots; few clay films; strongly acid; clear, wavy boundary.

B2t—13 to 26 inches, yellowish-red (5YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; firm, slightly sticky; continuous clay films; few fine chert fragments; few dark reddish-brown concretions; less than 35 percent clay; strongly acid; clear, wavy boundary.

B3t—26 to 60 inches +, yellowish-red (5YR 5/6 and 4/6) silty clay loam; common, medium, distinct, pale-brown (10YR 6/3) and few, medium, distinct, light-gray (10YR 7/2) variegations; moderate, medium, subangular blocky structure; very firm, slightly sticky; common clay films; approximately 10 percent small chert fragments; strongly acid.

In plowed places the Ap horizon is brown (10YR 4/3) silt loam. The A2 horizon is 6 to 8 inches thick. The B1 horizon is brown (7.5YR 4/4) in some profiles, and the texture ranges from silt loam to silty clay loam. In some profiles the chert content of the B3t horizon is as much as 35 percent.

The solum ranges from 50 to 65 inches in thickness. The depth to bedrock ranges from 5 to 8 feet.

Crider soils are associated with Bedford and Baxter soils. They have a redder subsoil than Bedford soils, and they lack the fragipan that is characteristic of Bedford soils. Crider soils have a less clayey subsoil and are less cherty than Baxter soils.

Crider silt loam, 6 to 12 percent slopes (CtC).—This soil occurs at the top of ridges. It has convex slopes. Included in mapping were small areas of moderately and severely eroded soils and of soils that have slopes of less than 6 percent.

This soil is suited to most of the common crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–1; woodland group 1)

Dunning Series

The Dunning series consists of very poorly drained soils that developed in recent alluvium washed from soils of limestone origin.

In a representative profile, the plow layer is very dark grayish-brown silty clay loam about 6 inches thick. The subsoil is mottled, very dark gray silty clay loam about 17 inches thick. Below this is dark grayish-brown, mottled silty clay, and at a depth of about 35 inches is olive-gray clay.

The natural fertility of these soils is high, and the organic-matter content is high. Permeability is slow, and the available moisture capacity is high. The plow layer is difficult to till, in spite of the high organic-matter content, because the texture is silty clay loam. The root zone is deep, but it is saturated periodically by a seasonal high water table.

Soils of the Dunning series occur on flood plains throughout Nelson County. Nearly all of the acreage has been cleared. Most of it is used for pasture and hay. A few areas have been artificially drained and are used for corn.

Representative profile of Dunning silty clay loam:

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) silty clay loam; moderate, medium, granular structure; friable when moist, slightly sticky when wet; common roots; moderately alkaline; clear, smooth boundary.

Bg—6 to 23 inches, very dark gray (10YR 3/1) heavy silty clay loam; few, fine, distinct, gray (5Y 5/1) mottles; weak, coarse, subangular blocky structure; very firm when moist, sticky when wet; few roots; moderately alkaline; gradual, smooth boundary.

C1g—23 to 35 inches, dark grayish-brown (2.5Y 4/2) silty clay; few, fine, distinct, olive (5Y 5/3) mottles; massive; firm when moist, sticky when wet; few, small, round, black concretions; moderately alkaline; gradual, smooth boundary.

C2g—35 to 50 inches +, olive-gray (5Y 4/2) clay; many, medium, distinct, light olive-brown (2.5Y 5/4) mottles; massive; very firm when moist, sticky when wet; moderately alkaline.

The color of the Ap horizon is 2 to 3 in value and 1 to 2 in chroma. The Bg horizon is silty clay loam to silty clay. The reaction throughout the profile is slightly acid to moderately alkaline.

Dunning soils are associated with Huntington, Lindside, Newark, and Melvin soils. They are darker colored, more dominantly gray, and more clayey than Huntington, Newark, and Lindside soils. They are darker colored and more clayey than Melvin soils.

Dunning silty clay loam (0 to 2 percent slopes) (Du).—This soil occurs in slight depressions on flood plains. It is frequently flooded and is saturated for long periods. It is suited to plants that tolerate excessive wetness. Tile drainage would widen the selection of crops and lengthen the period during which fieldwork can be conducted. (Capability unit IIIw–5; woodland group 4)

Eden Series

The Eden series consists of well-drained soils that have a clayey subsoil. These soils developed in residuum weathered from thin-bedded limestone, siltstone, and calcareous shale.

In a representative profile, the plow layer is dark grayish-brown silty clay loam about 4 inches thick. The subsoil is light olive-brown clay about 10 inches thick. The underlying material, to a depth of several feet, is mottled light olive-brown clay.

The natural fertility is moderate. The reaction is near neutral. Permeability is slow, and the available moisture capacity is moderate. Roots penetrate the clay subsoil to a moderate depth.

Soils of the Eden series occur in the eastern part of Nelson County. Approximately 95 percent of the acreage has been cleared, but about 15 percent has reverted to hardwood trees. Pasture is the dominant use, but a small acreage is used for row crops, alfalfa, and lespedeza. About 20 percent is idle.

Representative profile of Eden silty clay loam, 30 to 50 percent slopes, eroded:

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) silty clay loam; moderate, medium, granular structure; friable; many roots; medium acid; abrupt, smooth boundary.

Bt—4 to 14 inches, light olive-brown (2.5Y 5/4) clay; interiors of peds light olive brown (2.5Y 5/6); strong, coarse, angular blocky structure; very firm when moist, very plastic and very sticky when wet; common roots; continuous clay films; few worm casts; 2 percent small fragments of weathered siltstone and shale; neutral; clear, smooth boundary.

C—14 to 72 inches, light olive-brown (2.5Y 5/4) clay; common, medium, faint variegations of light olive brown (2.5Y 5/6) and few, fine, distinct variegations of olive (5Y 5/3); massive; very firm when moist, plastic and sticky when wet; few roots; 12 percent weathered fragments of dark-brown and light olive-brown shale; mildly alkaline.

R—72 inches +, interbedded limestone and calcareous shale.

The Ap horizon ranges from silt loam to clay in texture. The color of this horizon ranges from 10YR to 2.5Y in hue, from 4 to 5 in value, and from 2 to 4 in chroma.

The B horizon ranges from clay to silty clay and, rarely, to silty clay loam in texture. The color of this horizon ranges from 10YR to 5Y in hue, from 4 to 5 in value, and from 2 to 6 in chroma.

The C horizon is clay to silty clay. The color of this horizon ranges from 10YR to 2.5Y in hue, from 4 to 5 in value, and from 4 to 6 in chroma.

The solum is about 10 to 18 inches thick. The reaction generally is slightly acid to mildly alkaline but is strongly acid in the upper part of a few profiles. The content of shale, siltstone, and limestone fragments varies from place to place. Where the R horizon is predominately siltstone, the profile contains siltstone fragments and is more silty in texture than the profile described. Some profiles are 15 to 45 percent thin slabs of limestone (flagstones). In a few places bedrock is exposed. Thin layers of slightly weathered limestone commonly occur at a depth of 24 to 40 inches. The depth to unweathered bedrock is 6 to 10 feet or more.

Eden soils are associated with Lowell, Nicholson, and Fairmount soils. Eden soils have a lighter colored surface layer and are deeper to bedrock than Fairmount soils. They have a thinner, less acid B horizon and are more clayey throughout the profile than Lowell soils. Eden soils have a thinner and more clayey B horizon than Nicholson soils, and they lack the fragipan that is characteristic of Nicholson soils.

Eden silty clay loam, 30 to 50 percent slopes, eroded (EcF2).—This soil occurs on valley walls and has slightly convex slopes. It has the profile described as representative of the series. As a result of moderate erosion, the plow layer consists partly of subsoil. Included in mapping were small areas of uneroded Eden silt loam and of severely eroded Eden soils.

The plow layer is somewhat difficult to till because of the low organic-matter content and the silty clay loam texture.

This soil is very severely limited, mainly by the slopes and the erosion hazard. It is unsuited to cultivated crops and is of limited use for pasture. Woodland and wildlife habitat are better uses. Operating machinery is difficult because of the slopes. (Capability unit VIIe–1; woodland group 2)

Eden silty clay, 6 to 12 percent slopes, severely eroded (EeC3).—This soil occurs on slightly convex ridgetops and on the upper part of side slopes, above steeper Eden soils. It has a lighter colored, more clayey plow layer than the soil described as having the representative profile. Shallow gullies are common, and the plow layer is mostly subsoil. Included in mapping were small areas of moderately eroded Eden soils and of Eden soils that have slopes of more than 12 percent.

The plow layer is difficult to till because of the very low organic-matter content and the silty clay texture. It can be tilled only within a somewhat narrow range of moisture content without clodding or crusting.

This soil should be planted to close-growing crops most of the time because of the effects of erosion and the hazard of further erosion. It is better suited to pasture and hay than to cultivated crops. (Capability unit IVe–11; woodland group 8)

Eden silty clay, 12 to 30 percent slopes, severely eroded (EeE3).—This soil occurs on valley walls and has slightly convex slopes. It is lighter colored and more clayey in the plow layer than the soil described as having the representative profile. Shallow gullies are common, and the plow layer is mostly subsoil. Included in mapping were small areas of moderately eroded Eden soils and of Gullied land, calcareous shaly materials.

The plow layer is difficult to till because of the very low organic-matter content and the silty clay texture. It can be tilled only within a narrow range of moisture content without clodding or crusting.

This soil is severely limited, mainly by the slopes and the hazard of further erosion and the steepness. It can be used for pasture (fig. 10), woodland, and wildlife habitat. (Capability unit VIe–2; woodland group 8).

Figure 10.—Pasture on Eden silty clay, 12 to 30 percent slopes, severely eroded, on the sides of valleys. The corn on the ridgetops at the right is on Lowell silt loam, 2 to 6 percent slopes.

Eden flaggy clay, 20 to 30 percent slopes, severely eroded (EfE3).—This soil occurs on valley walls and has slightly concave slopes. The plow layer is lighter colored than that of the soil described as having the representative profile. Flagstones cover 15 to 45 percent of the surface and make up 15 to 45 percent of the profile. Shallow to moderately deep gullies are common. Included in mapping were small areas of moderately eroded Eden flaggy silty clay loam and of Gullied land, calcareous shaly materials.

The clay surface layer cracks when it dries out. Tillage is difficult because of the very low content of organic matter, the clay texture, and the flagstones. The hazard of further erosion is severe.

This soil is unsuited to cultivation but is suited to pasture, woodland, and wildlife habitat. (Capability unit VIe–2; woodland group 8)

Eden flaggy clay, 30 to 50 percent slopes, severely eroded (EfF3).—This soil occurs on valley walls and has slightly convex slopes. The plow layer is lighter colored and more clayey than that of the soil described as having the representative profile. Flagstones cover 15 to 45 percent of the surface and make up 15 to 45 percent of the profile. Shallow gullies are common, and the plow layer is mostly subsoil. Included in mapping were small areas of moderately eroded Eden flaggy silty clay loam and of Gullied land, calcareous shaly materials.

Tillage is difficult because of the very low organic-matter content, the clay texture, and the flagstones. Operating machinery is difficult because of the slopes. The hazard of further erosion is severe.

This soil can be used for woodland, for wildlife habitat, and, to a limited extent, for grazing. (Capability unit VIIe–1; woodland group 8)

Elk Series

The Elk series consists of well-drained, deep soils that developed in alluvium washed mainly from soils of limestone origin. These soils are on stream terraces.

In a representative profile, the plow layer is dark-brown silt loam about 8 inches thick. The subsoil, which extends to a depth of 54 inches or more, is brown silt loam in the upper 8 inches and dark-brown silty clay loam below.

The natural fertility of these soils is high, and the organic-matter content of the plow layer is medium. The plow layer is easy to till, and it can be tilled throughout

a fairly wide range in moisture content without clodding or crusting. The reaction is medium acid to strongly acid. Permeability is moderate, and the available moisture capacity is high. The root zone is deep.

Nearly all of the acreage is cleared. Most of the cleared acreage is used for row crops and hay. Some is used for pasture and some for woodland.

Soils of the Elk series occur on stream terraces throughout Nelson County.

Representative profile of Elk silt loam, 6 to 12 percent slopes:

Ap—0 to 8 inches, dark-brown (7.5YR 4/2) silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary.

B1—8 to 16 inches, brown (7.5YR 5/4) silt loam; weak, medium and fine, subangular blocky structure; firm; few, small, round, soft, dark reddish-brown concretions; strongly acid; gradual, smooth boundary.

B21t—16 to 31 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; firm; many roots; thin, almost continuous clay films on most ped faces; few, small, round, soft, dark reddish-brown concretions; medium acid; gradual, smooth boundary.

B22t—31 to 41 inches, dark-brown (7.5YR 4/4) light silty clay loam; common, medium, distinct variegations of light yellowish brown (10YR 6/4); weak to moderate, medium, subangular blocky structure; firm; common roots; thin, continuous clay films on most ped faces; common, small, round, soft, dark reddish-brown concretions; few small pebbles; medium acid; gradual, smooth boundary.

B3—41 to 54 inches +, dark-brown (7.5YR 4/4) heavy silty clay loam; common variegations of pale brown (10YR 6/3); weak, medium, subangular blocky structure; firm, slightly sticky and plastic; common, soft, round, dark reddish-brown concretions; few pebbles; medium acid.

The color of the Ap horizon ranges from 10YR to 7.5YR in hue, from 3 to 4 in value, and from 2 to 3 in chroma. The color of the B horizon ranges from 10YR to 7.5YR in hue, from 4 to 5 in value, and from 4 to 6 in chroma. The B3 horizon in a few profiles consists of stratified silt and clay.

The solum is about 45 to 60 inches thick. The depth to bedrock is about 4 to 9 feet. Some profiles contain a few pebbles throughout, and in others the C horizon contains as much as 10 percent pebbles. The reaction is medium to strongly acid throughout the profile.

Elk soils are associated with Bedford, Lawrence, Woolper, and Huntington soils. Elk soils are more brown, less yellow, and less mottled than Bedford and Lawrence soils, and they lack the fragipan that is characteristic of these soils. Elk soils are lighter colored and less clayey throughout the profile than Woolper soils. They are more clayey throughout the profile than Huntington soils, which lack horizons of clay accumulation.

Elk silt loam, 0 to 2 percent slopes (EkA).—This soil is on stream terraces. It has straight slopes. Included in mapping were small areas of soils similar to Elk soils except that the lower part of the subsoil is slightly compact and contains a few mottles.

This soil is suited to all the common crops. It is flooded infrequently. (Capability unit I–3; woodland group 1)

Elk silt loam, 2 to 6 percent slopes (EkB).—This soil is on stream terraces. It has straight slopes. Included in mapping were small areas of moderately eroded soils.

This soil is suited to all the common crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–1; woodland group 1)

Elk silt loam, 6 to 12 percent slopes (EkC).—This soil is on stream terraces. It has the profile described as representative for the series. The slopes are slightly concave. Included in mapping were a few small areas of moderately eroded and severely eroded Elk soils.

This soil is suited to all the common crops. When cultivated crops are grown, the hazard of erosion is severe. (Capability unit IIIe–1; woodland group 1)

Fairmount Series

The Fairmount series consists of somewhat excessively drained soils that are shallow to bedrock. These soils have clayey subsoils. They developed in residuum weathered from thin-bedded limestone and shale.

In a representative profile, the plow layer is very dark grayish-brown silty clay loam about 7 inches thick. The subsoil, about 6 inches thick, is dark yellowish-brown to light olive-brown clay. Below this is a 5-inch layer of olive-brown clay. At a depth of about 18 inches is bedrock.

Permeability is moderately slow, and the reaction is neutral to moderately alkaline.

Soils of the Fairmount series occur in the northern half of Nelson County. Approximately 80 percent of the acreage has been cleared. Most of this is pasture that consists mainly of Kentucky bluegrass and white clover. A fairly large acreage is idle. The woodland consists mainly of locust, elm, redcedar, oak, hickory, and hackberry. Osage-orange is common in hedgerows. Fairmount soils are rarely used for row crops.

Representative profile of Fairmount flaggy silty clay loam, 12 to 30 percent slopes:

Ap—0 to 7 inches, very dark grayish-brown (10YR 3/2) silty clay loam; grayish-brown (10YR 5/2) when dry; dark yellowish-brown (10YR 4/4) when rubbed; moderate, medium, crumb microstructure and weak, medium, subangular blocky macrostructure; firm; many roots; 17 percent limestone fragments on surface and in horizon; neutral; clear, smooth boundary.

B—7 to 13 inches, dark yellowish-brown (10YR 4/4) to light olive-brown (2.5Y 5/4) clay; strong, medium and coarse, angular blocky structure; very firm, very plastic, very sticky; many roots; thin patchy clay films; many ped faces stained dark grayish brown (10YR 4/2); 3 percent limestone fragments; common worm casts; neutral; clear, wavy boundary.

C—13 to 18 inches, olive-brown (2.5Y 4/4) clay; weak, medium, angular blocky structure; very firm, very sticky, very plastic; few roots; 25 percent fragments of gray, fossiliferous limestone; calcareous; clear, wavy boundary.

R—18 inches +, gray, fossiliferous, thin-bedded limestone of the Maysville Formation.

The Ap horizon in severely eroded places is clayey in texture. The color of this horizon ranges from 2 to 3 in value and from 1 to 3 in chroma. In unplowed places there is a very dark gray (10YR 3/1) A1 horizon.

The color of the B horizon ranges from 10YR to 2.5Y in hue, from 4 to 5 in value, and from 3 to 6 in chroma. Many profiles lack a C horizon.

The solum generally is about 8 to 16 inches thick. The depth to bedrock ranges from about 8 to 24 inches, but it is most commonly about 15 inches. Limestone fragments 3 to 8 inches wide (flagstones) make up from 8 to 30 percent of most profiles, and limestone ledges outcrop in many places.

Fairmount soils are associated with Lowell, Faywood, Otway, and Eden soils. Fairmount soils have a darker colored surface layer, a thinner and more clayey subsoil, and more ledges than Lowell and Faywood soils and are less deep to bedrock. They have a thinner surface layer

and a less gray and less mottled subsoil than Otway soils and are less deep to hard bedrock. Fairmount soils have a darker colored surface layer than Eden soils and are shallower to bedrock.

Fairmount silty clay loam, 6 to 20 percent slopes (FcD).—This soil occurs on ridgetops and on the upper part of valley walls. It contains fewer limestone slabs and limestone outcrops than the soil described as having the profile representative for the series. The slopes are convex. Included in mapping were a few areas of severely eroded Fairmount soils, which have a lighter colored plow layer than the uneroded soils.

The natural fertility of this soil is moderate, and the organic-matter content is high. The plow layer is somewhat difficult to till, in spite of the high organic-matter content, because the texture is silty clay loam. The available moisture capacity is moderate. The root zone is shallow.

This soil is severely limited, mainly by the erosion hazard. It is suited to pasture, woodland, and wildlife habitat. (Capability unit VIe–1; woodland group 7)

Fairmount flaggy silty clay loam, 12 to 30 percent slopes (FfE).—This soil occurs on valley walls and has slightly convex slopes. It has the profile described as representative for the series. Included in mapping were small areas of Rock land and of severely eroded soils.

The natural fertility of this soil is low to moderate, and the organic-matter content is high. The plow layer is difficult to till, in spite of the high organic-matter content, because of the silty clay loam texture and the flagstones. The available moisture capacity is low to moderate. The root zone is shallow.

This soil is severely limited, mainly by the erosion hazard. It is suited to pasture, woodland, and wildlife habitat. (Capability unit VIe–1; woodland group 7)

Fairmount flaggy clay, 6 to 20 percent slopes, severely eroded (FmD3).—This soil occurs on ridgetops and on the upper part of valley walls. It has a more clayey plow layer and is shallower to bedrock than the soil described as having the representative profile. Included in mapping were small areas of soils that have a strong-brown clayey subsoil and contain rounded calcareous fossils that have a honeycomblike surface; of uneroded soils; of Rock land; and of soils which have a lighter colored plow layer.

The natural fertility is low, and the organic-matter content is low. The available moisture capacity is very low. The plow layer is very difficult to till because of the low organic-matter content, the flagstones, and the clayey texture. The root zone is shallow.

This soil is severely limited by the effects of past erosion and the hazard of further erosion. It is suited to pasture, woodland, and wildlife habitat. (Capability unit VIe–4; woodland group 8)

Fairmount flaggy clay, 20 to 50 percent slopes, severely eroded (FmF3).—This soil occurs on valley walls and has slightly convex slopes. It differs from the soil described as having the representative profile in having a more clayey plow layer, less depth to bedrock, and more limestone ledges. As a result of erosion, the plow layer consists of the clay subsoil. Included in mapping were small areas of Fairmount flaggy silty clay loam, of soils which have a lighter colored surface layer, and of Rock land.

The natural fertility is low, and the organic-matter content is low. The available moisture capacity is very low. The plow layer is very difficult to till because of the low organic-matter content, the flagstones, and the clayey texture. The root zone is shallow.

This soil is very severely limited because of the effects of erosion, the hazard of further erosion, and the slopes. It can be used for woodland, for wildlife habitat, and, to a limited extent, for grazing. The operation of machinery is difficult. (Capability unit VIIe–1; woodland group 8)

Faywood Series

The Faywood series consists of well-drained soils that have a clayey subsoil and are moderately deep to bedrock. These soils developed in residuum weathered from thin-bedded limestone and shale.

In a representative profile that is moderately eroded, the plow layer is brown silty clay loam about 5 inches thick. The subsoil is yellowish-brown silty clay about 21 inches thick. Below this is dark yellowish-brown, mottled silty clay. Bedrock occurs at a depth of about 32 inches.

Permeability is moderately slow. The root zone is moderately deep. Soils of the Faywood series are on the uplands in the northern and northeastern parts of Nelson County. They are used chiefly for pasture. Only a small acreage is in row crops. About 20 percent is wooded. Oak, hickory, locust, and redcedar are dominant. Osage-orange is very common in hedgerows.

Representative profile of Faywood silty clay loam, 12 to 20 percent slopes, eroded:

Ap—0 to 5 inches, brown (10YR 4/3) silty clay loam; weak, fine, granular structure; friable when moist; few small rock fragments; common roots; few, small, round, soft, very dark brown (10YR 2/2) concretions; medium acid; clear, smooth boundary.

B2t—5 to 18 inches, yellowish-brown (10YR 5/4) silty clay; moderate, medium, angular blocky structure; very firm when moist, sticky when wet; common clay films; few very dark brown (10YR 2/2), small, round, soft concretions; few small rock fragments; few intrusions of brown (10YR 4/3) in upper part; strongly acid; gradual, wavy boundary.

B3t—18 to 26 inches, yellowish-brown (10YR 5/6) silty clay; common, medium, distinct, pale-brown (10YR 6/3) and light olive-brown (2.5Y 5/4) mottles; moderate, medium, angular blocky structure; very firm when moist, sticky when wet; common clay films; common, very dark brown (10YR 2/2), small, round, soft concretions; strongly acid; clear, wavy boundary.

C—26 to 32 inches, dark yellowish-brown (10YR 4/4) silty clay; abundant yellowish-brown (10YR 5/4) and light olive-brown (2.5Y 5/4) mottles; massive; very firm when moist, plastic when wet; abundant, very dark brown (10YR 2/2) concretions and concretionary streaks; slightly gritty; medium acid; clear, wavy boundary.

R—32 inches, limestone bedrock of the Richmond Formation.

The Ap horizon in severely eroded places is silty clay. The color of this horizon ranges from 4 to 5 in value and 2 to 4 in chroma.

The color of the B horizon ranges from 10YR to 7.5YR in hue, 4 to 5 in value, and 4 to 6 in chroma. The B horizon in some profiles is clay. Some profiles lack a C horizon, and others have a C horizon that is pale olive (5Y 6/4).

The solum generally is about 20 to 30 inches thick. The depth to bedrock ranges from about 22 to 36 inches. Most areas have a few limestone outcrops, but these make up less than 2 percent of the acreage. The reaction ranges from

strongly acid to slightly acid, but in some profiles it is neutral to alkaline near bedrock.

Faywood soils are associated with Beasley, Lowell, and Fairmount soils. Faywood soils have a more yellow and less red subsoil and are shallower to hard rock than Beasley soils, which overlie calcareous shale. Faywood soils have a thinner subsoil than Lowell soils, and they are shallower to bedrock. They have a lighter colored surface layer and a thicker subsoil than Fairmount soils, and they are deeper to bedrock and less rocky and less flaggy.

Faywood silty clay loam, 6 to 12 percent slopes, eroded (FwC2).—This soil is on the upper part of valley walls and on ridgetops. As a result of erosion, the plow layer is partly subsoil. Included in mapping were small areas of Fairmount and Lowell soils, of Faywood soils that have slopes of less than 6 percent, and of uneroded Faywood soils.

The natural fertility is moderate, and the organic-matter content is low. The available moisture capacity is moderate. The plow layer is somewhat difficult to till because of the low organic-matter content and the silty clay loam texture. It can be tilled only within a somewhat narrow range of moisture content without clodding or crusting.

This soil is suited to only occasional cultivation because the erosion hazard is very severe. Hay and pasture are better uses. Most grasses and legumes can be grown. (Capability unit IVe–3; woodland group 2)

Faywood silty clay loam, 12 to 20 percent slopes, eroded (FwD2).—This soil is on the upper part of valley walls. It has slightly convex slopes. As a result of erosion, the plow layer is partly subsoil. Included in mapping were small areas of Fairmount soils and of uneroded Faywood soils.

The natural fertility of this soil is moderate, and the organic-matter content is low. The available moisture capacity is moderate. The plow layer is difficult to till because of the low organic-matter content and the silty clay loam texture. It can be tilled only within a somewhat narrow range of moisture content without clodding or crusting.

This soil is unsuited for row crops because of the slopes and the hazard of further erosion. Pasture, woodland, and wildlife habitat are better uses. Most grasses and legumes can be grown. (Capability unit VIe–1; woodland group 2)

Faywood silty clay, 6 to 20 percent slopes, severely eroded (FyD3).—This soil is on the upper part of valley walls and on ridgetops. It has convex slopes. As a result of erosion, the plow layer is mostly subsoil. Included in mapping were small areas of Fairmount soils, of moderately eroded Faywood soils, and of Gullied land, acid shaly materials.

The natural fertility of this soil is moderate, and the organic-matter content is very low. The available moisture capacity is moderate. The plow layer is difficult to till because of the low organic-matter content and the silty clay texture. It can be tilled only within a narrow range of moisture content without clodding or crusting.

This soil is unsuited to row crops, mainly because of the effects of erosion and the hazard of further erosion. It is better used for pasture, woodland, and wildlife habitat. Most grasses and legumes can be grown, but stands of plants are difficult to establish and maintain. (Capability unit VIe–4; woodland group 3)

Gullied Land

Gullied land is so dissected by deep gullies or has undergone such severe sheet erosion that the soil profile has been largely destroyed except in narrow strips between gullies. In some places, sheet erosion has exposed the parent material and bedrock and gullies are less noticeable.

Gullied land, acid shaly materials (Ga).—Nearly all of this land type is made up of material of silty clay loam to clay texture. In most places, all of the original surface layer has been removed by erosion and an intricate pattern of gullies has formed. The depth to bedrock ranges from 1 foot to 6 feet. The slope range is 7 to 25 percent. Most areas are between 1 acre and 8 acres in size.

About 70 percent of this land type is associated with soils underlain by acid shale. Many areas are associated with Trappist, Colyer, and Tilsit soils and are underlain by black shale; other areas are underlain by gray shale, and a few by colluvium derived mainly from shale but partly from cherty limestone and sandstone. The rest of the acreage is associated with Lowell, Shelbyville, Pembroke, Hagerstown, Faywood, and Corydon soils and is underlain by limestone. The depth to limestone is generally greater than the depth to shale, and the material that overlies limestone is less acid than that over shale.

This land type is not suited to cultivated crops, and most of it is not suited to pasture. Better uses are woodland and wildlife habitat. (Capability unit VIIe–4; woodland group 11)

Gullied land, calcareous shaly materials (Gc).—This land type occurs mostly as narrow strips below areas of Corydon and Pembroke soils but is associated with Eden and Markland soils in some places. It consists of areas of Otway, Beasley, Markland, and Eden soils that are so severely eroded that most of the original profile has been destroyed and an intricate pattern of gullies of various depths has formed. The soil material is clayey and is very sticky and plastic when wet. It is mildly alkaline and in places calcareous. The depth to hard rock or soft shale is commonly less than 2½ feet, but between gullies it is as much as 4 feet. The slope range is 8 to 33 percent. Most areas are between 1 acre and 15 acres in size.

The natural fertility of this land type is low, the organic-matter content is very low, and the available moisture capacity is low. The topography is too rough to allow the use of farm machinery.

This land type is unsuited to cultivated crops, and most of it is unsuited to pasture. Better uses are woodland and wildlife habitat. (Capability unit VIIe–4; woodland group 11)

Hagerstown Series

The Hagerstown series consists of deep, well-drained soils that have a clayey layer in the subsoil. These soils developed in residuum weathered from limestone.

In a representative profile, the plow layer is brown silt loam about 7 inches thick. The subsoil, about 42 inches

thick, is reddish-brown to yellowish-red silty clay and silty clay loam. Below this is yellowish-red silty clay.

Permeability is moderate, and the available moisture capacity is high. The reaction is generally strongly acid throughout the profile, but it is medium acid in the upper part of some profiles. The root zone is deep.

Soils of the Hagerstown series occur in an area that is southeast and west of Bardstown. Nearly all of the acreage is cleared and used for crops. The rest is wooded, mainly with oak, hickory, cherry, and yellow-popular.

Representative profile of Hagerstown silt loam, 2 to 6 percent slopes:

Ap—0 to 7 inches, brown (7.5YR 4/4) silt loam; weak, fine, crumb structure; very friable when moist; common roots; medium acid; clear, smooth boundary.

B1t—7 to 12 inches, reddish-brown (5YR 4/4) to yellowish-red (5YR 4/6) silty clay loam; weak, medium, subangular blocky structure; firm when moist, slightly sticky when wet; common roots; few clay films on peds; few worm casts; few, small, round, soft, very dusky red (10R 2/2) concretions; strongly acid; clear, smooth boundary.

B21t—12 to 28 inches, reddish-brown (2.5YR 4/4) silty clay; moderate, medium, subangular blocky structure; very firm when moist, sticky when wet; few roots; common clay films on peds; few, small, round, soft, very dusky red (10R 2/2) concretions; strongly acid; gradual, smooth boundary.

B22t—28 to 38 inches, reddish-brown (5YR 4/4) to yellowish-red (5YR 4/6) silty clay; moderate, medium, subangular blocky structure; very firm when moist, sticky when wet; few roots; common clay films on peds; few chert fragments; few, round, soft, very dusky red (10R 2/2) concretions; few concretionary stains on peds; strongly acid; gradual, smooth boundary.

B3—38 to 49 inches, reddish-brown (5YR 4/4) to yellowish-red (5YR 4/6) silty clay; few, fine, distinct, strong-brown (7.5YR 5/6) variegations; weak, medium and fine, subangular blocky structure; very firm when moist, sticky when wet; few thin clay films; common, small, round, soft, very dusky red (10R 2/2) concretions and common concretionary stains; few chert fragments; strongly acid; gradual, smooth boundary.

C—49 to 68 inches +, yellowish-red (5YR 4/6) silty clay; many, medium, distinct, strong-brown (7.5YR 5/6) variegations; weak, fine, angular blocky structure to massive; very firm when moist, sticky when wet; common concretionary material; few chert fragments; strongly acid.

The color of the Ap horizon ranges from 7.5YR to 5YR in hue. In severely eroded places, the hue is redder and the texture is silty clay loam.

The color of the B horizon ranges from 5YR to 2.5YR in hue and from 4 to 6 in chroma. The C horizon ranges from 4 to 5 in value and from 6 to 8 in chroma.

The solum is about 38 to 55 inches thick. The depth to bedrock is about 5 to 8 feet. In some places the profile is about 1 to 5 percent chert fragments as much as 5 inches across.

Hagerstown soils are associated with Pembroke, Beasley, and Corydon soils. Hagerstown soils have a more clayey B horizon than Pembroke soils. They have a thicker, redder, and less plastic B horizon than Beasley soils, which overlie calcareous shale. Hagerstown soils have a thicker B horizon and a greater depth to bedrock than Corydon soils.

Hagerstown silt loam, 2 to 6 percent slopes (HaB).—This soil occurs on narrow to moderately broad ridgetops. It has the profile described as representative for the series. Included in mapping were small areas of Corydon and Pembroke soils and of moderately eroded soils.

The natural fertility of this soil is high, and the organic-matter content is medium. The plow layer is easy to till, and it can be tilled throughout a wide range in moisture content without clodding or crusting.

This soil is suited to all the common crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–1; woodland group 1)

Hagerstown silt loam, 6 to 12 percent slopes (HaC).—This soil occurs as narrow bands on and near ridgetops. It has convex slopes. Included in mapping were small areas of Corydon and Pembroke soils and of moderately eroded Hagerstown soils.

The natural fertility of this soil is high, and the organic-matter content is medium. The plow layer is easy to till, and it can be tilled throughout a wide range of moisture content without clodding or crusting.

This soil is suited to all the common crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–1; woodland group 1)

Hagerstown silty clay loam, 6 to 20 percent slopes, severely eroded (HgD3).—This soil occurs on and near ridgetops. It has convex slopes. It has a redder, more clayey plow layer than the soil described as having the representative profile. As a result of erosion, the plow layer is mostly clayey subsoil. Shallow gullies are common. Included in mapping were small areas of Corydon soils and of moderately eroded Hagerstown soils.

The natural fertility is moderate, and the organic-matter content is very low. The plow layer is somewhat difficult to till because of the silty clay loam texture. It can be tilled only within a somewhat narrow range in moisture content without clodding or crusting.

This soil is unsuited to cultivation because of the effects of erosion and the hazard of further erosion. Suitable uses are pasture, woodland, and wildlife habitat. Most grasses and legumes can be grown, but stands are often difficult to establish and maintain. (Capability unit VIe–2; woodland group 3)

Huntington Series

The Huntington series consists of deep, well-drained soils that developed in recent alluvium washed mainly from soils of limestone and shale origin. These soils are on flood plains and in sinks and depressions on uplands.

In a representative profile, the surface layer is dark-brown silt loam about 18 inches thick. The subsoil, to a depth of 45 inches or more, is brown silt loam.

The organic-matter content is medium. These soils can be tilled throughout a fairly wide range in moisture content without clodding or crusting. The root zone is deep. Most areas are flooded annually but seldom during the growing season.

Soils of the Huntington series occur throughout the county. Most of the acreage is cleared and used for row crops, hay, and pasture. The rest is wooded, mainly with gum, maple, elm, sycamore, and hickory.

Representative profile of Huntington silt loam, 0 to 4 percent slopes:

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

A1—9 to 18 inches, dark-brown (10YR 3/3) heavy silt loam; weak, medium, subangular blocky structure; friable; slightly acid; gradual, smooth boundary.

B—18 to 45 inches +, brown (10YR 4/3) heavy silt loam; weak, fine, subangular blocky structure; friable; medium acid.

The color of the Ap horizon ranges from 10YR to 7.5YR in hue and from 2 to 3 in chroma. That of the A1 horizon ranges from 3 to 4 in value and from 2 to 4 in chroma.

The color of the B horizon ranges from 4 to 5 in value and from 2 to 4 in chroma. A few brownish-gray and light olive-brown mottles occur in the lower part of some profiles. Other textures of the B horizon are light silty clay loam and loam.

The depth to bedrock ranges from 4 to 10 feet. The reaction is medium acid to mildly alkaline.

Huntington soils are associated with Lindside, Newark, Melvin, Dunning, Woolper, Bedford, Trimble, and Whitley soils. Huntington soils are better drained and less mottled than Lindside, Newark, and Melvin soils. They are lighter colored and less clayey than Dunning and Woolper soils. Huntington soils are better drained than Dunning soils, and they lack gray mottles. They are less acid and better drained than Bedford soils. Huntington soils lack the horizon of clay accumulation and the fragipan that characterize Bedford soils. They are less acid than Trimble and Whitley soils and lack the horizon of clay accumulation that is characteristic of those soils.

Huntington silt loam, 0 to 4 percent slopes (HuA).—This soil is on flood plains and in sinks and depressions on uplands. It has the profile described as representative for the series. Included in mapping were small acreages of Lindside and Newark soils; small areas of Huntington silt loam, gravelly variant; small areas of a soil that has a lighter colored surface layer; and a few areas of a soil that is mottled with olive gray in the lower part of a silty clay subsoil.

The natural fertility of this soil is high. Permeability is moderate, and the available moisture capacity is high. The plow layer is easy to till.

This soil is well suited to all the common crops. Nearly all of the acreage is used for corn, hay, and pasture. (Capability unit I-1; woodland group 6)

Huntington silt loam, 4 to 12 percent slopes (HuC).—This soil occurs on and near streambanks. Included in mapping were small areas of soils that have a subsoil of brown to yellowish-brown, blocky silty clay loam, of soils that have a lighter colored surface layer, and of deep soils on streambanks.

The natural fertility is high. Permeability is moderate, and the available moisture capacity is high. The plow layer is easy to till.

This soil is suited to all the common crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe-1; woodland group 6)

Huntington silt loam, gravelly variant (0 to 4 percent slopes) (Hv).—The profile of this soil differs from that described as representative for the series mainly in that the profile is 15 to 40 percent gravel and the surface layer is grayer and lighter colored. In many places stratified silt and gravel occurs at a depth of about 18 to 28 inches.

The natural fertility is moderate. Permeability is moderately rapid, and the available moisture capacity is moderate. The gravel in the plow layer hinders tillage somewhat.

Included in mapping were small acreages of Newark soils and of Huntington silt loam, a few areas in which the depth to bedrock is 20 to 30 inches, a few areas of a soil that is more than 50 percent stones, and a few areas of a strongly acid soil.

This soil is suited to most of the common crops. (Capability unit IIs-1; woodland group 6)

Lawrence Series

The Lawrence series consists of somewhat poorly drained soils that contain a fragipan. These soils are on stream terraces and uplands. Those on terraces developed in old alluvium derived mainly from soils of limestone origin, and those on uplands in loess deposited over residuum weathered from limestone and shale.

In a representative profile, the plow layer is grayish-brown silt loam about 7 inches thick. The subsoil is about 42 inches thick. The uppermost part is light yellowish-brown to brownish-yellow, mottled silt loam. The lower part is a mottled silty clay loam fragipan. Below this, at a depth of about 49 inches, is mottled, brownish-yellow silt loam.

The natural fertility of these soils is moderate, the organic-matter content is low, and the reaction is very strongly acid. Permeability is slow, and the available moisture capacity is moderate. The plow layer is easy to till, in spite of the low organic-matter content. The root zone is moderately deep.

Soils of the Lawrence series occur on stream terraces and uplands in all parts of the county except the extreme northeastern part. Most of the acreage is cleared and used for pasture and hay. A small acreage is wooded, mainly with gum, oak, maple, and yellow-poplar.

Representative profile of Lawrence silt loam:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary.

B1—7 to 11 inches, light yellowish-brown (2.5Y 6/4) silt loam; common, medium, faint, very pale-brown (10YR 7/3) and few, fine, faint, brownish-yellow (10YR 6/6) mottles; weak, fine, subangular blocky structure; friable; very strongly acid; gradual, smooth boundary.

B2tg—11 to 18 inches, brownish-yellow (10YR 6/6) silt loam; common, medium, distinct, light-gray (2.5Y 7/2 and 5Y 7/2) mottles; weak, medium, subangular blocky structure; firm; very strongly acid; gradual, smooth boundary.

Bx1—18 to 24 inches, mottled light yellowish-brown (2.5Y 6/4), brownish-yellow (10YR 6/6), and light olive-gray (5Y 6/2) light silty clay loam; weak, medium, subangular blocky structure; very firm and compact; few clay films; very strongly acid; gradual, smooth boundary.

Bx2—24 to 49 inches, light olive-brown (2.5Y 5/4) light silty clay loam; common, distinct, light-gray (2.5Y 7/2), gray (5Y 5/1), and brownish-yellow (10YR 6/6) mottles; weak, medium and coarse, angular blocky structure; very firm and compact; few clay films; very strongly acid; gradual, smooth boundary.

Cg—49 to 60 inches +, brownish-yellow (10YR 6/6) silt loam; olive-brown (2.5Y 5/4) mottles and gray (5Y 5/1 and 5Y 6/1) streaks; massive; firm; dark reddish-brown (5YR 3/2) concretionary stains; mildly alkaline.

The color of the Ap horizon ranges from 10YR to 2.5Y in hue, from 4 to 5 in value, and from 2 to 3 in chroma. That of the B1 horizon is 10YR to 2.5Y in hue, 5 to 6 in value, and 3 to 6 in chroma. That of the B2tg horizon is 10YR to 2.5Y in hue, 5 to 7 in value, and 2 to 6 in chroma. The Bx horizon can be dominantly light gray or yellowish brown. The Cg horizon in some places is dominantly gray (10YR 6/1). In texture the Cg horizon is silty clay in some places.

The solum generally is about 38 to 50 inches thick. The depth to the fragipan is about 15 to 23 inches. In some profiles the fragipan is thinner and less distinct than in the profile described. The depth to bedrock is about 5 to 10 feet.

The reaction is very strongly acid in the upper part of the profile, but it is strongly acid to mildly alkaline below a depth of 50 inches.

Lawrence soils are associated with Bedford, Tilsit, and Robertsville soils. They are less well drained and are mottled nearer the surface than Bedford and Tilsit soils. Lawrence soils are less mottled and less gray throughout the profile than Robertsville soils, and they are better drained.

Lawrence silt loam (0 to 4 percent slopes) (lc).—This soil is on uplands and stream terraces. It is saturated to within about a foot of the surface during periods of heaviest rainfall, and it is slow to dry out and warm up because of the slowly permeable fragipan. Some areas on stream terraces are flooded infrequently. Included in mapping was a small acreage of somewhat poorly drained soils that occur mainly on uplands. In these included soils the lower part of the B horizon and the C horizon are silty clay and the fragipan is lacking.

This soil is suited to shallow-rooted crops that tolerate moderate wetness. It is unsuited to tobacco and alfalfa, because of the limited depth of the root zone and the seasonal high water table.

Drainage through open ditches lengthens the time during which field operations are possible and widens the selection of plants. The fragipan hinders tile drainage. (Capability unit IIIw-1; woodland group 4)

Lindside Series

The Lindside series consists of deep, moderately well drained soils on flood plains. These soils developed in recent alluvium washed mainly from soils of limestone origin.

In a representative profile, the plow layer is dark grayish-brown silt loam about 7 inches thick. The subsoil, about 17 inches thick, is brown silt loam in the upper part and mottled, dark grayish-brown silt loam in the lower part. Below a depth of 24 inches is grayish-brown silty clay loam that is mottled with yellowish brown and light brownish gray.

The natural fertility is high, the organic-matter content is medium, and the reaction is near neutral. Permeability is moderate, and the available moisture capacity is high. The plow layer is easy to till, and it can be tilled throughout a fairly wide range of moisture content without clodding and crusting. The root zone is deep, but it becomes waterlogged at a depth of about 2 feet after heavy rain. Floods occur annually but seldom during the growing season.

Nearly level soils of the Lindside series are on low flood plains throughout Nelson County. Nearly all the acreage is cleared and used for corn, hay, and pasture.

Representative profile of Lindside silt loam:

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

B21—7 to 18 inches, brown (10YR 4/3) silt loam; weak, fine, granular to weak, fine, subangular blocky structure; friable; common, medium, faint, brown (10YR 5/3) mottles; neutral; gradual, smooth boundary.

B22—18 to 24 inches, dark grayish-brown (10YR 4/2) silt loam; about 35 percent mottles of pale brown (10YR 5/3) and few fine, faint mottles of light brownish gray 2.5Y 6/2); weak, coarse, subangular blocky structure; firm; few roots; neutral; gradual, smooth boundary.

C—24 to 46 inches +, grayish-brown (2.5Y 5/2) light silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) and few, fine, distinct, light brownish-gray (2.5Y 6/2) mottles; structureless (massive) to weak, medium, subangular blocky structure; firm, slightly sticky; small, soft, dark-brown concretions common to abundant; neutral.

The color of the Ap horizon ranges from 2 to 3 in chroma. That of the B21 horizon ranges from 4 to 5 in value and from 2 to 3 in chroma. In some places this horizon has a few light-gray mottles. The color of the B22 horizon ranges from 4 to 5 in value and from 2 to 3 in chroma. The color of the C horizon ranges from 2.5Y to 5Y in hue. In texture it is silt loam in some profiles.

The depth to bedrock ranges from 4 to 12 feet. As much as 8 percent of some profiles consists of small pebbles. The reaction is slightly acid to mildly alkaline.

Lindside soils are associated with Huntington, Newark, and Melvin soils. They are more gray and less brown than Huntington soils and are more mottled in the subsoil. Lindside soils are better drained than Newark and Melvin soils, and they are more brown and have fewer gray mottles in the upper 18 inches of the profile.

Lindside silt loam (0 to 2 percent slopes) (ld).—This soil occurs on low flood plains. Included in mapping were small acreages of Huntington and Newark soils and a few areas, mostly in narrow valleys, of a soil that has a silty clay loam plow layer and subsoil.

This soil is suited to most of the common crops. The seasonal high water table is a moderate limitation for growing alfalfa. The annual flooding is only a slight limitation because it seldom occurs during the growing season. Tile drainage is unnecessary for most crops, but it lengthens the time during which field operations are possible. (Capability unit I-1; woodland group 6)

Lowell Series

The Lowell series consists of deep, well-drained soils that have a clayey subsoil. These soils developed mainly in residuum weathered from thin-bedded limestone and shale but in places in residuum weathered from siltstone.

In a representative profile, the plow layer is brown silt loam about 8 inches thick. The subsoil, about 30 inches thick, is strong-brown silty clay loam in the upper 7 inches and yellowish-brown silty clay in the lower 23 inches. Below a depth of 38 inches is mottled, yellowish-brown clay.

Permeability is moderately slow in these soils, and the available moisture capacity is high. The root zone is deep. The reaction is medium acid to neutral in the upper part of the profile and strongly acid in the lower part.

Soils of the Lowell series occur on the uplands in the northern and northeastern parts of Nelson County. Nearly all of the acreage is cleared and used for crops. In severely eroded places, hay and pasture are grown rather than row crops. In the few scattered areas of woodland, locust is dominant, but there is some oak and hickory. Walnut and Osage-orange are common in hedgerows.

Representative profile of Lowell silt loam, 2 to 6 percent slopes:

Ap—0 to 8 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; slightly acid; clear, smooth boundary.

B1t—8 to 15 inches, strong-brown (7.5YR 5/6) silty clay loam; weak, medium, angular blocky structure; firm when moist, slightly sticky when wet; common clay films; few, small, round, soft, dark-brown concretions; few in-

trusions of brown silt loam; neutral; clear, wavy boundary.

B2t—15 to 27 inches, yellowish-brown (10YR 5/6) silty clay; strong, medium, angular blocky structure; very firm when moist, sticky when wet; abundant clay films; few, small, round, soft, dark-brown concretions; slightly acid; clear, smooth boundary.

B3t—27 to 38 inches, yellowish-brown (10YR 5/6) silty clay; few, fine, distinct, light-gray (10YR 7/2) and common, medium, distinct, yellowish-red (5YR 5/6) and light yellowish-brown (10YR 6/4) mottles; moderate, medium and coarse, angular blocky structure; very firm when moist, sticky when wet; common clay films; common, small, round, soft, dark-brown concretions and concretionary material; very strongly acid; gradual, smooth boundary.

C—38 to 52 inches +, yellowish-brown (10YR 5/6) clay; common, medium, strong-brown (7.5YR 5/6) and light-gray (10YR 7/2) mottles; massive; very firm when moist, sticky when wet; dark-brown concretions and concretionary material common to abundant; very strongly acid.

The Ap horizon in severely eroded places is silty clay loam in texture. The color ranges from 3 to 5 in value and from 2 to 6 in chroma.

The color of the B horizon ranges from 10YR to 7.5YR in hue, from 4 to 5 in value, and from 4 to 6 in chroma. The lower part of the B horizon in some profiles contains a thin concretionary layer. Some profiles lack a B1 horizon.

The color of the C horizon ranges from 10YR to 2.5Y in hue, from 4 to 5 in value, and from 4 to 6 in chroma.

The solum generally is about 30 to 44 inches thick. The depth to bedrock is about 4 to 6 feet. Rock fragments cover as much as 5 percent of the surface of some areas and make up as much as 5 percent of the profile. The reaction ranges from neutral to strongly acid in the uppermost part of the profile, but below this it is medium acid to very strongly acid.

Lowell soils are associated with Shelbyville, Nicholson, Faywood, Fairmount, and Eden soils. Lowell soils differ from Shelbyville and Nicholson soils in having a more clayey subsoil, and they lack the fragipan that is characteristic of Nicholson soils. Lowell soils have a thicker subsoil than Faywood soils and are deeper to bedrock. They have a much thicker subsoil than Eden and Fairmount soils, and they lack the high content of rock fragments that is characteristic of those soils. Lowell soils have a lighter colored surface layer than Fairmount soils, and they are deeper to bedrock.

Lowell silt loam, 2 to 6 percent slopes (LwB).—This soil occurs on ridgetops. It has the profile described as representative for the series. The slopes are convex. Included in mapping were a small acreage of Shelbyville and Faywood soils, of soils that have common gray mottles in the lower part of the subsoil, of soils that are yellowish red in the upper part of the subsoil, and of moderately eroded soils.

The natural fertility of this soil is high, and the organic-matter content is medium. The plow layer is easy to till, and it can be tilled throughout a fairly wide range in moisture content without clodding or crusting.

This soil is suited to all the common crops. Corn, tobacco (fig. 11), and alfalfa are grown extensively. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–2; woodland group 2)

Lowell silt loam, 6 to 12 percent slopes, eroded (LwC2).—This soil occurs on and near ridgetops. It differs from that described as representative for the series in that the depth to the silty clay horizon is less and the plow layer is slightly finer textured.

Included in mapping were small acreages of Shelbyville and Faywood soils, of soils that have common gray mottles in the lower part of the subsoil, of soils that are yellowish red in the upper part of the subsoil, of soils that have slopes of less than 6 percent, of severely eroded soils that have a plow layer of silty clay loam, and of uneroded soils.

The natural fertility of this soil is moderate, and the organic-matter content is low. The plow layer is easy to till, in spite of the low organic-matter content, but it can be tilled within only a narrow range in moisture content without clodding or crusting.

This soil is suited to all the common crops (fig. 12). It is not commonly used for tobacco if less sloping and less eroded soils are available. If cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–2; woodland group 2)

Lowell silt loam, 12 to 20 percent slopes, eroded (LwD2).—This soil occurs near ridgetops. It differs from the soil that has the representative profile in that the depth to the silty clay horizon is less and the plow layer contains more of the clayey subsoil. Included in mapping were small acreages of Faywood and Eden soils, of soils that have common gray mottles in the lower part of the subsoil, of severely eroded soils that have a silty clay loam plow layer, and of soils that are uneroded.

The natural fertility of this soil is moderate, and the organic-matter content is low. The plow layer is easy to till, in spite of the low organic-matter content, but it can be tilled only within a somewhat narrow range in moisture content without clodding or crusting.

This soil is suited to only occasional cultivation because the erosion hazard is very severe. It is better suited to pasture and hay. Most grasses and legumes can be grown. (Capability unit IVe–3; woodland group 2)

Lowell silty clay loam, 6 to 12 percent slopes, severely eroded (LyC3).—This soil occurs on and near ridgetops. It differs from the soil that has the representative profile in that the plow layer is more clayey and lighter colored and the depth to the silty clay subsoil is less. Shallow gullies are common. As a result of erosion, the plow layer consists of the clayey subsoil.

Included in mapping were a small acreage of Faywood and Eden soils, a few areas that are moderately eroded, a few areas in which the plow layer is silty clay, and a few areas of Gullied land, acid shaly materials.

The natural fertility of this soil is moderate, and the organic-matter content is very low. The plow layer is somewhat difficult to till because of the low organic-matter content and the silty clay loam texture. The plow layer can be tilled within only a narrow range in moisture content without clodding or crusting.

This soil is suited to only occasional cultivation because the hazard of erosion is very severe. It is better suited to hay or pasture than to cultivated crops. (Capability unit IVe–11; woodland group 3)

Lowell silty clay loam, 12 to 20 percent slopes, severely eroded (LyD3).—This soil occurs near ridgetops. It has convex slopes. It differs from the soil that has the representative profile in that the plow layer is lighter colored and more clayey and the depth to the silty clay subsoil is less. Shallow gullies are common. As a result of erosion, the plow layer consists of the clayey subsoil. Included in mapping were small acreages of Faywood

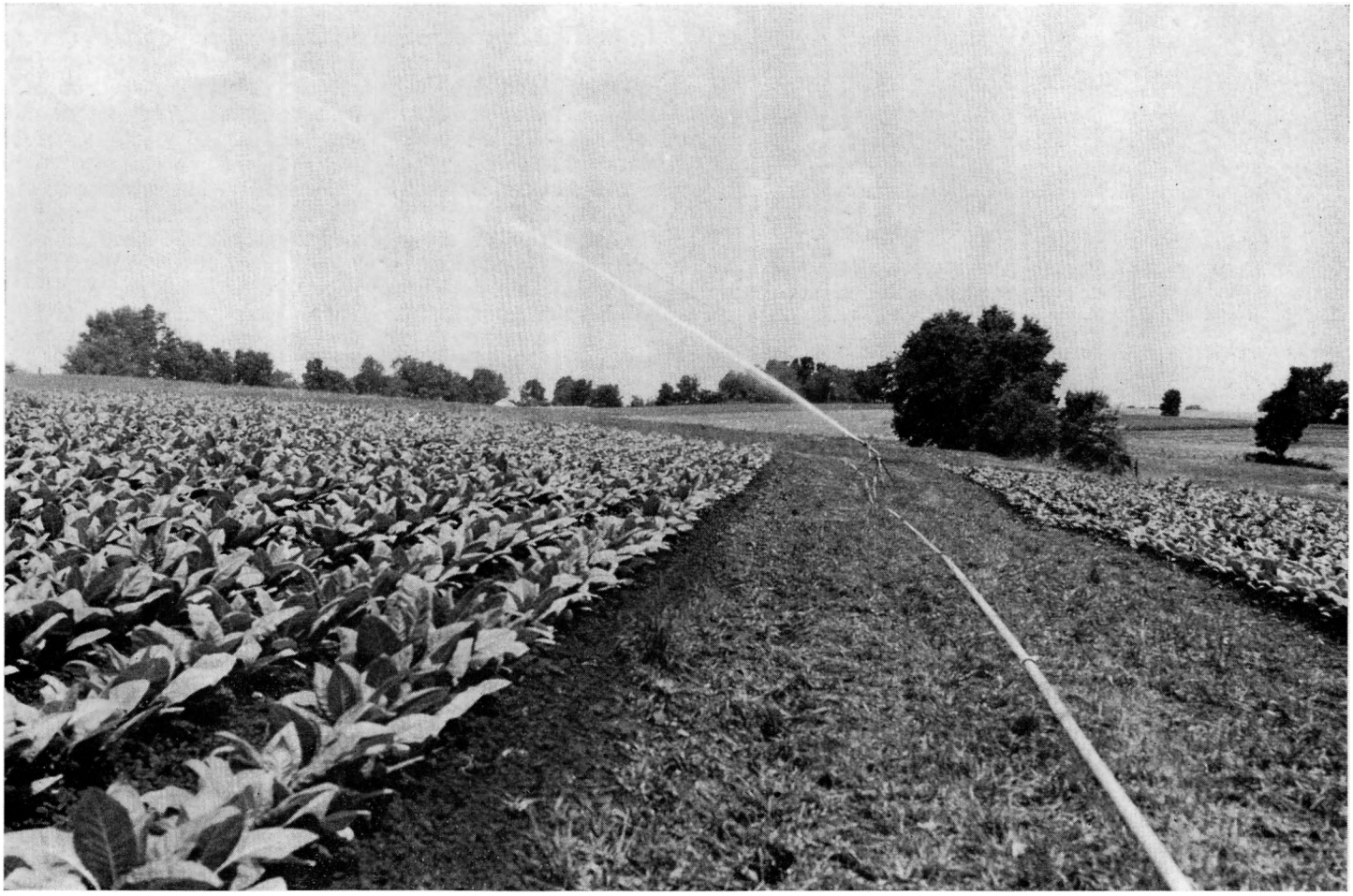

Figure 11.—Irrigation of burley tobacco on Lowell silt loam, 2 to 6 percent slopes.

and Eden soils, a few areas that are moderately eroded, a few areas that have silty clay plow layers, and a few areas of Gullied land, acid shaly materials.

The natural fertility of this soil is moderate, and the organic-matter content is very low. The plow layer is somewhat difficult to till because of the very low organic-matter content and the silty clay loam texture. The plow layer can be tilled within only a narrow range in moisture content without clodding or crusting.

This soil is unsuited to cultivation because of the effects of erosion and the hazard of further erosion. Pasture, woodland, and wildlife habitat are better uses. (Capability unit VIe–2; woodland group 3)

Markland Series

The Markland series consists of moderately well drained to well drained soils that have a clayey, moderately slowly permeable subsoil. These soils are on stream terraces. They developed in old clayey slack-water sediment.

In a representative profile, the plow layer is brown silt loam about 6 inches thick. The subsoil is yellowish-brown, mottled silty clay or clay about 28 inches thick.

Soils of the Markland series occur north and west of Boston in Nelson County. Nearly all of the acreage has been cleared. Some of the acreage is idle and is reverting to woodland. Some already has young stands of redcedar, oak, hickory, elm, and maple.

Representative profile of Markland silt loam, 2 to 12 percent slopes:

Ap—0 to 6 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable when moist; very strongly acid; clear, smooth boundary.

B21t—6 to 17 inches, yellowish-brown (10YR 5/6) silty clay; few, medium, distinct, light brownish-gray (2.5Y 6/2) mottles; weak, medium, angular blocky structure; very firm when moist, slightly sticky when wet; common roots; few clay films; very strongly acid; gradual, smooth boundary.

B22t—17 to 34 inches, yellowish-brown (10YR 5/6) silty clay or clay; common, fine, distinct, gray (5Y 5/1) mottles; weak, medium, angular blocky structure; very firm when moist, slightly sticky when wet; few clay films; strongly acid; gradual smooth boundary.

C—34 to 50 inches +, light olive-brown (2.5Y 5/4) silty clay; common, coarse, distinct, gray (5Y 5/1) and common, coarse, faint, light olive-brown (2.5Y 5/6) mottles; weak, medium, angular blocky structure; very firm when moist; moderate alkaline.

The color of the Ap horizon ranges from 4 to 5 in value and from to to 3 in chroma. In severely eroded places, the Ap horizon is silty clay. In a few places that have not been plowed there is a 1- to 2-inch A1 horizon of very dark grayish-brown (10YR 3/2) silt loam and a 4- to 6-inch, brown (10YR 5/3) A2 horizon.

The color of the B horizon ranges from 10YR to 7.5YR in

hue and from 4 to 6 in chroma. The R21t horizon in some profiles is free of mottles. The texture of the B horizon in some profiles is clay.

Generally, the solum is about 30 to 45 inches thick. In some profiles the C horizon is clay, and in some this horizon contains a few lime nodules.

In the gently sloping soils of this series, the reaction is generally very strongly acid in the A and B horizons and mildly alkaline in the C horizon. In some of these soils the C horizon is calcareous. In the steeper soils of the series the upper part of the profile is medium acid to mildly alkaline.

Markland soils are associated with Bedford, McGary, and Lawrence soils. Markland soils are less acid, more clayey in the subsoil, and better drained than Bedford and Lawrence soils. They lack the fragipan that is characteristic of Bedford and Lawrence soils. Markland soils are better drained than McGary soils and are more brown and less gray and less mottled.

Markland silt loam, 2 to 12 percent slopes (MkC).—This soil is on stream terraces. It has the profile described as representative for the series. Included in mapping were small areas of moderately eroded soils.

The natural fertility of this soil is moderate, the organic-matter content is medium, and the reaction in the upper part of the profile is strongly acid to very strongly acid. The available moisture capacity is high. The plow layer is easy to till, and it can be tilled throughout a fairly wide range in moisture content without clodding or crusting. The root zone is deep.

This soil is suited to most of the commonly grown crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe-2; woodland group 2)

Markland silt loam, 12 to 20 percent slopes, eroded (MkD2).—This soil occurs as narrow bands along drainageways and has convex slopes. It has a slightly finer textured plow layer than the soil that has the representative profile. Included in mapping were small areas of uneroded soils and of severely eroded soils.

The natural fertility of this soil is moderate, the organic-matter content is low, and the reaction in the upper part of the profile is strongly acid to very strongly acid. The available moisture capacity is high. The plow layer is easy to till, in spite of the low organic-matter content, and it can be tilled throughout a fairly wide range in moisture content without clodding or crusting. The root zone is deep.

This soil is unsuited to cultivation because of the slopes and the hazard of further erosion. Pasture, woodland, and wildlife habitat are better uses. Most grasses and legumes can be grown. (Capability unit VIe-1; woodland group 2)

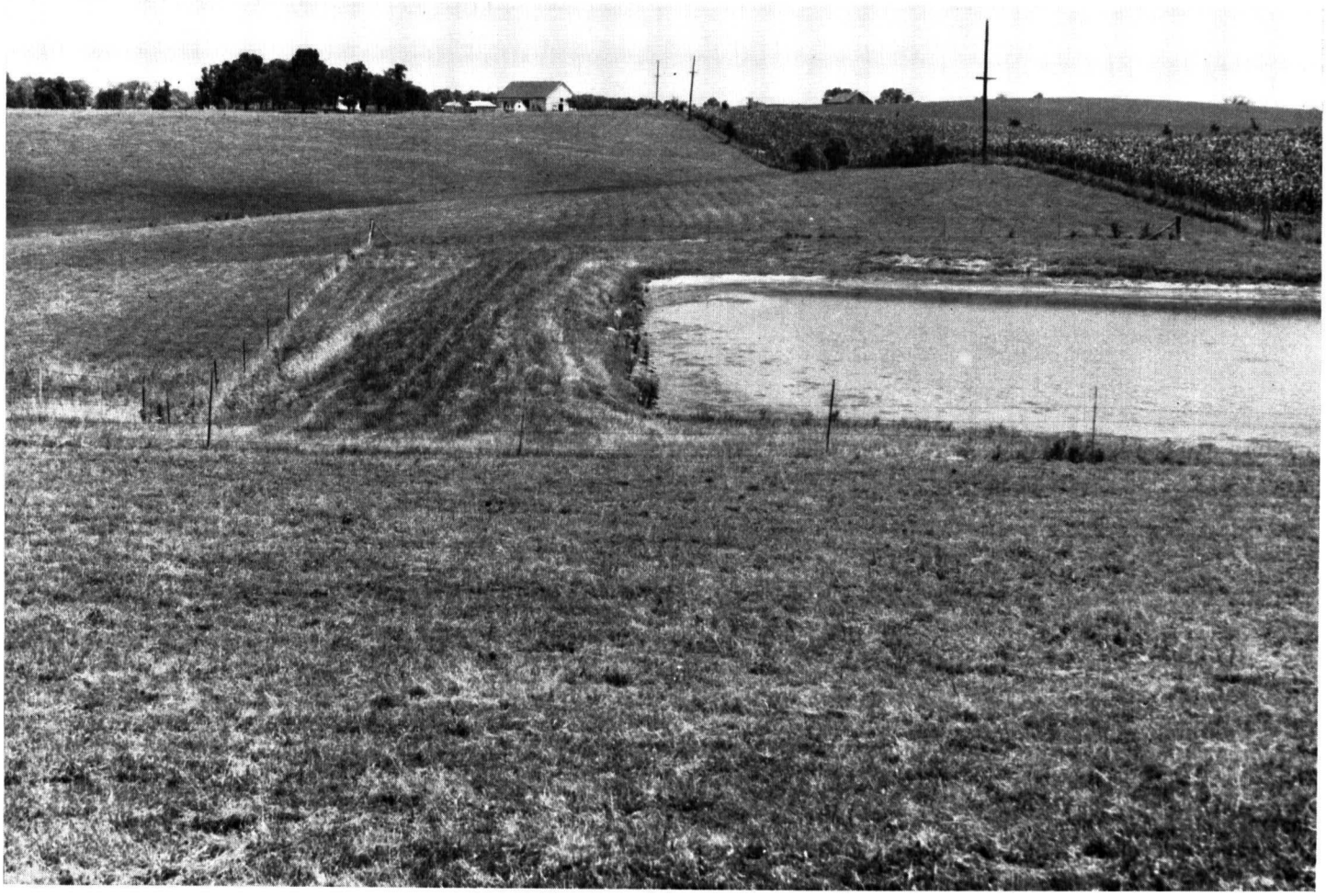

Figure 12.—**Pasture, corn, and farm pond on Lowell silt loam, 6 to 12 percent slopes, eroded. Lowell silt loam, 2 to 6 percent slopes, is on ridgetops.**

Markland silty clay, 6 to 12 percent slopes, severely eroded (MlC3).—This soil occurs as narrow bands along drainageways and has convex slopes. It has a lighter colored, finer textured plow layer than the soil that has the representative profile. As a result of erosion, the plow layer consists mostly of the clayey subsoil. Shallow gullies are common. Included in mapping were a few small areas of moderately eroded soils and of Gullied land, calcareous shaly materials.

The natural fertility of this soil is moderately low, the organic-matter content is very low, and the reaction in the upper part of the profile is strongly acid to very strongly acid. The available moisture capacity is moderate. The clayey plow layer is difficult to till, and it can be tilled only within a narrow range of moisture content without clodding or crusting. The root zone is moderately deep.

This soil is unsuited to cultivation because of the effects of erosion and the hazard of further erosion. It can be used for pasture, but plants are difficult to establish and maintain. Woodland and wildlife habitat are suitable uses. (Capability unit VIe-4; woodland group 3)

Markland silty clay, 12 to 20 percent slopes, severely eroded (MlD3).—This soil occurs as narrow bands along drainageways and has convex slopes. It has a lighter colored, finer textured plow layer than the soil that has the representative profile. As a result of erosion, the plow layer consists mostly of the clayey subsoil. Shallow gullies are common. Included in mapping were a few small areas of moderately eroded soils and of Gullied land, calcareous shaly materials.

The natural fertility of this soil is moderately low, the organic-matter content is very low, and the reaction in the uppermost part of the profile is medium acid to neutral. The available moisture capacity is moderate. The clayey plow layer is difficult to till, and it can be tilled only within a narrow range of moisture content without clodding or crusting. The root zone is moderately deep.

This soil is unsuited to cultivation because of the effects of erosion and the hazard of further erosion. It is poorly suited to pasture because stands of grasses and legumes are difficult to establish and maintain. Woodland and wildlife habitat are suitable uses. (Capability unit VIIe-1; woodland group 3)

McGary Series

The McGary series consists of somewhat poorly drained soils that have a clayey subsoil. These soils developed in clayey sediment deposited on stream terraces.

In a representative profile, the plow layer is grayish-brown silt loam about 7 inches thick. The subsoil is very firm silty clay that is light brownish gray and mottled to a depth of about 26 inches and yellowish brown and mottled below that. At a depth of about 32 inches is light olive-brown, mottled silty clay or clay that extends to a depth of at least 57 inches.

The natural fertility of these soils is moderately low, and the organic-matter content is low. A slowly permeable subsoil causes a seasonal high water table that limits root growth. The available moisture capacity is high. Although low in organic-matter content, the plow layer is easy to till.

Soils of the McGary series occur north and west of Boston in Nelson County. Most of the acreage is used for pasture (fig. 13). Small acreages are used for row crops and hay and a few areas for woodland.

Representative profile of McGary silt loam:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; friable when moist; few, small, round, hard, brown concretions; very strongly acid; clear, smooth boundary.

B21t—7 to 26 inches, light brownish-gray (2.5Y 6/2) silty clay; many, medium, distinct mottles of yellowish-brown (10YR 5/4); moderate, medium, angular blocky structure; very firm when moist, slightly sticky when wet; few clay films; few, small, round, hard, black and brown concretions; very strongly acid; gradual, smooth boundary.

B22t—26 to 32 inches, yellowish-brown (10YR 5/6) silty clay; approximately 30 percent coarse, distinct mottles of gray (5Y 5/1) and strong brown (7.5YR 5/6); weak, medium, angular blocky structure; very firm when moist, slightly sticky when wet; few clay films; few, small, round, black concretions; very strongly acid; gradual, smooth boundary.

C1—32 to 38 inches, light olive-brown (2.5Y 5/4) heavy silty clay; common, medium, distinct mottles of light olive-brown (2.5Y 5/6) and gray (5Y 5/1); weak, fine, angular blocky structure; very firm when moist, sticky when wet; few, small, round, black concretions; very strongly acid; gradual, smooth boundary.

C2—38 to 57 inches +, light olive-brown (2.5Y 5/4) clay; common, medium, distinct mottles of gray (5Y 5/1) and light olive-brown (2.5Y 5/6); weak, medium, angular blocky structure; very firm when moist, very sticky when wet; few, small, round, black concretions; moderately alkaline.

The Ap horizon ranges from yellowish brown (10YR 5/4) to grayish brown (2.5Y 5/2) in color. The B horizon in some profiles is more mottled. The texture of the B21t in some profiles is silty clay loam. The C horizon in some profiles contains a few lime nodules.

The solum is about 28 to 40 inches thick. The reaction is strongly to very strongly acid in the uppermost part of the profile and neutral to moderately alkaline in the lower part.

McGary soils are associated with Markland, Bedford, and Lawrence soils. They are less brown and more gray and more mottled than Markland and Bedford soils. They have a more clayey subsoil than Bedford and Lawrence soils, and they lack the fragipan that is characteristic of those soils.

McGary silt loam (0 to 2 percent slopes) (Mr).—This soil occurs mostly in wet areas on stream terraces. Included in mapping was a small acreage of poorly drained soils that have a plow layer of dark grayish-brown silty clay loam and a thick subsoil of gray silty clay.

This soil is slow to warm up and dry out because of the slow permeability of the subsoil. It is flooded infrequently. Low places are often ponded for several days after heavy rains.

This soil is suited to crops that tolerate moderate wetness. It is poorly suited to tobacco and alfalfa. Artificial drainage widens the selection of crops. Open ditch drainage generally is to be preferred. (Capability unit IIIw-1; woodland group 10)

Melvin Series

The Melvin series consists of poorly drained soils that developed in recent alluvium washed mostly from soils of limestone origin but containing small amounts of material derived from shale and sandstone.

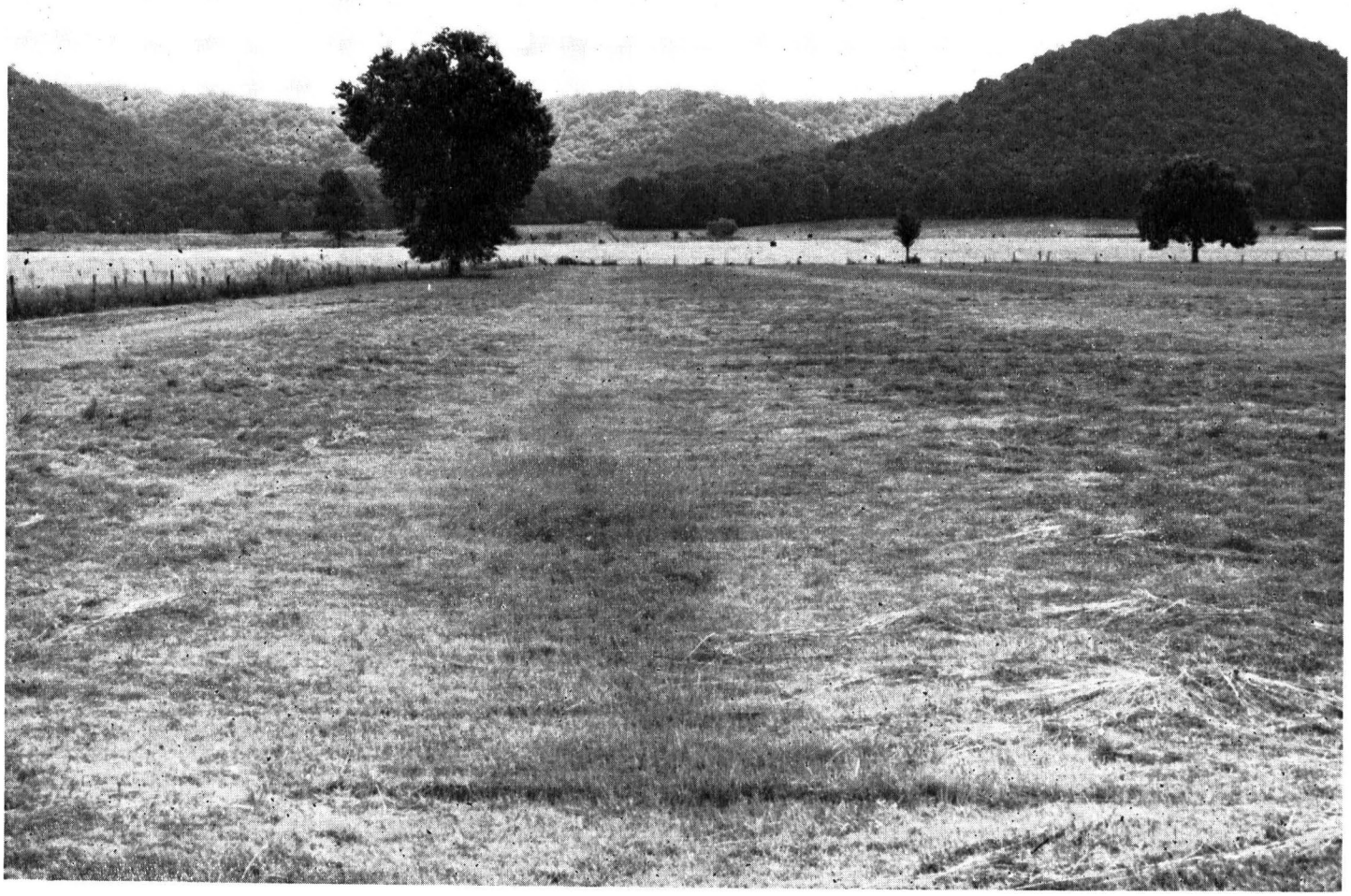

Figure 13.—Pasture on McGary silt loam. Knobs are in the background.

In a representative profile, the plow layer is grayish-brown silt loam about 6 inches thick. The subsoil, about 24 inches thick, is silt loam that is olive gray and mottled in the upper part and mottled gray, grayish brown, light yellowish brown, and light olive brown in the lower part. Below this is gray, mottled silt loam that extends to a depth of 50 inches or more.

The natural fertility of these soils is moderate, the organic-matter content is low, and the reaction is neutral. Permeability is moderate, and the available moisture capacity is high. The water table is high through the early part of the growing season. Flooding during the growing season is common. The plow layer is easy to till, in spite of the low organic-matter content. The root zone is deep.

Soils of the Melvin series occur on low flood plains throughout Nelson County. Nearly all the acreage is used for pasture. A few areas are wooded, mainly with sycamore, gum, maple, yellow-poplar, and oaks.

Representative profile of Melvin silt loam:

Ap—0 to 6 inches, grayish-brown (2.5Y 5/2) silt loam; few, fine, distinct, light olive-brown (2.5Y 5/4) and common, medium, faint, dark-gray (5Y 4/1) mottles; weak, fine, granular structure; friable; neutral; clear, smooth boundary.

B1g—6 to 18 inches, olive-gray (5Y 5/2) silt loam; common, fine, distinct, light olive-brown (2.5Y 4/4) and common, fine, faint, grayish-brown (2.5Y 5/2) mottles; weak, fine, granular structure or structureless (massive); firm; neutral; gradual, smooth boundary.

B2g—18 to 30 inches, mottled gray (5Y 5/1), grayish-brown (2.5Y 5/2), light yellowish-brown (2.5Y 6/4), and light olive-brown (2.5Y 5/4) silt loam; weak, coarse, subangular blocky structure or structureless (massive); firm; neutral; gradual, smooth boundary.

Cg—30 to 51 inches +, gray (5Y 5/1) heavy silt loam; few, medium, distinct, brownish-yellow (10YR 6/6) and light olive-brown (2.5Y 5/4) mottles; structureless (massive); firm; few, round, soft, brown concretions; neutral.

The color of the Ap horizon is 4 to 5 in value. That of the B1g horizon is 5Y or 2.5Y in hue. In texture, the B2g horizon ranges from silt loam to silty clay loam, and the Cg horizon from heavy silt loam to silty clay.

The reaction ranges from medium acid to mildly alkaline. Small pebbles make up as much as 5 percent of a few profiles.

Melvin soils are associated with Huntington, Lindside, Newark, and Dunning soils. Melvin soils are more poorly drained and are grayer than Huntington, Lindside, and Newark soils. They are lighter colored and coarser textured than Dunning soils.

Melvin silt loam (0 to 2 percent slopes) (Mt).—This soil is on flood plains. Included in mapping were a small acreage of Newark soils and a few areas that have a silty clay loam plow layer.

This soil is suited only to plants that tolerate wetness.

Drainage by tile or open ditches widens the selection of crops. (Capability unit IIIw-5; woodland group 4)

Newark Series

The Newark series consists of somewhat poorly drained soils that developed in recent alluvium washed chiefly from soils of limestone origin but containing some material derived from shale and sandstone.

In a representative profile, the plow layer is dark grayish-brown silt loam about 12 inches thick. The subsoil, about 26 inches thick, is brown, mottled silt loam in the upper part and gray, more mottled silty clay loam in the lower part. Below a depth of about 38 inches is gray, mottled silty clay loam.

The natural fertility of these soils is moderate, the organic-matter content is medium, and the reaction in the upper part is neutral. Permeability is moderate, and the available moisture capacity is high. Floods occur yearly in winter, early in spring, and occasionally during the growing season. The water table is about 1 foot below the surface until late in spring. The plow layer is easy to till.

Soils of the Newark series occur on flood plains throughout Nelson County. Nearly all of the acreage is cleared. Corn, soybeans, hay, and pasture are the main crops.

Representative profile of Newark silt loam:

Ap—0 to 12 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable when moist; few, small, round, soft, brown concretions; common roots; neutral; clear, smooth boundary.

B1g—12 to 24 inches, brown (10YR 5/3) silt loam; common, medium, faint, grayish-brown (2.5Y 5/2) mottles; few, fine, faint, light olive-gray (5Y 6/2) mottles; and few, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium and fine, subangular blocky structure; friable when moist; few roots; few, round, soft, brown concretions; neutral; clear, smooth boundary.

B2g—24 to 38 inches, gray (5Y 5/1) light silty clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) and light olive-brown (2.5Y 5/6) mottles; and few, medium, faint olive-gray (5Y 6/2) mottles; weak, fine, subangular blocky structure; firm when moist, slightly sticky when wet; few, small, round, soft, brown concretions; few pebbles; medium acid; gradual, smooth boundary.

Cg—38 to 68 inches +, gray (N 6/0) light silty clay loam; common, coarse, distinct, light olive-brown (2.5Y 5/4) mottles; structureless (massive); firm when moist, slightly sticky when wet; few strong-brown concretions; medium acid.

The color of the Ap horizon ranges from 10YR to 2.5Y in hue, from 4 to 5 in value, and from 2 to 3 in chroma. The matrix color of the B1g horizon is 2.5Y to 10YR in hue and 4 to 5 in value. The matrix color of the B2g horizon is 5Y to 2.5Y in hue, 4 to 6 in value, and 1 to 4 in chroma. The texture of the B2g and Cg horizons in some profiles is silt loam.

A small amount of gravel occurs throughout some profiles. The reaction is medium acid to mildly alkaline.

Newark soils are associated with Huntington, Lindside, Melvin, and Dunning soils. Newark soils are less well drained than Huntington and Lindside soils, but they are more gray and more mottled in the subsoil. Newark soils lack the gravel content that is characteristic of Huntington silt loam, gravelly variant. Newark soils are better drained than Melvin soils and are less gray and less mottled in the surface layer and in the upper part of the subsoil. Newark soils are better drained and coarser textured than Dunning soils. They lack the dark-colored surface layer that is characteristic of Dunning soils.

Newark silt loam (0 to 2 percent slopes) (Ne).—This soil occurs on flood plains. Included in mapping were areas of a soil that has a silty clay loam plow layer and areas of soils located in valleys in the Knobs Region that have strongly acid profiles and are 10 to 20 percent shale fragments and gravel.

This soil is suited to crops that tolerate moderate wetness. It is poorly suited to tobacco and alfalfa. Tile drainage widens the selection of crops (fig. 14). Hay and pasture are better than row crops for areas not drained. (Capability unit IIw-4; woodland group 4)

Nicholson Series

The Nicholson series consists of well drained to moderately well drained soils that have a fragipan. These soils developed in loess deposited over residuum weathered from thin-bedded shale and limestone.

In a representative profile the plow layer is brown silt loam about 8 inches thick. The subsoil is about 28 inches thick. The uppermost 8 inches is strong-brown silt loam, the middle part is strong-brown and yellowish-brown silty clay loam, and the lowest 6 inches is a mottled silty clay loam fragipan. At a depth of about 36 inches is mottled clay.

The natural fertility of these soils is moderate, the organic-matter content is medium, and the reaction is strongly acid. Permeability is moderate above the fragipan and slow in the fragipan. The available moisture capacity is moderate. The plow layer is easy to till, and it can be tilled throughout a fairly wide range in moisture content without clodding or crusting. The root zone is moderately deep to deep.

Soils of the Nicholson series occur on the upland in the northern and northeastern parts of Nelson County. All the acreage has been cleared and is used for row crops, hay, and pasture.

Representative profile of Nicholson silt loam, 2 to 6 percent slopes:

Ap—0 to 8 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; many roots; slightly acid; clear, smooth boundary.

B1—8 to 16 inches, strong-brown (7.5YR 5/6) heavy silt loam; weak, fine, subangular blocky structure; friable; many roots; few, small, round, black concretions; few worm casts; strongly acid; clear, smooth boundary.

B21t—16 to 25 inches, strong-brown (7.5YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; firm when moist; slightly sticky when wet; few roots; common clay films; common, small, round, hard, black concretions; strongly acid; clear, smooth boundary.

B22t—25 to 30 inches, yellowish-brown (10YR 5/6) silty clay loam; common, fine, faint mottles of light yellowish-brown (10YR 6/4); moderate, medium, subangular blocky structure; firm when moist; slightly sticky when wet; few roots; common clay films; common, small, round, hard, black concretions; strongly acid; clear, smooth boundary.

Bx—30 to 36 inches, mottled light-gray (10YR 7/1), yellowish-brown (10YR 5/6), and strong-brown (7.5YR 5/6) silty clay loam; weak, fine, subangular blocky structure; very firm when moist, compact, slightly sticky when wet; few clay films; many, small, round, black concretions; strongly acid; clear, wavy boundary.

IIC—36 to 52 inches +, mottled yellowish-brown (10YR 5/6), light olive-brown (2.5Y 5/6), and light brownish-gray (2.5Y 6/2) clay; structureless (massive); very firm when

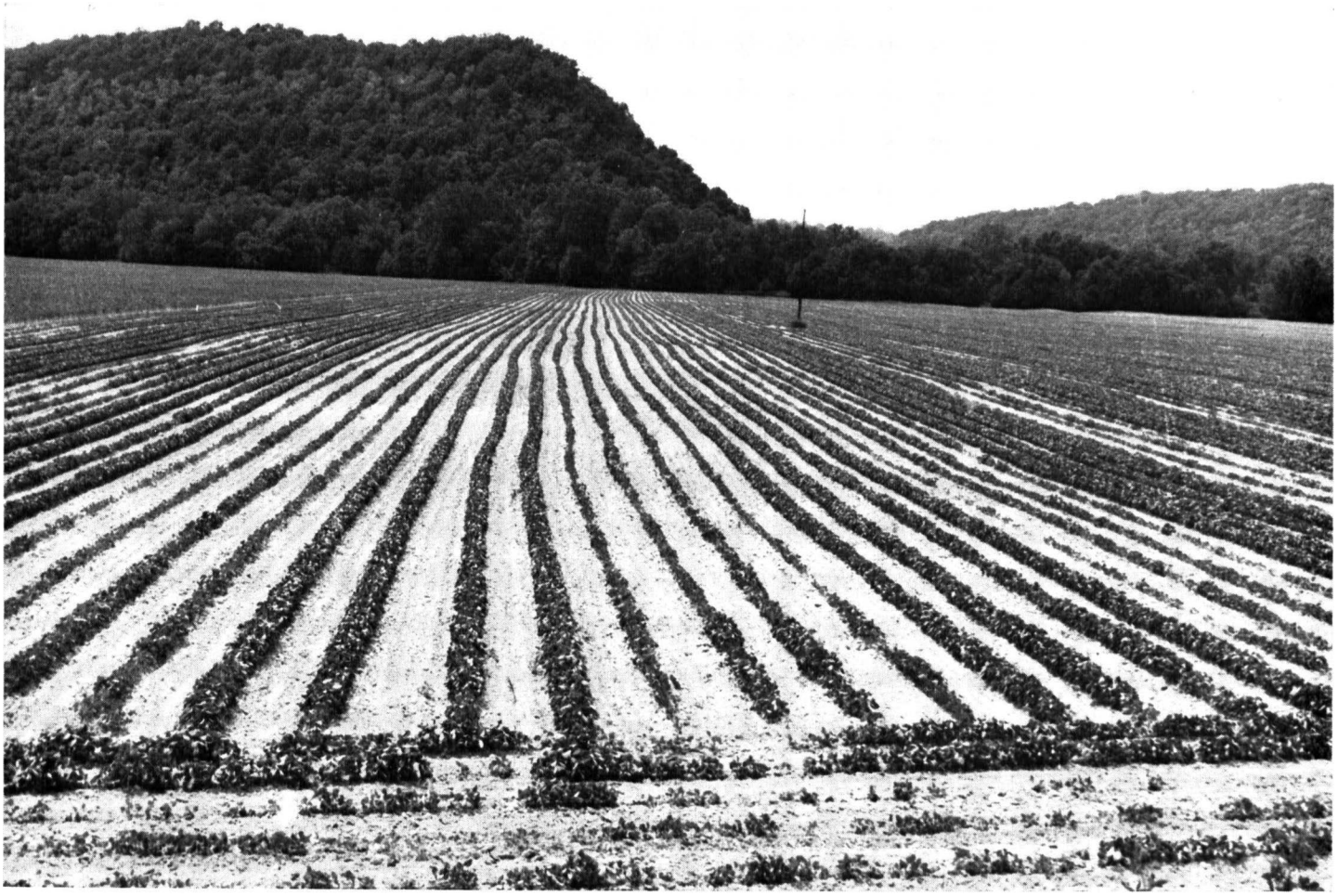

Figure 14.—Soybeans on Newark silt loam that has been tile drained.

moist; very sticky when wet; abundant, small, round concretions and concretionary material; slightly acid.

The color of the Ap horizon ranges from 4 to 5 in value and from 2 to 3 in chroma. The color of the B21t and the B22t horizons ranges from 10YR to 7.5YR in hue, from 4 to 5 in value, and from 4 to 6 in chroma. In texture the B horizon ranges from silt loam to silty clay loam (clay content, 24 to 32 percent).

The solum is about 30 to 40 inches thick. The depth to bedrock is about 5 to 8 feet, and the depth to the fragipan is about 24 to 32 inches. The reaction is strongly to very strongly acid.

In some places, concretions are more numerous in the uppermost part of the B horizon than in the typical profile. In others, siltstone fragments make up a small percent of the profile.

Nicholson soils are associated with Shelbyville, Lowell, and Eden soils. They have a lighter colored plow layer than Shelbyville soils, and they have a fragipan, which Shelbyville soils lack. Nicholson soils have a redder and coarser textured B horizon than Lowell and Eden soils, which lack a fragipan. Nicholson soils have a thicker B horizon than Eden soils and lack the flagstones that are characteristic of Eden soils.

Nicholson silt loam, 2 to 6 percent slopes (NhB).—This soil occurs on moderately broad ridgetops. Included in mapping were small areas of Bedford soils, of soils that have 6 to 12 percent slopes, and of moderately and severely eroded Nicholson soils that have a lighter colored plow layer and lower organic-matter content than the uneroded soil.

This soil is suited to all of the commonly grown crops. The fragipan restricts the movement of water, but it does not seem to affect crops. There is a moderate hazard of erosion when cultivated crops are grown. For the included soils that have 6 to 12 percent slopes, the erosion hazard is severe and careful management is needed. (Capability unit IIe-10; woodland group 5)

Otway Series

The Otway series consists of somewhat excessively drained soils that have a clayey subsoil. These soils developed in residuum weathered from calcareous shale and soft limestone.

In a representative profile, the plow layer is very dark grayish-brown silty clay loam about 9 inches thick. The subsoil, about 8 inches thick, is mottled, light yellowish-brown clay. Below this is gray and light yellowish-brown, calcareous clay and shale, and at a depth of about 42 inches is soft, calcareous shale.

The natural fertility of these soils is moderately low, the organic-matter content is high, and the reaction is

373-720—71——3

alkaline. Permeability is moderately slow. The plow layer is difficult to till, in spite of the high organic-matter content, because the texture ranges from silty clay to clay loam. The root zone is moderately deep.

Soils of the Otway series occur in an area that extends from Bardstown southeast and northwest to the county line. Smaller areas occur in the southern and western parts of Nelson County. Most of the acreage is in pasture or brush. Some is in woodland of redcedar and a little scrubby oak and other hardwoods. The calcareous shale (marl) is a source of lime.

Representative profile of Otway silty clay loam, 6 to 12 percent slopes:

Ap—0 to 9 inches, very dark grayish-brown (10YR 3/2) silty clay loam; moderate, fine, granular structure; friable; abundant roots; moderately alkaline; clear, wavy boundary.

B2—9 to 17 inches, light yellowish-brown (2.5Y 6/4) clay; many, medium, distinct, light olive-gray (5Y 6/2) and light-gray (5Y 7/1) variegations; weak, medium, angular blocky structure; very firm, plastic; few organic stains in root channels; moderately alkaline and calcareous; clear, smooth boundary.

C1—17 to 30 inches, gray (5Y 6/1) clay; common, fine, distinct, light yellowish-brown (2.5Y 6/4) and few, fine, faint, light-gray (5Y 7/1) variegations; weak, medium, angular blocky structure to structureless (massive); very firm; plastic; few roots; moderately alkaline and calcareous; gradual, smooth boundary.

C2—30 to 42 inches, light yellowish-brown (2.5Y 6/4) clay and clay shale; common, coarse variegations of gray (5Y 6/1); massive, some relict structure of weathered shale; very firm, plastic, sticky; moderately alkaline and calcareous; gradual, smooth boundary.

R—42 inches +, gray and olive, slightly weathered, soft, calcareous shale.

The color of the Ap horizon ranges from 1 to 2 in chroma. The matrix color of the B2 horizon is 5 to 6 in value and 4 to 6 in chroma. In texture the B2 horizon ranges from clay to silty clay and clay loam. The color of the C horizon ranges from 10YR to 5Y in hue and from 4 to 8 in chroma. In texture the C horizon ranges from clay to silty clay and clay loam.

The solum is about 13 to 21 inches thick. The depth to bedrock is about 24 to 45 inches. The reaction of the A and B horizons is mildly alkaline to moderately alkaline. Some profiles contain a few limestone fragments.

Otway soils are associated with Beasley, Corydon, and Shrouts soils. They have a darker colored surface layer and a thinner, more yellow and less red subsoil than Beasley and Corydon soils, and they lack the underlying hard rock that is characteristic of Corydon soils. Otway soils differ from Shrouts soils in having a darker colored and coarser textured surface layer.

Otway silty clay loam, 6 to 12 percent slopes (OtC).—This soil occurs as bands on valley walls. It has the profile described as representative for the series. The slopes are concave. Included in mapping were a small acreage of Beasley and Shrouts soils and a few areas of soils that have a silt loam surface layer.

This soil is better suited to pasture and hay than to row crops. It is suited to only occasional cultivation because the erosion hazard is very severe. Most pasture grasses and legumes can be grown. (Capability unit IVe–6; woodland group 7)

Otway silty clay loam, 12 to 30 percent slopes (OtE).—This soil occurs on valley walls. It has concave slopes. Included in mapping were a small acreage of Beasley and Shrouts soils, a few areas of a soil that has a silt loam surface layer, and some areas in which the slope is more than 30 percent.

This soil is severely limited, mainly by the erosion hazard unless cover is maintained. It is suited to pasture, woodland, and wildlife habitat. (Capability unit VIe–1; woodland group 7)

Pembroke Series

The Pembroke series consists of deep, well-drained soils that developed chiefly in residuum weathered from limestone but were influenced by a small component of loess. These soils are on uplands. Some areas have a karst topography, and sinkholes in small depressions are common.

In a representative profile, the plow layer is dark-brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches. The upper 19 inches is yellowish-red, friable to firm silty clay loam, and the lower part is dark-red, firm silty clay loam over dark-red, very firm silty clay.

Permeability is moderate, and the available moisture capacity is high. The root zone is deep.

The largest acreages of Pembroke soils in Nelson County are in an area that extends from Bardstown southeast to Botland and northwest to the county line. Most of the acreage is cleared and used for crops and pasture.

Representative profile of Pembroke silt loam, 2 to 6 percent slopes:

Ap—0 to 9 inches, dark-brown (7.5YR 3/2) silt loam; weak to moderate, fine, crumb structure; very friable; abundant roots; neutral; clear, smooth boundary.

B1t—9 to 17 inches, yellowish-red (5YR 4/6) light silty clay loam; weak, fine and medium, subangular blocky structure; friable; common roots; few thin clay films on peds; root openings and worm casts filled with dark-brown silt loam; few, small, round, soft, dark reddish-brown concretions; slightly acid; gradual, smooth boundary.

B21t—17 to 28 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, medium, subangular blocky structure; firm, slightly sticky; common clay films on peds; few, small, round, soft, dark reddish-brown concretions; common roots; slightly acid; gradual, smooth boundary.

B22t—28 to 39 inches, dark-red (2.5YR 3/6) silty clay loam; moderate, medium, subangular blocky structure; firm, slightly sticky; few roots; common clay films on peds; common, small, round, soft, dark reddish-brown concretions and concretionary stains; few small chert fragments; medium acid; gradual, smooth boundary.

B3t—39 to 60 inches +, dark-red (2.5YR 3/6) silty clay; weak to moderate, medium, subangular blocky structure; very firm, slightly sticky; few brown (7.5YR 5/4) and reddish-yellow (7.5YR 6/4) silt coatings on peds; few roots; few clay films on peds; common, small, round, soft, dark reddish-brown concretions and concretionary material; few small chert fragments; medium acid.

The color of the Ap horizon ranges from 10YR to 5YR in hue and from 2 to 3 in chroma. In texture this horizon is commonly silt loam, but it ranges to silty clay loam in places that are severely eroded. The color throughout the B horizon is 3 to 5 in value. The color of the B1t horizon ranges from 4 to 6 in chroma. Some profiles do not have a B1t horizon.

The B3t horizon is as much as 12 percent chert fragments from ½ inch to 8 inches in diameter. The B22t horizon in some profiles is silty clay.

The solum is about 55 to 75 inches thick. The depth to bedrock is about 5 to 9 feet. The reaction is commonly me-

dium acid, but it ranges to strongly acid except in limed places, which have a nearly neutral reaction.

Pembroke soils are associated with Beasley, Corydon, Hagerstown, and Russellville soils. Pembroke soils have a less clayey subsoil than Beasley, Corydon, and Hagerstown soils. Pembroke soils lack the calcareous C horizon that is characteristic of Beasley soils, and they are deeper to bedrock than Corydon soils. They are redder than Russellville soils, and they lack a fragipan.

Pembroke silt loam, 0 to 2 percent slopes (PbA).—This soil occurs on the broader ridgetops. It has straight slopes. Included in mapping were small acreages of Crider and Russellville soils, and of a few soils that have more than 2 percent slopes.

The natural fertility of this soil is high, and the organic-matter content is medium. The plow layer is easy to till throughout a wide range in moisture content without clodding or crusting.

This soil is suited to all of the commonly grown crops (fig. 15). (Capability unit I–3; woodland group 1)

Pembroke silt loam, 2 to 6 percent slopes (PbB).—This soil occurs mostly on broad ridgetops. It has the profile described as typical for the series. Included in mapping were small acreages of Crider soils, of soils that have a lighter colored plow layer, of moderately eroded soils, and of soils that have slopes of less than 2 percent.

The natural fertility of this soil is high, and the organic-matter content is medium. The plow layer is easy to till throughout a wide range of moisture content without clodding or crusting.

This soil is suited to all of the commonly grown crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–1; woodland group 1)

Pembroke silt loam, 6 to 12 percent slopes (PbC).—This soil occurs on and near ridgetops. It has convex slopes. Included in mapping were small acreages of Beasley and Hagerstown soils and a few areas of moderately eroded soils.

The natural fertility of this soil is moderately high, and the organic-matter content is medium. The plow layer is easy to till and can be worked throughout a wide range in moisture content without clodding or crusting.

This soil is suited to all of the commonly grown crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–1; woodland group 1)

Pembroke silty clay loam, 6 to 12 percent slopes, severely eroded (PeC3).—This soil is on and near ridgetops. It has convex slopes. It has a redder, finer textured plow layer than the soil that has the representative profile. As a result of erosion, the plow layer is mostly in the subsoil. Included in mapping were a few areas of

Figure 15.—**Burley tobacco and corn on Pembroke silt loam, 0 to 2 percent slopes.**

moderately eroded soils and of soils that have slopes of more than 12 percent.

The natural fertility of this soil is moderately high, and the organic-matter content is very low. The plow layer is somewhat difficult to till because of the silty clay loam texture. It can be tilled only within a somewhat narrow range of moisture content without clodding or crusting.

This soil is suited to the commonly grown crops, but cultivated crops should be grown only occasionally because the erosion hazard is very severe. Pasture and hay are better uses. (Capability unit IVe–1; woodland group 3)

Robertsville Series

The Robertsville series consists of poorly drained soils that have a fragipan. These soils are on stream terraces and uplands. Those on stream terraces developed in old alluvium washed mainly from soils of limestone origin, and those on uplands in loess deposited over residuum weathered from limestone.

In a representative profile, the plow layer is grayish-brown silt loam about 7 inches thick. The subsoil, about 33 inches thick, is gray and mottled. The upper part is friable silt loam. The lower part is a silty clay loam fragipan. Below a depth of 40 inches is mottled, light-gray clay.

The natural fertility of these soils is moderately low, the organic-matter content is low, and the reaction is very strongly acid. Permeability is very slow, and the available moisture capacity is moderate. The plow layer is easy to till, in spite of the low organic-matter content. The root zone is shallow.

Soils of the Robertsville series occur on stream terraces and in upland depressions in all parts of Nelson County except the northeastern part. About half the acreage is wooded, mainly with gum, sycamore, beech, yellow-poplar, and water-tolerant oak. The cleared acreage is used mostly for pasture.

Representative profile of Robertsville silt loam:

Ap—0 to 7 inches, grayish-brown (2.5Y 5/2) silt loam; weak, fine, granular structure; friable; few small pebbles; medium acid; clear, smooth boundary.

B2g—7 to 18 inches, gray (5Y 6/1) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; friable; common roots; few small pebbles; very strongly acid; clear, smooth boundary.

A′ & B′x1g—18 to 28 inches, gray (N 6/0) silty clay loam; common, fine, distinct, yellowish-brown (10YR 5/4) and light olive-brown (2.5Y 5/4) mottles; moderate, medium, subangular blocky structure; very firm, compact, slightly sticky; few roots; few, small, round, hard, brown concretions; very strongly acid; gradual, smooth boundary.

B′x2g—28 to 40 inches, gray (N 5/0) heavy silty clay loam; common, fine, distinct, yellowish-brown (10YR 5/6) and light olive-brown (2.5Y 5/4) mottles; moderate, medium, subangular blocky structure; very firm, compact, slightly sticky; common clay films; common, small, round, hard, brown concretions; very strongly acid; gradual, wavy boundary.

Cg—40 to 54 inches +, light-gray (N 7/0) silty clay; common, medium and fine, distinct, yellowish-brown (10YR 5/6) mottles; massive; very firm; few, small, round, soft, brown concretions; very strongly acid.

The color of the Ap horizon ranges from 2.5Y to 10YR in hue, from 4 to 5 in value, and from 2 to 3 in chroma. In some profiles the Ap horizon has light-gray and yellowish-brown mottles.

In unplowed areas, there is a thin A1 horizon of grayish-brown to dark grayish-brown silt loam. Where present, the A2 horizon is 10YR to 2.5Y in hue, 5 to 6 in value, and 2 to 4 in chroma.

The matrix color of the B2g horizon is 5Y to 2.5Y in hue, 5 to 6 in value, and 1 to 2 in chroma.

In color the Cg horizon is dominantly yellowish brown (10YR 5/4) in some profiles, and in texture it ranges from silty clay to silty clay loam.

The solum is about 35 to 48 inches thick. The depth to the fragipan is about 12 to 20 inches, and the depth to bedrock is 5 to 12 feet. The fragipan ranges from about 18 to 36 inches in thickness.

Robertsville soils are more gray, more mottled nearer the surface, and more poorly drained than Lawrence and Bedford soils. They are shallower to the fragipan than Bedford soils.

Robertsville silt loam (0 to 2 percent slopes) (Rb).—This soil occurs on stream terraces and in flats and depressions on the upland. It is wet most of the time because permeability is slow and the water table is seasonally high. Water stands on the surface layer for several days after heavy rainfall. Some areas are flooded infrequently.

This soil is poorly suited to cultivated crops. Bed-furrowing (fig. 16) makes it possible to grow some crops. Tile drainage generally is not feasible, because the slowly permeable fragipan is so near the surface, but open ditches can be used to remove surface water and improve drainage. (Capability unit IVw–1; woodland group 4)

Rockcastle Series

The Rockcastle series consists of excessively drained soils that have a clayey subsoil. These soils are shallow to moderately deep over shale bedrock. They developed in residuum weathered from soft, gray, acid shale.

In a representative profile in an area that is uneroded, the surface layer is grayish-brown silt loam about 3 inches thick. The subsurface layer, about 4 inches thick, is light olive-brown silt loam. The subsoil is olive-gray, variegated silty clay about 8 inches thick. Below this is gray clay, and at a depth of about 24 inches is acid shale.

The natural fertility of these soils is low, and the reaction is very strongly acid. Permeability is slow, and the available moisture capacity is low.

Soils of the Rockcastle series occur in the southern and western parts of Nelson County. Most of the acreage is wooded, mainly with oak and hickory. A small part of the cleared acreage is used for pasture, and the rest is in brush.

Representative profile of Rockcastle silt loam, 12 to 20 percent slopes:

O1—¼ inch to 0, partly decayed leaves and twigs.

A1—0 to 3 inches, grayish-brown (2.5Y 5/2) silt loam; weak to moderate, fine, granular structure; very friable; abundant roots; 2 percent shale fragments; very strongly acid; clear, smooth boundary.

A2—3 to 7 inches, light olive-brown (2.5Y 5/4) heavy silt loam; weak, fine and medium, subangular blocky structure; friable; common roots; very strongly acid; 2 percent shale fragments; clear, smooth boundary.

B—7 to 15 inches, olive-gray (5Y 5/2) silty clay; common, medium, faint variegations of light olive brown (2.5Y 5/4) and common, medium, distinct variegations of light brownish gray (2.5Y 6/2); weak, medium and coarse, angular blocky structure; common roots; very firm; very

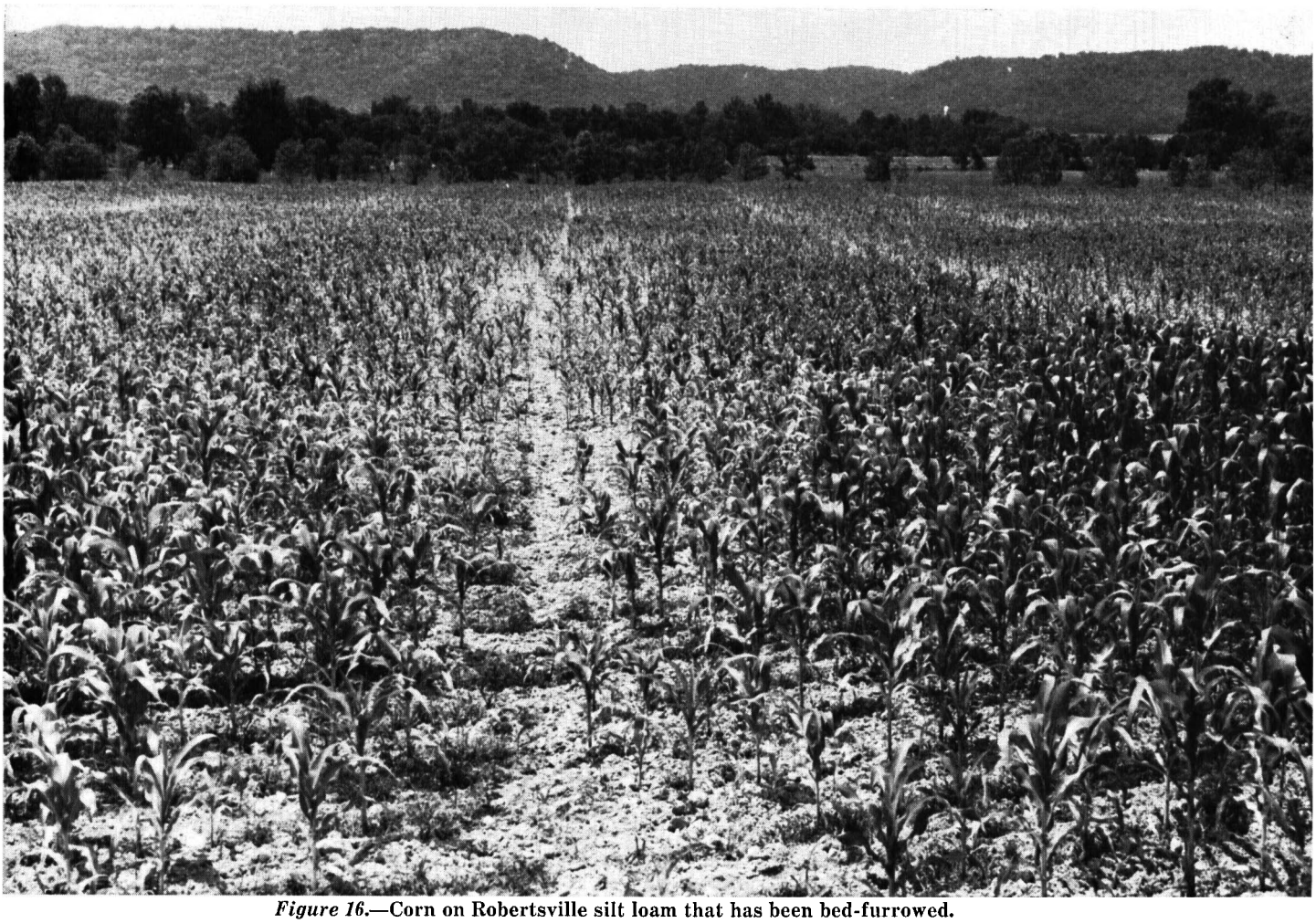

Figure 16.—**Corn on Robertsville silt loam that has been bed-furrowed.**

strongly acid; 12 percent shale fragments; gradual, smooth boundary.

C—15 to 24 inches, gray (5Y 5/1) clay; many, medium, distinct, olive (5Y 5/4) mottles; very firm; massive; 20 percent shale fragments; very strongly acid.

R—24 inches +, gray clay acid shales of the New Providence Formation.

In a few places a thin mantle of loess caps the profile. In some places 3 to 6 inches of cherty silt loam occur at the surface, and in other places 3 to 10 percent of the surface layer consists of thin slabs of limestone.

The Ap horizon in severely eroded places is grayish-brown shaly silty clay. The A2 horizon in some profiles is brown (10YR 5/3). The A and B horizons commonly contain less than 15 percent shale fragments except in severely eroded areas where the percentage on the surface and in the Ap horizon ranges from about 15 to 30 percent. In a few places the B horizon is silty clay loam. The low chroma of the B horizon is believed to be inherited from the parent material and not to be caused by impeded drainage.

The solum is about 10 to 18 inches thick. The depth to shale is 16 to 26 inches.

Rockcastle soils are associated with Colyer and Weikert soils. They differ from those soils in having a less brown, more gray, and more clayey subsoil.

Rockcastle silt loam, 12 to 20 percent slopes (RcD).—This soil occurs on and near ridgetops. It has convex slopes. It has the profile described as representative for the series. Included in mapping were small acreages of soils that have a thin, yellowish-red subsoil and of soils that have slopes of less than 12 percent.

The organic-matter content is low. The root zone is shallow.

This soil is better suited to pasture, woodland, and wildlife habitat than to cultivated crops because of droughtiness, shallowness, and an erosion hazard. (Capability unit VIs–3; woodland group 9)

Rockcastle silt loam, 20 to 50 percent slopes (RcF).—This soil has convex slopes that are commonly dissected by deep drainageways. Included in mapping were a small acreage of Weikert soils and a few areas of moderately eroded soils.

This soil is unsuited to cultivated crops because of a shallow root zone, steep slopes, and an erosion hazard. It is poorly suited to pasture and can be grazed to only a limited extent. Better uses are woodland and wildlife habitat. (Capability unit VIIs–1; woodland group 9)

Rockcastle shaly silty clay, 12 to 30 percent slopes, severely eroded (RkE3).—This soil is on ridgetops and hillsides. It has convex slopes. As a result of erosion, the plow layer consists mostly of the clayey subsoil. Shallow gullies are common. Included in mapping were a few small areas of shale outcrop.

The plow layer is difficult to till because the organic-matter content is very low and the texture is silty clay. The root zone is very shallow.

This soil is unsuited to row crops because of the effects of erosion, the hazard of further erosion, and the shallow root zone. It is very poorly suited to any use other than woodland and wildlife habitat. Grasses and legumes are very difficult to establish and maintain. (Capability unit VIIs–3; woodland group 8)

Rockcastle-Weikert complex, 20 to 50 percent slopes (RlF).—This complex is about 36 percent Weikert shaly silt loam and about 52 percent Rockcastle silt loam. Weikert shaly silt loam is upslope from Rockcastle silt loam. The slopes are concave and are commonly dissected by deep drainageways. Included in mapping were small acreages of Trappist and Colyer soils, some areas of soils that have a fine sandy loam texture throughout, and a few small areas of sandstone outcrop and cherty rubble land.

The Weikert soil in this complex has a profile like the one described under the heading "Weikert Series."

These soils are unsuited to cultivation because of a shallow root zone, droughtiness, and steep slopes. They are poorly suited to pasture and can be grazed to only a very limited extent. Unless cover is maintained, the hazard of erosion is very severe. Woodland and wildlife habitat are suitable uses. (Capability unit VIIs–1; woodland group 9)

Rock Land-Corydon Complex

Rock land-Corydon complex (Ro) is about 55 percent Rock land and about 42 percent Corydon silt loam. It occurs as long, somewhat narrow strips on valley walls, mostly below areas of Pembroke and Corydon soils. The slope range is 12 to 30 percent. Included in mapping were small acreages of Beasley, Faywood, and Hagerstown soils; areas of a soil similar to the Fairmount soils; and outcrops of acid shale.

Rock land consists of rock outcrop and less than 6 inches of dark-colored silty clay loam material over bedrock. The rocks are commonly in the form of ledges or cliffs, and some soil material occurs in crevices and between the ledges.

The Corydon soil in this complex is a few inches shallower to bedrock than the Corydon soil that has the profile representative of the series. The areas of soil between the rock outcrops range from a few square feet to half an acre in size.

Permeability is moderate to moderately slow, and the available moisture capacity is moderate to low. The plow layer is medium in organic-matter content, except in places where erosion has exposed the clayey subsoil. The root zone is very shallow to moderately deep.

This complex is unsuited to uses other than woodland and wildlife habitat because of the rock outcrops, the steep slopes, the limited root zone, and droughtiness. (Capability unit VIIs–5. Rock land: woodland group 11, Corydon: woodland group 7)

Russellville Series

The Russellville series consists of well drained to moderately well drained, loamy soils that contain a fragipan. These soils developed on uplands in loess deposited over residuum weathered from limestone.

In a representative profile, the plow layer is brown silt loam about 7 inches thick. The subsoil, to a depth of 56 inches or more, is silty clay loam. It is brown to strong brown in the upper 17 inches, yellowish brown to strong brown in the fragipan, and strong brown below a depth of about 43 inches.

The natural fertility of these soils is moderate, and the organic-matter content is medium. Permeability is moderate above the pan and slow in the pan. The available moisture capacity is moderate. The plow layer is easy to till and can be worked throughout a wide range in moisture content without clodding or crusting. The root zone is moderately deep.

Russellville soils occur in an area that extends from Bardstown southeast to Botland and northwest to the county line. They also occur to a limited extent in the southern part of Nelson County. Nearly all the acreage is cleared and is used for row crops, hay, and pasture.

Representative profile of Russellville silt loam, 2 to 6 percent slopes:

Ap—0 to 7 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; many roots; moderately alkaline; clear, smooth boundary.

B1t—7 to 11 inches, brown (7.5YR 4/4) silty clay loam (less than 35 percent clay); weak, medium, subangular blocky structure; friable; few worm casts; common roots; few clay films; moderately alkaline; gradual, smooth boundary.

B2t—11 to 24 inches, strong-brown (7.5YR 5/6) silty clay loam (less than 35 percent clay); moderate, medium, subangular blocky structure; firm, slightly sticky; common roots; common clay films; few, small, round, hard, dark-brown concretions; strongly acid; clear, smooth boundary.

Bx1—24 to 35 inches, yellowish-brown (10YR 5/4) silty clay loam (less than 35 percent clay); many, medium, light-gray (10YR 7/2) mottles; moderate, medium, angular blocky structure to thick, platy structure; firm, compact; common clay films; common brown and black concretions and black coatings on peds; strongly acid; gradual, smooth boundary.

Bx2—35 to 43 inches, strong-brown (7.5YR 5/6) silty clay loam (less than 35 percent clay); many, coarse, distinct, pale-brown (10YR 6/3) and common, fine, distinct, light-gray (10YR 7/2) mottles; moderate, medium, subangular and angular blocky structure; firm, compact; common, small, round, hard, black concretions; strongly acid; gradual, smooth boundary.

IIB3t—43 to 56 inches +, strong-brown (7.5YR 5/6) silty clay loam; many, medium, distinct, pale-brown (10YR 6/3) mottles; weak, coarse, angular blocky structure; firm, slightly sticky; common black concretions; very strongly acid.

The color of the Ap horizon has a value of 3 in a few profiles. The color of the B2t horizon is 4 in both value and chroma in a few places, and in some places the color of the lower part is 10YR in hue. The matrix color of the Bx horizon is 2.5Y in hue in some profiles. The Bx horizon in some profiles is thinner and less compact than that in the representative profile.

The IIB3t horizon is yellowish brown in some profiles, and in others it is yellowish red. The texture is silty clay loam to silty clay.

The solum is about 48 to 65 inches thick. The depth to bedrock is 6 to 12 feet. The reaction is strongly acid to very strongly acid throughout the profile, except where lime has been applied.

Russellville soils are associated with Pembroke, Hagerstown, and Bedford soils. Russellville soils differ from Hagerstown and Pembroke soils in having a less red subsoil and in having a fragipan. They are less clayey

than Hagerstown soils. Russellville soils have a more brown and less yellow upper subsoil than Bedford soils and a less gray and less compact pan.

Russellville silt loam, 0 to 2 percent slopes (RuA).—This soil occurs on broad uplands. It has straight to slightly convex slopes. Included in mapping were small acreages of Bedford and Pembroke soils.

This soil is suited to all the commonly grown crops. (Capability unit I–3; woodland group 5)

Russellville silt loam, 2 to 6 percent sopes (RuB).—This soil occurs on broad uplands. It has the profile described as representative for the series. The slopes are convex. Included in mapping were small acreages of Bedford and Pembroke soils, of moderately eroded soils, and of soils that have slopes of more than 6 percent.

This soil is suited to all of the commonly grown crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–10; woodland group 5)

Shelbyville Series

The Shelbyville series consists of deep, well-drained soils on uplands. These soils developed in a thin layer of loess deposited over residuum weathered from thin-bedded limestone.

In a representative profile, the plow layer is dark-brown silt loam about 8 inches thick. The subsoil is about 30 inches thick. The uppermost 6 inches is brown silt loam, the next 17 inches is brown to strong-brown silty clay loam, and the rest is strong-brown silty clay. At a depth of about 38 inches is yellowish-brown clay.

The natural fertility of these soils is high, and the organic-matter content is medium. Permeability is moderate in the upper 30 inches of the profile and moderately slow below that depth. The available moisture capacity is high. The plow layer is easy to till, and it can be tilled throughout a fairly wide range in moisture content without clodding or crusting. The root zone is deep.

Soils of the Shelbyville series occur in the north-central part of Nelson County. Nearly all the acreage is cleared and is used for row crops, hay, and pasture.

Representative profile of Shelbyville silt loam, 2 to 6 percent slopes:

Ap—0 to 8 inches, dark-brown (10YR 3/3) silt loam; weak, fine, granular structure; very friable; abundant roots; neutral; clear, smooth boundary.

B1—8 to 14 inches, brown (7.5YR 4/4) silt loam; weak, fine, subangular blocky structure; friable; common roots; slightly acid; clear, smooth boundary.

B21t—14 to 20 inches, brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; firm, slightly sticky; few clay films; medium acid; clear, smooth boundary.

B22t—20 to 31 inches, strong-brown (7.5YR 5/6) silty clay loam; moderate, medium and fine, angular blocky structure; firm, slightly sticky; common roots; common clay films; few, small, round, soft, black concretions; strongly acid; gradual, smooth boundary.

IIB3tcn—31 to 38 inches, strong-brown (7.5YR 5/6) silty clay; many, medium, faint, yellowish-brown (10YR 5/6) and few, fine, distinct, light brownish-gray (2.5Y 6/2) variegations; moderate, fine, angular blocky structure; very firm; abundant, small, round, soft, black concretions and irregularly shaped, black concretionary material; few clay films; slightly acid; gradual, smooth boundary.

IIC—38 to 52 inches +, yellowish-brown (10YR 5/6) clay; common, fine, distinct variegations of light brownish gray (2.5Y 6/2); massive; extremely firm, sticky; common, small, round, soft, black concretions and irregularly shaped concretionary material; slightly acid.

The color of the Ap horizon ranges from 10YR to 7.5YR in hue and from 2 to 3 in chroma.

The B1 horizon in a few profiles is light silty clay loam. The color of the B2 horizon ranges from 4 to 5 in value and from 4 to 6 in chroma. In a few places the lower part of the B22 horizon contains a few light-gray (10YR 7/2) mottles. The color of the IIB3tcn horizon ranges from 10YR to 7.5YR in hue, from 4 to 5 in value, and from 4 to 6 in chroma. The concretions in the B3tcn horizon are less abundant in some profiles than in the profile described. The depth to silty clay ranges from about 24 to 34 inches.

The C horizon is olive brown (2.5Y 4/4) in a few profiles, and in others it is strong brown (7.5YR 5/6).

The solum is about 34 to 45 inches thick. The depth to limestone bedrock is about 5 to 10 feet. The reaction ranges from slightly acid to strongly acid.

Shelbyville soils are associated with Nicholson, Lowell, and Fairmount soils. Shelbyville soils lack the fragipan that is characteristic of Nicholson soils, and they have a browner and less clayey subsoil than Lowell soils. Shelbyville soils have a coarser textured surface layer and a browner, thicker, and less clayey subsoil than Fairmount soils, and they are deeper to bedrock.

Shelbyville silt loam, 2 to 6 percent slopes (ShB).—This soil occurs on ridgetops. It has convex slopes. Included in mapping were small areas of Lowell and Nicholson soils, of soils that have a lighter colored plow layer and a yellowish-brown subsoil, of soils that are moderately eroded, of soils that have more than 6 percent slopes, and of soils that have less than 2 percent slopes.

This soil is suited to all of the commonly grown crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–1; woodland group 1)

Shrouts Series

The Shrouts series consists of somewhat excessively drained, clayey soils that are shallow to moderately deep over bedrock. These soils are on uplands. They developed in residuum weathered from calcareous shale and soft limestone.

In a representative profile, the 6-inch plow layer consists of dark-gray silty clay over grayish-brown clay. The subsoil, about 8 inches thick, is yellowish-brown clay. Below this is dark grayish-brown to slightly purple clay about 12 inches thick. It is underlain by greenish-gray clay shale.

The natural fertility of these soils is low, and the organic-matter content is low. Permeability is moderately slow, and the available moisture capacity is low. The root zone is shallow.

Soils of the Shrouts series occur in an area that extends from Bardstown southeast and northwest to the county line. They also occur to a limited extent in the southern and western parts of Nelson County. About a third of the acreage is pasture. Some of the rest is idle land, and some is woodland. The woodland stands consist mainly of young redcedar. The calcareous shale is a source of lime.

Representative profile of Shrouts silty clay, 6 to 12 percent slopes:

Ap1—0 to 3 inches, dark-gray (10YR 4/1) silty clay; moderate, fine, granular microstructure and weak, fine, angu-

lar blocky macrostructure; firm when moist, sticky when wet; abundant roots; moderately alkaline; abrupt, smooth boundary.

Ap2—3 to 6 inches, grayish-brown (10YR 5/2) clay; common, fine, distinct, light brownish-gray (2.5Y 6/2) and yellowish-brown (10YR 5/4) mottles; strong, medium and fine, angular blocky structure; very firm when moist, sticky when wet; abundant organic stains on ped faces; common roots; few small lime nodules; moderately alkaline; clear, smooth boundary.

Bt—6 to 14 inches, yellowish-brown (10YR 5/4) clay; common, fine, distinct, olive-gray (5Y 5/2) and grayish-brown (2.5Y 5/2) mottles; strong, fine and medium, angular blocky structure; very firm when moist, sticky when wet; common roots; weak clay films; few lime nodules; moderately alkaline and calcareous; clear, smooth boundary.

C—14 to 26 inches, dark grayish-brown (10YR 4/2) to slightly purple clay; many pieces of soft, brownish-yellow (10YR 6/6) sandstone; weak, coarse, angular blocky structure to structureless (massive); very firm when moist, sticky when wet; common yellowish-brown (10YR 5/4) and few greenish-gray (5GY 5/1) variegations; few roots; moderately alkaline and calcareous; gradual, wavy boundary.

R—26 to 34 inches +, greenish-gray (5GY 6/1), calcareous clay shale; few streaks of white (5Y 8/1) and olive (5Y 5/4).

The Ap1 horizon in some profiles is very dark grayish brown (10YR 3/2). It is from 0 to 5 inches thick. The Ap2 horizon in some profiles is light yellowish brown (2.5Y 6/4). The entire Ap horizon in many profiles is grayish brown (10YR 5/2) or light yellowish brown (2.5Y 6/4), and it ranges in texture from silty clay loam to clay.

Other colors of the B and C horizons are light olive brown (2.5Y 5/4) and greenish gray (5GY 6/1). The texture of these horizons in some profiles is silty clay loam.

The solum is about 10 to 18 inches thick. The depth to shale is 14 to 40 inches. All horizons in some profiles are calcareous.

Shrouts soils are associated with Otway, Beasley, and Corydon soils. Shrouts soils differ from Otway soils in having a lighter colored and more clayey surface layer. They have a thinner, finer textured surface layer and a thinner, less red subsoil than Beasley soils. Shrouts soils have more lime than Corydon soils, and they lack the red subsoil and the hard limestone bedrock that is characteristic of Corydon soils.

In this county Shrouts soils are mapped in complexes with Otway soils.

Shrouts-Otway complex, 6 to 12 percent slopes (SoC).—This complex is about 55 percent Shrouts silty clay and about 30 percent Otway silty clay loam. The profiles are those described as representative of the respective series. The complex occurs as narrow bands on valley walls. The slopes are concave. Included in mapping were a very small acreage of Beasley soils and small areas that consist mostly of shallow gullies and exposed calcareous shale.

These shallow and droughty soils are limited mainly by the effects of erosion and the hazard of further erosion. They are suited to pasture, woodland, and wildlife habitat. (Capability unit VIs–3; woodland group 8)

Shrouts-Otway complex, 12 to 30 percent slopes (SoE).—This complex is about 60 percent Shrouts silty clay and about 25 percent Otway silty clay loam. It occurs as narrow bands on valley walls. It has concave slopes. Included in mapping were a very small acreage of Beasley soils and small areas that consist of shallow gullies and exposed calcareous shale.

These shallow and droughty soils are very severely limited, mainly by the effects of erosion and the hazard of further erosion. They are suited to woodland and to wildlife habitat and can be used to a limited extent for grazing. (Capability unit VIIs–3; woodland group 8)

Tilsit Series

The Tilsit series consists of moderately well drained, loamy soils that have a fragipan. These soils developed in loess deposited over residuum weathered from acid shale.

In a representative profile, the plow layer is grayish-brown silt loam about 8 inches thick. The subsoil is yellowish-brown silt loam to a depth of about 25 inches. Below this is a mottled silty clay loam fragipan 9 inches thick. The underlying material is gray silty clay. At a depth of about 40 inches is shale.

The organic-matter content is low, and the reaction is very strongly acid. Permeability is moderate above the fragipan and slow in the fragipan. The available moisture capacity is moderate. The plow layer is easy to till, and it can be tilled throughout a fairly wide range in moisture content without clodding or crusting. The root zone is moderately deep to the fragipan.

Soils of the Tilsit series occur on uplands in the southern and western parts of Nelson County. Approximately three-fourths of the acreage is cleared and used for row crops, hay, and pasture. Some of the acreage is idle, and some is wooded, mainly with oak, hickory, and Virginia pine.

Representative profile of Tilsit silt loam, 2 to 6 percent slopes:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; friable; common roots; strongly acid; clear, smooth boundary.

B1—8 to 13 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium, subangular blocky structure; friable; common roots; strongly acid; clear, smooth boundary.

B2t—13 to 25 inches, yellowish-brown (10YR 5/6) heavy silt loam; few, fine, faint, pale-brown (10YR 6/3) mottles; weak to moderate, medium, subangular blocky structure; firm; common roots; few clay films; few, fine, reddish-brown, weathered shale fragments; strongly acid; clear, smooth boundary.

Bx—25 to 34 inches, mottled light-gray (5Y 7/1) and 2.5Y 7/2), brownish-yellow (10YR 6/8), and strong-brown (7.5YR 5/6) silty clay loam; weak, fine and medium, angular blocky structure; very firm, compact; few clay films; few small rock fragments that resemble petrified wood; very strongly acid; gradual, wavy boundary.

IIC—34 to 40 inches, gray (5Y 6/1) silty clay; common, distinct mottles of yellowish-brown (10YR 5/6); structureless (massive); very firm; many weathered shale fragments; very strongly acid; gradual, smooth boundary.

IIR—40 inches +, gray, strong-brown, dark-brown, reddish-brown, and black, slightly weathered Devonian shale.

The Ap horizon in some profiles is brown (10YR 4/3 or 10YR 5/3). In unplowed areas there is a thin, dark grayish-brown (10YR 4/2) A1 horizon and a brown (10YR 5/3) A2 horizon.

Some profiles lack a B1 horizon. In a few profiles the B2t horizon is dark yellowish-brown (10YR 4/4), and in some it is light silty clay loam in texture. The Bx horizon is about 6 to 15 inches thick.

The IIC horizon is silty clay loam in some profiles, and in a few places it contains sandstone fragments.

The solum is about 30 to 40 inches thick. The depth to bedrock is about 3 to 5 feet. In a few places the bedrock is brown sandstone. The reaction is strongly acid to very strongly acid throughout the profile.

Tilsit soils are associated with Trappist, Lawrence, and Zanesville soils. They are better drained and have fewer mottles in the upper part of the subsoil than Lawrence soils. Tilsit soils have more yellow in the upper part of the subsoil than Zanesville soils and are a few inches shallower over the fragipan and are somewhat less well drained than those soils. They have a more yellow and less red clayey subsoil than Trappist soils, and they contain a fragipan.

Tilsit silt loam, 2 to 6 percent slopes (TlB).—This soil occurs on moderately broad ridges. It has convex slopes. It has the profile described as representative for the series. Included in mapping were a small acreage of Lawrence soils, a few areas of soils that are moderately eroded, and some areas of soils that have slopes of 0 to 2 percent.

This soil is moderate in natural fertility. It is saturated to within 18 to 24 inches of the surface layer for several days after heavy rainfall, and it is slow to dry out and warm up because of the slowly permeable fragipan.

This soil is well suited to most of the commonly grown crops except alfalfa. Alfalfa dies after 2 to 3 years because of the limited root zone and the wetness. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–6; woodland group 5)

Tilsit silt loam, 6 to 12 percent slopes, eroded (TlC2).—This soil occurs on ridges and has convex slopes. It has a lighter colored plow layer than the soil that has the representative profile. As a result of erosion, the plow layer is partly subsoil and a few shallow gullies have formed.

Included in mapping were a few areas in which the subsoil is olive-brown, mottled silty clay loam to a depth of about 24 inches and clayey below that depth. Also included were a small acreage of Trappist soils, a few areas of uneroded soils, and a few of severely eroded soils.

This soil is moderately low in natural fertility. It is saturated for a few days after heavy rainfall, and it is wet late in spring because of the slowly permeable fragipan.

This soil is well suited to most of the commonly grown crops except alfalfa. Alfalfa dies after 3 years because of the limited root zone and the excessive wetness. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–8; woodland group 5)

Trappist Series

The Trappist series consists of well-drained, moderately deep soils that developed in residuum. Most of the residuum weathered from black, fissile, acid shale, but some weathered from gray shale and sandstone. In many places a thin layer of loess deposited over the residuum has had an influence.

In a representative profile, the surface layer is dark-brown to brown silt loam about 7 inches thick. The subsoil is about 31 inches thick. It is brown, friable silt loam in the upper part, yellowish-red silty clay loam in the middle part, and strong-brown, very firm silty clay loam in the lower part. The substratum is brown silty clay that has yellowish-red, strong-brown, and gray variegations and contains many small shale fragments. Below this, at a depth of about 37 inches, is slightly weathered, dark reddish-gray shale that contains thin lenses of gray clay.

The reaction is very strongly acid. Permeability is moderately slow, and the available moisture capacity is moderate.

Soils of the Trappist series occur on uplands in the southern and western parts of Nelson County. Approximately two-thirds of the acreage has been cleared. The rest is wooded, mainly with oak and hickory. The cleared acreage is used mainly for pasture, hay, and row crops, but some is reverting to woodland. Brush and young Virginia pine are common.

Representative profile of Trappist silt loam, 6 to 12 percent slopes:

O1—1 inch to 0, partly decayed leaves and twigs.

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

A2—1 to 7 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable when moist; abundant roots; very strongly acid; clear, smooth boundary.

B1t—7 to 10 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable when moist; abundant roots; very strongly acid; gradual, smooth boundary.

B2t—10 to 21 inches, yellowish-red (5YR 4/6) silty clay loam (more than 35 percent clay); moderate, medium, angular blocky structure; very firm when moist, sticky when wet; common roots; common clay films; few small fragments of reddish-brown (5YR 4/4) shale; very strongly acid; gradual, smooth boundary.

B3—21 to 31 inches, strong-brown (7.5YR 5/6) silty clay loam; weak, medium, angular blocky structure; common, medium, yellowish-red (5YR 5/6) and few, fine, faint, pinkish-gray (7.5YR 6/2) variegations; very firm when moist, sticky when wet; few roots; common small fragments of brown (7.5YR 4/4) shale; very strongly acid; gradual, smooth boundary.

C—31 to 37 inches, brown (7.5YR 5/4) light silty clay; many yellowish-red (5YR 5/6) and strong-brown (7.5YR 5/6) variegations and few, fine, distinct, gray (10YR 6/1) variegations; relict platy structure; very firm when moist, sticky when wet; few roots; abundant, small, fragments of yellowish-red (5YR 5/6) and reddish-brown (5YR 4/4) shale; very strongly acid; gradual, wavy boundary.

R—37 to 44 inches +, slightly weathered, fissile, acid Devonian shale; exterior is dark reddish-gray (5YR 4/2) and interior along a freshly broken surface is dark red (2.5YR 3/6), dark reddish brown (5YR 3/3), or dark brown (7.5YR 4/4); few thin layers of light-gray (10YR 6/1) clay between the layers of shale.

In plowed places there is an Ap horizon (10YR 4/3 to 5/3) or yellowish-brown (10YR 5/4) silt loam. In severely eroded places, the Ap horizon is commonly brown (7.5YR 5/4) silty clay loam. In a few profiles the A horizon and the upper part of the B horizon have a chert content of as much as 10 percent.

The color of the B horizon is 10YR, 7.5YR, and 5YR in hue, 4 to 5 in value, and 3 to 6 in chroma. In texture the B2t horizon is silty clay in a few profiles. The B3 horizon contains some red (2.5YR 4/6) and light brownish-gray (2.5Y 6/2) variegations.

The dominant colors of the C horizon include yellowish red, strong brown, and gray. The C horizon in some profiles contains fine sandstone fragments. The coarse-fragment content of the C horizon is about 25 to 50 percent. The R horizon is sandstone in some profiles.

The solum generally is about 20 to 36 inches thick. The depth to bedrock is about 26 to 40 inches.

Trappist soils are associated with Tilsit, Whitley, and Colyer soils. Trappist soils have a redder and more clayey subsoil than Tilsit soils. They are better drained than Tilsit soils, which have a fragipan. Trappist soils have

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a more clayey subsoil and are less deep to bedrock than Whitley soils. They have a thicker and more clayey subsoil than Colyer soils, and they are deeper to bedrock.

Trappist silt loam, 2 to 6 percent slopes (TpB).—This soil occurs on moderately broad ridges. It has convex slopes. Included in mapping were small areas of soils that have a plow layer of brown silt loam, a subsoil of yellowish-brown light silty clay loam, and a few fragments of sandstone or chert or both throughout the profile. Also included were small areas of Tilsit soils.

The natural fertility of this soil is moderate, and the organic-matter content is medium. The plow layer is easy to till and can be worked throughout a wide range of moisture content without clodding or crusting.

This soil is suited to most of the commonly grown crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–9; woodland group 2)

Trappist silt loam, 2 to 6 percent slopes, eroded (TpB2).—This soil occurs on narrow to moderately broad ridges. It has convex slopes. It is lighter colored in the plow layer and less deep to bedrock than the soil that has the representative profile. Included in mapping were small areas of soils that have a plow layer of brown silt loam, a subsoil of yellowish-brown silty clay loam, and a few fragments of sandstone or chert or both throughout the profile. Also included were small areas of Tilsit soils.

The natural fertility of this soil is moderate, and the organic-matter content is low. The plow layer is easy to till and can be worked throughout a fairly wide range of moisture content without clodding or crusting. The root zone is moderately deep.

This soil is suited to most of the commonly grown crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–9; woodland group 2)

Trappist silt loam, 6 to 12 percent slopes (TpC).—This soil occurs on and near ridgetops, on knolls, and on the lower part of hillsides. It has the profile described as representative for the series. The slopes are slightly convex. Included in mapping were small areas of soils that have a plow layer of brown silt loam, a subsoil of yellowish-brown light silty clay loam, and a few fragments of sandstone or chert or both throughout the profile.

The natural fertility of this soil is moderate, and the organic-matter content is low. The plow layer is easy to till and can be worked throughout a fairly wide range in moisture content without clodding or crusting. The root zone is deep.

This soil is suited to most of the commonly grown crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–7; woodland group 2)

Trappist silt loam, 6 to 12 percent slopes, eroded (TpC2).—This soil occurs on and near ridgetops, on knolls, and on the lower part of hillsides. It has slightly convex slopes. It has a lighter colored plow layer and is less deep to bedrock than the soil that has the representative profile. As a result of erosion, the plow layer is partly subsoil. Included in mapping were small areas of a soil that has a plow layer of brown silt loam, a subsoil of yellowish-brown light silty clay loam, and a few fragments of sandstone or chert or both throughout the profile.

The natural fertility of this soil is moderate, and the organic-matter content is low. The plow layer is easy to work and can be worked throughout a fairly wide range of moisture content without clodding or crusting. The root zone is moderately deep.

This soil is suited to most of the commonly grown crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–7; woodland group 2)

Trappist silt loam, 12 to 20 percent slopes (TpD).—This soil occurs on hillsides and knolls. It has slightly convex slopes. Included in mapping were small areas of Colyer soils, of soils that are 20 to 26 inches deep to bedrock, and of moderately eroded soils.

The natural fertility of this soil is moderate, and the organic-matter content is medium. The plow layer is easy to till and can be tilled throughout a fairly wide range of moisture content without clodding or crusting. The root zone is deep.

This soil is suited to only occasional cultivation because the erosion hazard is very severe. Most of the common crops can be grown, but pasture and hay are better uses. Most grasses and legumes can be grown. (Capability unit IVe–3; woodland group 2)

Trappist silt loam, 12 to 20 percent slopes, eroded (TpD2).—This soil occurs on hillsides and knolls. It has slightly convex slopes. It has a lighter colored plow layer and is less deep to bedrock than the soil that has the representative profile. As a result of erosion, the plow layer is partly subsoil. Included in mapping were small areas of Colyer soils and of severely eroded soils that have a silty clay loam plow layer.

The natural fertility of this soil is moderate, and the organic-matter content is low. The plow layer is easy to till and can be worked throughout a fairly wide range of moisture content without clodding or crusting. The root zone is moderately deep.

This soil is suited to only occasional cultivation, because the erosion hazard is very severe. Most of the common crops can be grown, but pasture and hay are better uses. (Capability unit IVe–3; woodland group 2)

Trappist silty clay loam, 6 to 12 percent slopes, severely eroded (TrC3).—This soil occurs on and near ridgetops, on knolls, and at the foot of steep hillsides. It has slightly convex slopes. It is less deep to bedrock than the soil that has the representative profile. As a result of erosion, the plow layer is mostly clayey subsoil. Shallow gullies are common. Included in mapping were a few small areas of Gullied land, acid shaly materials.

The natural fertility of this soil is low, and the organic-matter content is very low. Tillage is somewhat difficult because of the silty clay loam texture. The plow layer can be tilled only within a somewhat narrow range of moisture content without clodding or crusting. The root zone is moderately deep.

This soil is suited to only occasional cultivation, because the erosion hazard is very severe. Most of the common crops can be grown, but pasture and hay are better uses. (Capability unit IVe–11; woodland group 3)

Trappist silty clay loam, 12 to 20 percent slopes, severely eroded (TrD3).—This soil occurs on and near ridgetops, on knolls, and at the foot of steep hillsides.

It has slightly convex slopes. It has a redder, finer textured plow layer and is less deep to bedrock than the soil that has the representative profile. As a result of past erosion, the plow layer is mostly clayey subsoil. Shallow gullies are common. Included in mapping were a few small areas of Gullied land, acid shaly materials.

The natural fertility of this soil is low, and the organic-matter content is very low. Tillage is somewhat difficult because of the silty clay loam texture. The plow layer can be tilled only within a somewhat narrow range of moisture content without clodding or crusting. The root zone is moderately deep.

This soil is not suited to cultivated crops because of the effects of erosion and the hazard of further erosion. It is suited to pasture and hay, but grasses and legumes are difficult to establish and maintain. Other suitable uses are woodland and wildlife habitat. (Capability unit VIe–2; woodland group 3)

Trimble Series

The Trimble series consists of well-drained, cherty and gravelly soils. These soils developed in fairly old alluvium and colluvium derived from soils underlain by cherty limestone.

In a representative profile, the plow layer is brown cherty silt loam about 6 inches thick. The subsoil, to a depth of 60 inches or more, is strong-brown cherty silty clay loam.

Permeability is moderate. The plow layer is somewhat difficult to till because of the chert. The reaction is very strongly acid.

Soils of the Trimble series occur on stream terraces and foot slopes in the southern and western parts of Nelson County. Approximately 40 percent of the acreage is wooded, mainly with oak, hickory, and yellow-poplar. The cleared acreage is used mostly for hay and pasture. A small acreage is used for row crops, and scattered areas are idle.

Representative profile of Trimble cherty silt loam, 6 to 12 percent slopes:

Ap—0 to 6 inches, brown (10YR 5/3) cherty silt loam (18 percent chert); weak, fine, granular structure; friable when moist; mildly alkaline; clear, smooth boundary.

B1t—6 to 10 inches, yellowish-brown (10YR 5/6) cherty silty clay loam (18 percent chert); weak, medium and fine, subangular blocky structure; friable when moist, slightly sticky when wet; common roots; few thin clay films on peds; few worm casts; very strongly acid; clear, smooth boundary.

B21t—10 to 17 inches, strong-brown (7.5YR 5/6) cherty silty clay loam (23 percent chert); weak, medium, subangular blocky structure; firm when moist, slightly sticky when wet; common roots; few thin clay films on peds; few silt coatings on ped faces; very strongly acid; clear, smooth boundary.

B22t—17 to 27 inches, strong-brown (7.5YR 5/6 to 5/8) cherty silty clay loam (15 percent chert); moderate, medium, angular blocky structure; very firm when moist; common clay films; few light-gray (10YR 7/2) silt coatings; very strongly acid; clear, smooth boundary.

B23t—27 to 68 inches, strong-brown (7.5YR 5/8) cherty silty clay loam (28 percent chert); common, medium, distinct, light-gray (2.5Y 7/2) mottles and silt coatings; common, medium, distinct, brownish-yellow to yellowish-brown (10YR 6/6 to 5/6) mottles; moderate to weak, angular blocky structure; common thin clay films on peds; gradual, smooth boundary.

C—68 to 108 inches +, strong-brown (7.5YR 5/6) very cherty silty clay loam (36 percent chert); yellowish-brown (10YR 5/6), light-gray (10YR 7/1), and light brownish-gray (2.5Y 6/2) mottles; weak, medium, angular blocky structure to structureless (massive); very firm when moist; slightly compact; very strongly acid.

The color of the Ap horizon ranges from 4 to 5 in value and from 3 to 6 in chroma. The texture of the Ap horizon in severely eroded places is silty clay loam.

The color of the B horizon ranges from 10YR to 5YR in hue, from 4 to 5 in value, and from 4 to 8 in chroma. The dominant hue of the C horizon is 10YR to 5YR. The C horizon in some profiles is less mottled than the one in the typical profile. The texture in some profiles is silty clay.

The solum is about 67 to 70 inches thick. The depth to bedrock is about 5 to 10 feet and is greater on stream terraces than on foot slopes. The bedrock is mostly green or black acid shale. The gravel and chert content of the solum ranges from about 17 to 35 percent and increases with depth. Approximately 80 percent of the coarse fragments are less than 6 inches in diameter.

Trimble soils are associated with Huntington, Bedford, Lawrence, Trappist, Rockcastle, and Colyer soils. Trimble soils have a finer textured subsoil than Huntington soils, which lack horizons of clay accumulation. Trimble soils are better drained, more cherty, and less mottled in the upper part of the B horizon than Lawrence soils, and they lack the fragipan that is characteristic of Lawrence and Bedford soils. Trimble soils are more cherty and have a less red subsoil than Trappist soils. They are more cherty and have a thicker subsoil that contains horizons of clay accumulation than Colyer and Rockcastle soils, and they are deeper to bedrock. Trimble soils are less clayey than Rockcastle soils.

Trimble cherty silt loam, 2 to 6 percent slopes (TsB).—This soil occurs on stream terraces and foot slopes. It has smooth to slightly convex slopes. Included in mapping were small acreages of Trappist and Bedford soils and a few areas of moderately eroded soils.

The natural fertility of this soil is moderate. The available moisture capacity is high. Although low in organic-matter content, the plow layer can be tilled throughout a fairly wide range in moisture content without clodding or crusting. The root zone is deep.

This soil is suited to most of the commonly grown crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–9; woodland group 1)

Trimble cherty silt loam, 6 to 12 percent slopes (TsC).—This soil occurs as long narrow bands on foot slopes. It has the profile described as representative for the series. The slopes are slightly convex. Included in mapping were small acreages of Trappist and Whitley soils and of a soil that has a loam plow layer and a clay loam subsoil, a few areas of moderately eroded and severely eroded soils, and some areas in which bedrock is at a depth of 20 to 30 inches.

The natural fertility of this soil is moderate. The available moisture capacity is moderate. Although low in organic-matter content, the plow layer can be tilled throughout a fairly wide range of moisture content without clodding or crusting. The root zone is deep.

This soil is suited to most of the commonly grown crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–6; woodland group 1)

Trimble cherty silt loam, 12 to 20 percent slopes (TsD).—This soil occurs as bands on foot slopes. It has convex slopes. It is shallower to bedrock than the soil that has the representative profile. Included in mapping were small acreages of Trappist, Colyer, and Rockcastle soils, of a soil that has a loam plow layer and a clay loam subsoil, of soils that are moderately and severely eroded, and of soils that have more than 20 percent slopes.

The natural fertility of this soil is moderate. The available moisture capacity is moderate. Although low in organic-matter content, the plow layer can be tilled throughout a fairly wide range of moisture content without clodding or crusting. The root zone is deep.

This soil is suited to only occasional cultivation because the erosion hazard is very severe. Hay and pasture (fig. 17) are better suited uses. Most grasses and legumes can be planted. (Capability unit IVe–3; woodland group 1)

Trimble cherty silty clay loam, 12 to 20 percent slopes, severely eroded (TtD3).—This soil is on convex foot slopes. It has a lighter colored, finer textured plow layer and is shallower to bedrock than the soil that has the representative profile. As a result of erosion, the plow layer is mostly subsoil. Shallow gullies are common. Included in mapping were small areas of Colyer and Rockcastle soils, of moderately eroded soils, and of Gullied land.

The natural fertility of this soil is moderately low, and the organic-matter content is very low. The available moisture capacity is moderate. The range within which the plow layer can be tilled without clodding or crusting is somewhat narrow. The root zone is moderately deep.

This soil is unsuited to cultivation because of the hazard of further erosion. It can be used for pasture, but grasses and legumes are difficult to establish and maintain. Other suitable uses are woodland and wildlife habitat. (Capability unit VIe–2; woodland group 3)

Weikert Series

The Weikert series consists of somewhat excessively drained, loamy soils that are shallow to bedrock. These soils developed in residuum weathered from acid shale, siltstone, and sandstone.

In a representative profile, the surface layer is light brownish-gray to pale-brown shaly silt loam about 8 inches thick. The subsoil is yellowish-brown, firm shaly silty clay loam about 7 inches thick. The underlying

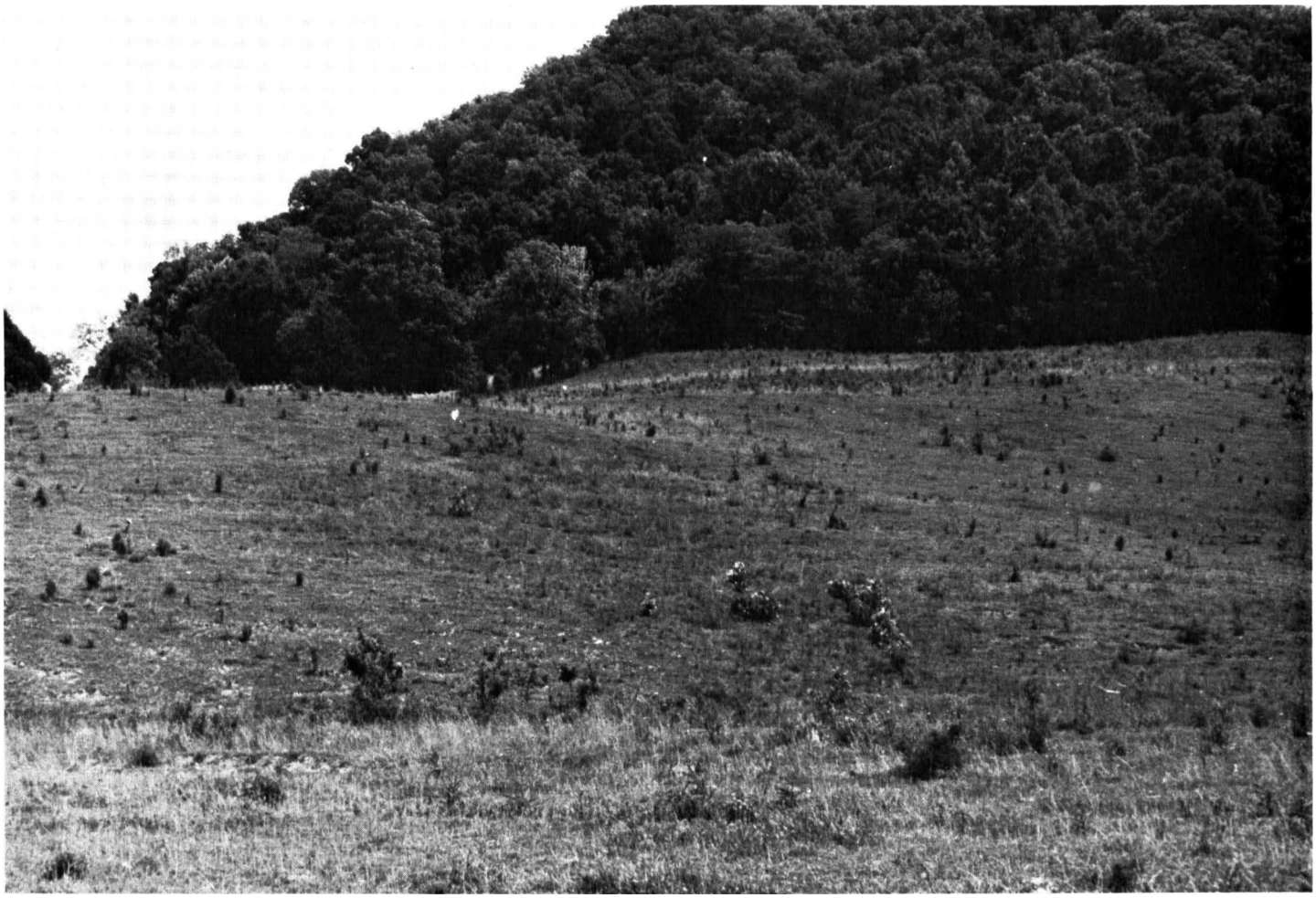

Figure 17.—**Pasture on Trimble cherty silt loam, 12 to 20 percent slopes, at center. Lawrence soils in foreground, and Weikert and Rockcastle in background.**

material is pale-brown, firm silty clay loam. At a depth of about 19 inches is bedrock.

The natural fertility of these soils is low, the organic-matter content is low, and the reaction is acid. Permeability is moderate, and the available moisture capacity is low. The root zone is shallow.

Soils of the Weikert series occur on uplands in the southern and western parts of Nelson County. Nearly all the acreage is wooded, mainly with oak and hickory. There are some stands of Virginia pine.

Representative profile of Weikert shaly silt loam:

O1—½ inch to 0, partly decayed leaves and twigs.
A1—0 to 1 inch, light brownish-gray (2.5Y 6/2) shaly silt loam; weak, fine, granular structure; friable; few chert fragments and shale fragments on surface and throughout horizon; strongly acid; clear, smooth boundary.
A2—1 to 8 inches, pale-brown (10YR 6/3) shaly silt loam; weak, fine, granular structure; friable; common roots; about 18 percent very small shale fragments; medium acid; gradual, smooth boundary.
B—8 to 15 inches, yellowish-brown (10YR 5/4) shaly light silty clay loam; weak, medium, subangular blocky structure; common roots; firm; few gray silt coatings; about 16 percent fine fragments of shale and siltstone; strongly acid; gradual, wavy boundary.
C—15 to 19 inches, pale-brown (10YR 6/3) light silty clay loam; structureless (massive); firm; few roots; about 23 percent small fragments of shale and siltstone; strongly acid; clear, wavy boundary.
R—19 inches +, slightly weathered, fine-grained sandstone.

The color of the A1 horizon ranges from 10YR to 2.5Y in hue, from 4 to 6 in value, and from 2 to 3 in chroma. The color of the A2 horizon ranges from 5 to 6 in value and from 2 to 4 in chroma.

The color of the B horizon ranges from 5 to 6 in value and from 3 to 6 in chroma. In texture, the B and C horizons in some profiles are silt loam.

The solum is about 9 to 18 inches thick. The reaction ranges from very strongly acid to medium acid. In some places, thin slabs of fine-grained sandstone are on the surface and throughout the profile. The content of coarse fragments ranges from about 10 to 40 percent.

Weikert soils are associated with Rockcastle and Baxter soils. They are less clayey, less cherty, and shallower to bedrock than Baxter soils, which have a red subsoil. Weikert soils have a subsoil that is redder and less clayey than that of Rockcastle soils.

Weikert soils are mapped as part of a complex with Rockcastle soils. The complex is described under the heading "Rockcastle Series."

Whitley Series

The Whitley series consists of deep, well-drained soils. These soils developed in colluvium that was derived chiefly from soils of shale origin but contained a minor amount of material derived from sandstone and limestone.

In a representative profile, the surface layer consists of 7 inches of dark grayish-brown to brown silt loam. The subsoil is mainly strong-brown silty clay loam to a depth of 38 inches. The underlying material is mottled, yellowish-brown silty clay loam or silty clay.

The natural fertility of these soils is high, the organic-matter content is low, and the reaction is strongly acid to very strongly acid. Permeability is moderate, and the available moisture capacity is high. Tillage is easy, and the plow layer can be tilled throughout a fairly wide range of moisture content without clodding or crusting. The root zone is deep.

Soils of the Whitley series occur in the southern and western parts of Nelson County. Approximately half the acreage has been cleared. The cleared acreage is used chiefly for pasture and hay; a small acreage is used for row crops, and the rest is idle land. The woodland consists mainly of oak, hickory, Virginia pine, and yellow-poplar.

Representative profile of Whitley silt loam, 6 to 12 percent slopes:

O1–2 to 0 inches, slightly decayed leaves, twigs, and pine needles.
A1—0 to 1 inch, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; many roots; few highly weathered shale fragments; strongly acid; clear, smooth boundary.
A2—1 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure and weak, medium, subangular blocky structure; very friable; many roots; few highly weathered shale fragments; very strongly acid; clear, smooth boundary.
B1—7 to 10 inches, brown (7.5YR 5/4) silt loam; weak, medium, angular blocky structure; firm; common roots; few highly weathered shale fragments; very strongly acid; gradual, smooth boundary.
B21t—10 to 24 inches, strong-brown (7.5YR 5/6) silty clay loam; some ped faces are dark brown (7.5YR 4/4); moderate, medium and fine, angular blocky structure; firm; common roots; thin continuous clay films on most ped faces; few, very small, highly weathered shale fragments; very strongly acid; gradual, smooth boundary.
B22t—24 to 32 inches, strong-brown (7.5YR 5/6) silty clay loam; common, medium, distinct variegations of yellowish-brown (10YR 5/6) and few coatings of pale brown (10YR 6/3); moderate to strong, medium, angular blocky structure; very firm; few roots; thin, almost continuous clay films on most ped faces; few, small, highly weathered shale fragments; very strongly acid; gradual, smooth boundary.
B3t—32 to 38 inches, strong-brown (7.5YR 5/6) silty clay loam; common yellowish-brown (10YR 5/4) and few, medium, pale-brown (10YR 6/3) and light-gray (10YR 6/1) variegations; moderate, medium and coarse, angular blocky structure; very firm; few thin clay films; few roots; few highly weathered shale fragments; very strongly acid; gradual, smooth boundary.
C—38 to 52 inches +, yellowish-brown (10YR 5/4) silty clay loam or silty clay; many, distinct variegations of strong brown (7.5YR 5/6), light gray (10YR 7/2), and yellowish red (5YR 5/6); mostly structureless (massive), but some weak, coarse, angular blocky structure; very firm; common weathered shale fragments; very strongly acid.

In plowed places there is an Ap horizon that is generally grayish-brown (10YR 5/2) but ranges from 4 to 5 in value and from 2 to 4 in chroma. The color of the A2 horizon is 4 to 5 in value and 2 to 3 in chroma. The Ap horizon in severely eroded places is silty clay loam.

The color of the B horizon ranges from 7.5YR to 10YR in hue, from 4 to 5 in value, and from 4 to 6 in chroma.

The dominant color of the C horizon ranges from yellowish brown to strong brown. In some profiles the texture of the C horizon is silty clay, and in some this horizon contains a stone line made up of thin slabs of sandstone 3 to 8 inches long.

The solum is about 32 to 45 inches thick. The depth to bedrock is about 4 to 7 feet. The reaction is strongly acid and very strongly acid. In some areas, 1 to 3 percent of the surface is covered with chert and sandstone fragments.

Whitley soils are associated with Trappist, Bedford, Lawrence, and Colyer soils. They have a less red subsoil and are deeper to bedrock than Trappist soils. They are better drained than Lawrence and Bedford soils, and they lack the fragipan of those soils. Whitley soils have a less

shaly and a much thicker subsoil than Colyer soils, and they are deeper to bedrock than those soils.

Whitley silt loam, 2 to 6 percent slopes (WhB).—This soil occurs on foot slopes. Included in mapping were small areas of a soil that has a subsoil of yellowish-red silty clay and some areas of moderately eroded soils.

This soil is suited to most of the commonly grown crops. When cultivated crops are grown the erosion hazard is moderate. (Capability unit IIe–1; woodland group 1)

Whitley silt loam, 6 to 12 percent slopes (WhC).—This soil occurs on slightly concave foot slopes. It has the profile described as representative for the series. Included in mapping were a few small areas of a soil that has a subsoil of yellowish-red silty clay, of severely eroded soils that have a silty clay loam plow layer, and of moderately eroded soils.

This soil is suited to most of the commonly grown crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–1; woodland group 1)

Whitley silt loam, 12 to 20 percent slopes (WhD).—This soil occurs on concave foot slopes. Included in mapping were small areas of Trappist soils, of severely eroded soils that have a silty clay loam plow layer, and of moderately eroded soils.

This soil is suited to only occasional cultivation because the erosion hazard is very severe. Hay and pasture are better uses. Most grasses and legumes can be grown. (Capability unit IVe–1; woodland group 1)

Woolper Series

The Woolper series consists of deep, dark-colored, well-drained soils that have a clayey subsoil. These soils developed in alluvium and colluvium derived from limestone.

In a representative profile, the plow layer is very dark grayish-brown silty clay loam about 9 inches thick. The subsoil is very dark brown to dark brown, very firm silty clay about 35 inches thick. The underlying material is dark-brown clay.

Permeability is moderately slow, and the available moisture capacity is high. The root zone is deep. The reaction is neutral or nearly so.

Soils of the Woolper series occupy foot slopes in the Outer Bluegrass Region in the northern part of Nelson County. Nearly all the acreage is cleared and used for row crops, hay, and pasture.

Osage-orange and young stands of locust grow in some areas, and some areas are idle.

Representative profile of Woolper silty clay loam, 2 to 6 percent slopes:

Ap—0 to 9 inches, very dark grayish-brown (10YR 3/2) silty clay loam; rubbed color is dark brown (10YR 3/3); moderate, fine, granular and some weak, medium, angular blocky structure; friable; few small fragments of limestone; neutral; clear, smooth boundary.

B21t—9 to 26 inches, very dark brown (10YR 2/2) silty clay; interior peds very dark grayish-brown (10YR 3/2); moderate, medium, angular blocky structure; very firm, sticky, slightly plastic; common roots; few fragments of limestone; neutral; gradual, smooth boundary.

B22t—26 to 37 inches, dark-brown (10YR 3/3) silty clay; moderate, medium and fine, angular blocky structure; very firm, sticky, slightly plastic; thin patchy clay films on ped faces; few small fragments of limestone; neutral; gradual, smooth boundary.

B3—37 to 44 inches, dark-brown (10YR 4/3) silty clay; weak, medium, angular blocky structure; very firm, sticky, slightly plastic; few small pebbles and fragments of limestone; neutral; clear, smooth boundary.

C—44 to 56 inches +, dark-brown (10YR 4/3) clay; few, fine, grayish-brown (2.5Y 5/2) and dark grayish-brown (10YR 4/2) mottles that increase in number with depth; weak, coarse, blocky structure; extremely firm, sticky, plastic; few pebbles and fragments of limestone; neutral.

A few profiles have a B1t horizon of very dark grayish-brown silty clay loam about 4 to 8 inches thick. The color of the B21t and B22t horizons ranges from 10YR to 7.5YR in hue and from 2 to 3 in value and in chroma. The color of the B3 horizon ranges from 3 to 4 in value and in chroma.

The C horizon in some profiles is olive (5Y 5/3).

The solum is about 40 to 50 inches thick. The depth to bedrock is about 5 to 10 feet. The reaction ranges from slightly acid to mildly alkaline. In a few places the upper part of the profile is 1 to 4 percent chert fragments.

Woolper soils are associated with Fairmount, Elk, Corydon, and Huntington soils. Woolper soils are darker colored and finer textured throughout the profile than Huntington and Elk soils. They have a much thicker, darker colored B horizon and are deeper to bedrock than Fairmount and Corydon soils, both of which have rock outcrops.

Woolper silty clay loam, 2 to 6 percent slopes (WoB).—This soil is on foot slopes and fans in narrow to moderately wide valleys. It has the profile described as representative for the series. Included in mapping were small areas of a soil that is mottled light olive brown and light brownish gray in the lower part of the subsoil and that is less well drained.

The natural fertility of this soil is high, and the organic-matter content is high. The plow layer is somewhat difficult to till because of the silty clay loam texture.

This soil is suited to all of the commonly grown crops. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–2; woodland group 2)

Woolper silty clay loam, 6 to 12 percent slopes (WoC).—This soil occurs on slightly concave foot slopes in narrow to moderately broad valleys. Included in mapping were small areas of a soil that is mottled light olive brown and light brownish gray in the lower part of the subsoil and that is less well drained. Also included were small areas of moderately eroded soils.

The natural fertility of this soil is high, and the organic-matter content is high. The plow layer is somewhat difficult to till because of the silty clay loam texture.

This soil is suited to all of the commonly grown crops. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–2; woodland group 2)

Woolper silty clay loam, 12 to 20 percent slopes, eroded (WoD2).—This soil occurs on slightly concave foot slopes. It has a slightly lighter colored plow layer than the soil that has the representative profile. Shallow gullies have formed in most places. Included in mapping were small areas of severely eroded soils that have a silty clay plow layer, of soils that have slopes of less than 12 percent, and of uneroded soils.

The natural fertility of this soil is moderate, and the organic-matter content is medium. The plow layer is somewhat difficult to till because of the silty clay loam texture.

This soil is suited to only occasional cultivation because the hazard of erosion is very severe. Most of the common crops can be grown, but hay and pasture are better uses. (Capability unit IVe–3; woodland group 2)

Zanesville Series

The Zanesville series consists of well drained to moderately well drained, loamy soils that have a fragipan. These soils developed in loess deposited over residuum weathered from sandstone and shale.

A representative profile in an area that is uneroded has a surface layer of grayish-brown to brown silt loam about 7 inches thick. The subsoil is about 32 inches thick. The uppermost 6 inches is brown silt loam, and the next 15 inches is strong-brown silty clay loam. The lowest part is a mottled silty clay loam fragipan. The underlying material is yellowish-brown, mottled silty clay loam.

The natural fertility of these soils is moderate. The reaction is strongly acid. Permeability is moderate above the pan and slow in the pan. The root zone is moderately deep to deep above the pan.

Soils of the Zanesville series occur on ridges in the western part of Nelson County. Most of the acreage is wooded, mainly with oak, hickory, and Virginia pine. Some of the acreage has been cleared, but nearly all this has reverted to Virginia pine. A small acreage is brushland.

Representative profile of Zanesville silt loam, 2 to 6 percent slopes:

O1—2 inches to 0, slightly decayed leaves and twigs.
A1—0 to ½ inch, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary.
A2—½ inch to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; abundant roots; very strongly acid; clear, smooth boundary.
B1—7 to 13 inches, brown (7.5YR 5/4) silt loam; weak, medium, subangular blocky structure; firm; abundant roots; strongly acid; gradual, smooth boundary.
B21t—13 to 23 inches, strong-brown (7.5YR 5/6) silty clay loam (less than 35 percent clay); moderate, medium, subangular blocky structure; firm; common roots; common clay films; strongly acid; gradual, smooth boundary.
B22t—23 to 28 inches, strong-brown (7.5YR 5/6) silty clay loam (less than 35 percent clay); few, fine, distinct, pale-brown (10YR 6/3) mottles; moderate, medium, subangular blocky structure; firm; few roots; common clay films; strongly acid; clear, smooth boundary.
Bx—28 to 39 inches, mottled yellowish-brown (10YR 5/6), light-gray (5Y 7/2), and olive-gray (5Y 5/2) silty clay loam (less than 35 percent clay); moderate, fine and medium, angular blocky structure; very firm, compact, brittle; common clay films; few fine particles of gray clay between the peds; few fine rock fragments; strongly acid; clear, wavy boundary.
C—39 to 54 inches +, yellowish-brown (10YR 5/4) silty clay loam; about 40 percent light brownish-gray (2.5Y 6/2) and few gray (5Y 5/1) mottles; weak, fine and medium, subangular blocky structure; firm; slightly sticky; few small fragments of reddish-brown and yellowish-brown sandstone; strongly acid.

Where plowed, these soils have a 5- to 8-inch Ap horizon of brown (10YR 4/3) silt loam. In moderately eroded places the color of this horizon is 5 in value.

The color of the B1 horizon ranges from 10YR to 7.5YR in hue and from 4 to 5 in chroma. The color of the B22t horizon in some profiles is 10YR in hue. The texture of the B1 horizon is silty clay loam in some profiles.

The solum is 36 to 45 inches thick. The depth to the fragipan ranges from about 26 to 32 inches, and the depth to bedrock from about 5 to 7 feet. The reaction is strongly acid to very strongly acid.

Zanesville soils are associated with Trappist and Tilsit soils. They have a coarser textured and less red subsoil than Trappist soils, which have a high shale content in the lower horizons. Zanesville soils have a fragipan, which Trappist soils lack. Zanesville soils are a few inches deeper to the fragipan than Tilsit soils. They are more brown and less yellow in the upper part of the subsoil than Tilsit soils, and they are somewhat better drained.

Zanesville silt loam, 2 to 6 percent slopes (ZaB).—This soil occurs on narrow to moderately broad ridges. It has the profile described as representative for the series.

The organic-matter content is low, but the plow layer is easy to till and can be worked throughout a fairly wide range of moisture content without clodding or crusting.

This soil is suited to most of the commonly grown crops, although the fragipan limits the root zone. There is a moderate hazard of erosion when cultivated crops are grown. (Capability unit IIe–10; woodland group 5)

Zanesville silt loam, 6 to 12 percent slopes, eroded (ZaC2).—This soil occurs on slightly convex ridgetops and upper side slopes. It has a lighter colored plow layer than the soil that has the representative profile. As a result of erosion, the plow layer is partly subsoil. Included in mapping were small areas of severely eroded soils and of Trappist and Tilsit soils.

This soil is suited to most of the commonly grown crops, although the fragipan limits the root zone. When cultivated crops are grown, the erosion hazard is severe. (Capability unit IIIe–8; woodland group 5)

Use and Management of the Soils

This section has five main parts. In the first part some general principles of soil management are discussed; in the second part the capability classification system is explained and the soils are placed in capability units; in the third part, estimates of yields of suitable crops are given for each of the soils under high and medium levels of management. The fourth and fifth parts discuss suitability of the soils for woodland and wildlife.

General Principles of Soil Management [2]

Some principles of management are general enough to apply to all the soils suitable for farm crops and pasture throughout the county, though individual soils or groups of soils require different kinds of management. These general principles of management are discussed in the following paragraphs.

Many soils in the county need lime or fertilizer or both. The amounts needed depend on the natural content of lime and plant nutrients, which are determined by laboratory analyses of soil samples; on the needs of the crop; and on the level of yield desired. Only general suggestions for applications of lime and fertilizer are given in this publication.

[2] WALTER J. GUERNSEY, conservation agronomist, Soil Conservation Service, helped prepare this section.

Most of the soils of Nelson County were never 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 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 to protect the structure.

All of the gently sloping and steeper soils that are cultivated are subject to erosion. Runoff and erosion occur mostly while a cultivated crop is growing or soon after one has been harvested. On erodible soils such as Pembroke silt loam, 2 to 6 percent slopes, a cropping system that controls runoff and erosion is needed, in combination with other erosion control practices. As used here, cropping system refers to the sequence of crops grown, in combination with management that includes minimum tillage, mulch planting, use of crop residue, growing of cover crops and green-manure crops, and use of lime and fertilizer. Other erosion control practices are contour cultivation, terracing, contour stripcropping, diversion of runoff, and use of grassed waterways. The effectiveness of a particular combination of these measures differs from one soil to another, but different combinations can be equally effective on the same soil.

The local representative of the Soil Conservation Service can assist you in planning an effective combination of practices.

On wet soils such as Newark silt loam, yields of cultivated crops can be increased by open ditch drainage 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; they can usually 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 pan. For drainage by either tile or open ditches, suitable outlets are needed.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive land-forming 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 rice, cranberries, horticultural crops, or other crops requiring 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 of groups of soils for range, for forest trees, or for engineering.

In the capability system, all kinds of soils are grouped at three levels: the capability class, the subclass, and the unit.

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

Class I soils have few limitations that restrict their use.

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

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

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife. (No class V soils in Nelson County.)

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

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

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (No class VIII soils in Nelson County.)

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

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

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–1 or IIe–2. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation, and the small letter indicates the subclass, or kind of limitation as defined in the foregoing paragraphs. The Arabic numeral, assigned on

a statewide basis, specifically identifies the capability unit within each subclass.

Management by capability units

The capability units in Nelson County are described in this part of the survey. The numbers of the capability units are assigned locally but are part of a statewide system. All of the units in the system are not represented by the soils of Nelson County; therefore, the numbers are not consecutive.

The names of soil series represented are mentioned in the description of each capability unit, but this does not mean that all the soils of a given series are in that unit. To find the capability classification of any given mapping unit, refer to the "Guide to Mapping Units" at the back of this survey.

CAPABILITY UNIT I–1

This unit consists of nearly level to level soils of the Huntington and Lindside series. These soils are on flood plains. They are moderately well drained to well drained. The natural fertility is high, the reaction is medium acid to mildly alkaline, the organic-matter content is medium, and the available moisture capacity is high. Permeability is moderate. The root zone is deep; the subsoil and the surface layer consist of friable silt loam.

The range of moisture content within which these soils can be tilled without clodding or crusting is wide. Some areas are damaged slightly by scouring during floods. Floods occur in winter and early in spring but seldom during the growing season. The Lindside soil has a slight limitation of wetness, but this can be eliminated by artificial drainage.

These soils are well suited to the cultivated crops and hay and pasture plants commonly grown in the area. Crops respond well to fertilizer, but most do not require lime. Winter grain is subject to damage by floods.

CAPABILITY UNIT I–3

This unit consists of nearly level soils of the Elk, Pembroke, and Russellville series. These soils are mostly well drained, but Russellville soils are well drained to moderately well drained. The available moisture capacity is moderate to high. The reaction is medium acid to very strongly acid, the organic-matter content is medium, and the natural fertility is moderate to high. The root zone is moderately deep to deep. The plow layer is friable silt loam, and the subsoil is firm silty clay loam. Russellville soils contain a slowly permeable fragipan, which restricts root penetration. Elk and Pembroke soils are moderately permeable.

All the soils of this unit are well suited to the cultivated crops and pasture and hay plants commonly grown in the county. Alfalfa usually dies out on Russellville soils after 3 to 4 years.

CAPABILITY UNIT IIe–1

This unit consists of gently sloping soils of the Elk, Hagerstown, Huntington, Pembroke, Shelbyville, and Whitley series. These soils are well drained and have high available moisture capacity. The reaction is very strongly acid to nearly neutral, the organic-matter content is medium to low, and the natural fertility is moderately high to high. Permeability is moderate. The root zone is deep. Tillage is easy, and the plow layer can be tilled throughout a wide range of moisture content without clodding or crusting.

All the soils of this unit are suited to the cultivated crops and pasture and hay plants commonly grown in the area. The response to fertilizer is good to excellent. All but the Huntington soil need lime for most crops. Because the erosion hazard is moderate in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good pasture cover.

CAPABILITY UNIT IIe–2

This unit consists of gently sloping soils of the Beasley, Lowell, and Woolper series. These soils are well drained. The available moisture capacity is high. The reaction is strongly acid to mildly alkaline, the organic-matter content is medium, and the natural fertility is moderately high to high. Permeability is moderately slow. The root zone is deep. Tillage is easy in Lowell and Beasley soils. It is somewhat difficult in Woolper soils because of the silty clay loam texture. All the soils can be tilled throughout a fairly wide range of moisture content without clodding or crusting. Lowell and Beasley soils need lime for most crops; Woolper soils do not. The response to lime and fertilizer is good.

All the soils of this unit are well suited to the cultivated crops and pasture and hay plants commonly grown in the area. Because the erosion hazard is moderate in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IIe–6

This unit consists of gently sloping soils of the Bedford and Tilsit series. These soils have a fragipan that restricts the movement of water and the growth of roots. They are moderately well drained. The available moisture capacity is moderate. The reaction is strongly acid and very strongly acid, the organic-matter content is medium, and the natural fertility is moderate to moderately high. Permeability is moderate above the fragipan and slow in the fragipan. Because of the fragipan, the root zone is only moderately deep. The plow layer is easy to till and can be worked throughout a wide range of moisture content without clodding or crusting.

All the soils of this unit are suited to the cultivated crops, pasture plants, and hay plants commonly grown in the area. Alfalfa and some other perennials are short lived because the root zone is saturated part of the year. The response of crops to lime and fertilizer is fair to good. Because the erosion hazard is moderate in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IIe–9

This unit consists of gently sloping soils of the Trappist and Trimble series. These soils are well drained and have moderate to high available moisture capacity. The reaction is very strongly acid, the organic-matter content is medium to low, and the natural fertility is moderate. Permeability is moderate to moderately slow. The

root zone is deep to moderately deep. Chert and gravel hinder tillage of Trimble soils, but Trappist soils are easy to till.

All the soils of this unit are suited to the cultivated crops and pasture and hay plants commonly grown in the area. Crops respond well to fertilizer and lime. Because the erosion hazard is moderate in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IIe–10

This unit consists of gently sloping soils of the Nicholson, Russellville, and Zanesville series. These soils are well drained to moderately well drained and have moderate available moisture capacity. Permeability is moderate above the fragipan and slow in the fragipan. The root zone is moderately deep to deep. The reaction is strongly acid to very strongly acid, the organic-matter content is medium to low, and the natural fertility is moderate. Tillage is easy, and good tilth is fairly easy to maintain.

All the soils of this unit are suited to the cultivated crops and pasture and hay plants commonly grown in the area. Crops respond well to lime and fertilizer. Because the erosion hazard is moderate in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IIw–1

This unit consists only of Bedford silt loam, 0 to 2 percent slopes, a soil that has a fragipan that restricts the movement of water and the growth of roots. This soil is moderately well drained. Permeability is moderate above the fragipan and slow in the pan. The available moisture capacity is moderate. The reaction is very strongly acid, the organic-matter content is medium, and the natural fertility is moderate. Because of the fragipan, the root zone is only moderately deep. It is saturated in winter, and it is somewhat slow to dry out and warm up in spring; consequently, tillage often has to be delayed. The plow layer is easy to till.

This soil is suited to crops that tolerate moderate wetness. The response of such crops to lime and fertilizer is fair to good. Alfalfa and orchardgrass generally die out in 1 to 3 years. Wetness can be reduced by open ditch drainage. Erosion is not a hazard.

CAPABILITY UNIT IIw–4

This unit consists only of Newark silt loam, a somewhat poorly drained soil that has a high water table part of the year. The available moisture capacity of this soil is high. The reaction is medium acid to mildly alkaline, the organic-matter content is medium, and the natural fertility is moderate. Permeability is moderate. Tillage is easy, but it often has to be delayed because the root zone is saturated in winter and is slow to dry out and warm up. Floods are likely after intensive storms.

This soil is suited to most cultivated crops and pasture and hay plants commonly grown in the area if it is artificially drained. It is well suited to grasses and legumes that withstand wetness. Crops respond well to fertilizer, and lime is not commonly needed. Wetness, which is the main limitation, can be reduced by artificial drainage.

CAPABILITY UNIT IIs–1

This unit consists only of Huntington silt loam, gravelly variant. This soil is well drained and has moderately rapid permeability and a moderate available moisture capacity. The reaction is medium acid to nearly neutral, the organic-matter content is medium, and the natural fertility is moderate. The root zone is deep. Tillage is hindered by the gravel. Flooding is a hazard, but floods seldom occur during the growing season.

This soil is suited to most of the common cultivated crops and pasture and hay plants. Crops respond well to fertilizer. Moderate amounts of lime are needed in some places, depending on the crop. The main limitations are the gravel and the resulting droughtiness.

CAPABILITY UNIT IIIe–1

This unit consists of sloping soils of the Crider, Elk, Hagerstown, Pembroke, and Whitley series. These soils are well drained and have high available moisture capacity. The reaction is nearly neutral to very strongly acid, the organic-matter content is medium to low, and the natural fertility is moderately high to high. Permeability is moderate. The root zone is deep. The plow layer is easy to till and can be tilled throughout a wide range of moisture content without clodding or crusting.

All the soils of this unit are suited to the cultivated crops and pasture and hay plants commonly grown in the area. The response to lime and fertilizer is good to excellent. Because the erosion hazard is severe in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IIIe–2

This unit consists of sloping, moderately eroded soils of the Beasley and Lowell series and gently sloping to sloping soils of the Markland and Woolper series. These soils are well drained and have high available moisture capacity and moderately slow permeability. They have a deep root zone. The surface layer is silt loam or silty clay loam, and the subsoil is silty clay or clay. The Woolper soil is high in organic-matter content and is slightly acid to mildly alkaline; the rest are low to medium in organic-matter content and are slightly acid to very strongly acid. The Woolper soil has a silty clay loam surface layer that hinders tillage.

All the soils of this unit are suited to the cultivated crops and pasture and hay plants commonly grown in the area. Crops respond well to fertilizer. Because the erosion hazard is severe in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IIIe–6

This unit consists only of Trimble cherty silt loam, 6 to 12 percent slopes. This soil is well drained and has moderate available moisture capacity. The reaction is very strongly acid, and the organic-matter content is low. Permeability is moderate. The root zone is deep.

Chert fragments and gravel, which make up 20 to 35 percent of the profile, hinder tillage.

This soil is suited to the cultivated crops and pasture and hay plants commonly grown in the area. The response to lime and fertilizer is fair to good. Because the erosion hazard is severe in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IIIe-7

This unit consists of gently sloping to sloping soils of the Corydon and Trappist series and a sloping, eroded soil of the Trappist series. These soils are well drained and have moderate available moisture capacity. The natural fertility is moderate, and the organic-matter content is medium to low. The Corydon soils have a moderately deep root zone underlain by hard limestone bedrock and are medium acid to mildly alkaline in reaction. Permeability is moderate. The Trappist soils have a deep to moderately deep root zone underlain by shale bedrock and are very strongly acid in reaction. Permeability is moderately slow. Tillage is easy.

All the soils of this unit are suited to the cultivated crops and pasture and hay plants commonly grown in the area. The response to fertilizer and lime is fair to good. Because the erosion hazard is severe in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IIIe-8

This unit consists of sloping, moderately eroded soils of the Bedford, Tilsit, and Zanesville series. These soils have a fragipan that restricts the movement of water and the growth of roots. They are moderately well drained. Permeability is moderate above the fragipan and slow in the pan. The available moisture capacity is moderate. The reaction is very strongly acid, the organic-matter content is low, and the natural fertility is moderate to moderately low. Because of the fragipan, the root zone is only moderately deep. Shallow gullies have formed in some areas.

All the soils of this unit are suited to most of the cultivated crops and pasture and hay plants commonly grown in the area. The response to fertilizer is fair. Lime is needed. Because the erosion hazard is severe in cultivated areas, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IIIw-1

This unit consists of nearly level soils of the Lawrence and McGary series. These soils are somewhat poorly drained and have moderate to high available moisture capacity. The reaction is strongly acid to very strongly acid, the organic-matter content is low, and the natural fertility is moderately low to moderate. The Lawrence soil has a fragipan that restricts the movement of water and the growth of roots. This soil is moderately permeable above the fragipan and slowly permeable in the pan. The McGary soil has a clayey subsoil and is slowly permeable. Both soils have a moderately deep root zone that is saturated in winter and remains wet well into the growing season.

Both soils of this unit are suited to pasture and hay plants that can withstand slight to moderate wetness. Unless drained they are poorly suited to the common cultivated crops. If effective drainage is established, crops give fair to good response to fertilizer and lime. Tile drainage is feasible for some areas of the McGary soil, but open ditch drainage is generally better for the Lawrence soil. The hazard of erosion is no more than slight.

CAPABILITY UNIT IIIw-5

This unit consists of nearly level soils of the Dunning and Melvin series. These soils are poorly drained to very poorly drained, and they have a high available moisture capacity. They have a seasonally high water table that keeps the root zone saturated throughout winter and spring. The Dunning soil has a silty clay loam surface layer that is somewhat difficult to till and a clayey subsoil that is slowly permeable. It is high in organic-matter content. The Melvin soil is loamy throughout and is moderately permeable. It is low in organic-matter content. Both soils are medium acid to mildly alkaline. Both have a deep root zone.

Flooding is a severe hazard to cultivated crops and small grains in many places, but pasture and hay can be grown. Tobacco does not grow well on these soils, but corn can be grown yearly in the same place if drainage is established. Crops give fair to good response to fertilizer if effective drainage is established. Lime generally is not needed. Many areas lack suitable outlets for tile drains. Erosion is not a hazard.

CAPABILITY UNIT IVe-1

This unit consists of sloping to strongly sloping soils of the Pembroke and Whitley series. These soils are moderately permeable and moderately high in natural fertility. These soils are well drained. Shallow gullies are common in the severely eroded Pembroke soil, and the plow layer of this soil is somewhat difficult to till because of the silty clay loam texture and the low organic-matter content. The plow layer of the Whitley soil is easy to till, in spite of the low organic-matter content, because the texture is silt loam. The reaction is medium acid to very strongly acid in both soils, except in limed places, where the reaction is nearly neutral.

Both soils of this unit are suited to only occasional cultivation, because of the excessive runoff, the strong slopes, and the risk of damage from erosion. They are better suited to pasture and hay than to cultivated crops. Kentucky bluegrass, smooth bromegrass, alfalfa, Ladino clover, Kentucky 31 tall fescue, orchardgrass, red clover, sericea lespedeza, and Korean lespedeza can be grown. The response to fertilizer and lime is good. Because of the severe erosion hazard, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IVe-3

This unit consists of dominantly strongly sloping soils of the Baxter, Beasley, Corydon, Faywood, Lowell, Trappist, Trimble, and Woolper series. These soils are well drained and are moderately to moderately slowly

permeable. They are medium to low in organic-matter content and are nearly neutral to very strongly acid in reaction. They are moderate to high in available moisture capacity and moderate to moderately high in natural fertility. The root zone is deep to moderately deep.

Most of these soils are moderately eroded; a few have a silty clay loam plow layer; the Baxter and Trimble soils are cherty. The plow layer of the eroded soils is partly subsoil, and in spots the subsoil is at the surface. The cherty soils and the silty clay loams are somewhat difficult to till. Runoff is excessive.

The soils of this unit are suited to only occasional cultivation, because of the very severe hazard of erosion. Pasture and hay are better uses. Cropping systems and other management practices must provide adequate control of erosion. Crops give fair to moderate response to fertilizer and lime. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IVe–6

This unit consists of Otway silty clay loam, 6 to 12 percent slopes, a somewhat excessively drained, alkaline soil underlain by calcareous shale and soft limestone. The root zone is moderately deep. The available moisture capacity is moderate, and permeability is moderately slow. Although the organic-matter content of the plow layer is high, tillage is difficult because of the silty clay loam texture. Runoff is excessive, and the hazard of erosion is very severe.

This unit is suitable for occasional cultivation, but row crops should be grown infrequently. Pasture and hay plants can be grown. Crops give fair response to fertilizer. Because of the severe erosion hazard, cropping systems and other management practices must provide adequate control of erosion. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IVe–11

This unit consists of sloping, severely eroded soils of the Beasley, Eden, Lowell, and Trappist series. These soils are well drained. Intake of water is slow, and permeability is moderately slow to slow. The organic-matter content is very low. The Eden soil is neutral in reaction; all the others are acid. As a result of past erosion, the plow layer is now mostly subsoil. Shallow to moderately deep gullies are common. The root zone is moderately deep to deep. Tillage is poor. Runoff is excessive.

The soils of this unit are suited to only occasional cultivation, because of the very severe hazard of further erosion. Cropping systems and other management practices must provide adequate control of erosion. Pasture and hay plants can be grown. It is important that pasture management provide for maintaining a good plant cover.

CAPABILITY UNIT IVw–1

This unit consists only of Robertsville silt loam. This soil has a fragipan that restricts drainage and limits the depth of the root zone. Permeability is slow, and natural drainage is poor. The root zone is saturated in winter and spring, but it is too shallow to hold enough moisture to carry plants through dry periods in the growing season. The natural fertility is moderately low, the organic-matter content is low, and the reaction is very strongly acid.

This soil is poorly suited to cultivated crops unless it is drained. Drainage is very difficult because of the slow movement of water through the fragipan. Some of the excess water can be removed through open drainage ditches, if outlets are available. Pasture and hay plants can be grown. Lime is needed for most crops. Erosion is not a hazard, but sod crops should be grown about half the time, for the purpose of maintaining structure and tilth.

CAPABILITY UNIT VIe–1

This unit consists of strongly sloping to moderately steep, slightly to moderately eroded soils of the Corydon, Fairmount, Faywood, Otway, and Markland series. These soils are shallow to deep. They are well drained to somewhat excessively drained, have moderate to slow permeability, and are somewhat droughty. The surface layer is silt loam or silty clay loam, and the subsoil is clay. The Fairmount, Faywood, and Otway soils are somewhat difficult to till because of the silty clay loam texture, and some areas of the Fairmount soils have flagstones in the plow layer.

These soils are not suited to cultivation, because of the severe risk of damage from erosion. They are well suited to pasture, and the less steep areas are suited to meadow. Kentucky 31 fescue and sericea lespedeza are the best suited of the grasses and legumes. Kentucky bluegrass, orchardgrass, red clover, and alfalfa are fairly well suited. All of these plants respond fairly well to fertilizer. The mixture selected for seeding should be the one that needs renovating least frequently.

A good plant cover is needed at all times, to slow runoff and limit erosion. Grazing should be so regulated as to maintain a minimum plant height of 3 inches. Periods without grazing are needed, to allow regrowth of the pasture plants.

CAPABILITY UNIT VIe–2

This unit consists of strongly sloping to moderately steep, severely eroded soils of the Beasley, Eden, Hagerstown, Lowell, Trappist, and Trimble series. These soils are fine textured or moderately fine textured. The Trimble soil is cherty, and one of the Eden soils is flaggy. Some of the soils are acid. All are droughty, and all are low in organic-matter content. All are likely to clod and crust if tilled. Permeability is moderate to slow. Erosion has removed most of the original surface layer. Shallow to moderately deep gullies are common.

The soils of this unit are not suitable for cultivation, because of the effects of erosion and the hazard of further erosion. Hay and pasture plants can be grown. Kentucky 31 tall fescue and sericea lespedeza are the best suited of the grasses and legumes. Kentucky bluegrass, orchardgrass, timothy, and red clover are moderately well suited. All of these plants respond well or fairly well to fertilizer and lime. The mixture selected for seeding should be the one that needs renovating least frequently.

A good plant cover is needed at all times, to slow runoff and limit erosion. Grazing should be so regulated as to maintain a minimum plant height of 3 inches. Periods without grazing are needed, to allow regrowth of the pasture plants.

CAPABILITY UNIT VIe-4

This unit consists of sloping to strongly sloping, severely eroded soils of the Corydon, Fairmount, Faywood, and Markland series. All but the Markland soil are shallow to moderately deep over limestone bedrock. All are droughty, and most are very low in organic-matter content. Permeability is moderate to moderately slow. Faywood and Corydon soils are mostly acid. As a result of past erosion, the plow layer is mostly subsoil. Shallow gullies and rock outcrops are common. The Fairmount soil is flaggy. Tillage is difficult because of the clayey texture and the coarse fragments.

These soils are not suitable for cultivation, because of the effects of erosion, the risk of further damage from erosion, and shallowness. Hay and pasture plants can be grown. Kentucky 31 tall fescue, sericea lespedeza, and Korean lespedeza are the best suited of the grasses and legumes. These plants respond fairly well to fertilizer and lime.

A good plant cover is needed at all times, to slow runoff and limit erosion. Grazing should be so regulated as to maintain a minimum plant height of 3 inches. Periods without grazing are needed, to allow regrowth of the pasture plants.

CAPABILITY UNIT VIs-1

This unit consists only of Corydon very rocky silt loam, 6 to 20 percent slopes, eroded. This soil is shallow to moderately deep over limestone bedrock. As a result of erosion, the plow layer contains some of the clayey subsoil. Shallow gullies are common, and rock outcrops cover 10 to 25 percent of the surface. The reaction is medium acid to mildly alkaline. The organic-matter content is low, and the natural fertility is moderate. Permeability and available moisture capacity are moderate. Intake of water is somewhat slow, and runoff is excessive.

This soil is not suitable for cultivation, because it is droughty, rocky, and erodible. Outcrops and loose rocks hinder tillage and make seedbed preparation difficult. Pasture plants grow fairly well. Kentucky bluegrass, orchardgrass, red clover, sweet clover, and Korean lespedeza can be grown, but the stands are short lived. Kentucky 31 tall fescue and sericea lespedeza provide better vegetative cover. These plants respond moderately well to fertilizer. The mixture selected for seeding should be the one that needs renovating least frequently.

A good plant cover is needed at all times. Grazing should be so regulated as to maintain a minimum plant height of 3 inches. Periods without grazing are needed, to allow regrowth of the pasture plants.

CAPABILITY UNIT VIs-3

This unit consists of sloping to strongly sloping soils of the Colyer, Rockcastle, Shrouts, and Otway series. These soils are somewhat excessively drained and are low in available moisture capacity. The Colyer soil is moderately permeable; the rest are slowly or moderately slowly permeable. Water intake is slow, and runoff is excessive. The root zone is shallow. The natural fertility is low. The Colyer and Rockcastle soils are very strongly acid. The Rockcastle soil has a clayey subsoil. The Shrouts and Otway soils are alkaline and clayey. The Shrouts soil is severely eroded and gullied.

These soils are not suitable for cultivation, because of the shallow root zone, the low available moisture capacity, and the risk of erosion. They are poorly suited to hay crops. Woodland, wildlife habitat, and pasture are better uses. Kentucky 31 tall fescue, sericea lespedeza, and Korean lespedeza are the only common pasture plants that will provide an adequate vegetative cover. These plants respond fairly well to fertilizer. The mixture selected for seeding should be the one that needs renovating least frequently.

A good plant cover is needed at all times, to slow runoff and limit erosion. Grazing should be so regulated as to maintain a minimum plant height of 3 inches. Periods without grazing are needed, to allow regrowth of the pasture plants.

CAPABILITY UNIT VIIe-1

This unit consists of strongly sloping to steep, moderately eroded and severely eroded soils of the Corydon, Eden, Fairmount, and Markland series. These soils are somewhat excessively drained and are droughty. Runoff is excessive because of the slow intake of water. The natural fertility is moderate to low, the organic-matter content is very low, and the workability is poor. Reaction is medium acid to alkaline. Permeability is moderately slow to slow. Erosion has removed most of the original surface layer. Shallow gullies are common. The root zone is shallow to moderately deep. The Corydon soil is very rocky; the Fairmount soil and one Eden soil are flaggy.

These soils are not suitable for cultivation, because of the erosion hazard. Woodland and wildlife habitat are better uses. Pasture stands are short lived, and renovation of pastures is difficult because of the difficulty and danger of using farm machinery on the strong to steep slopes. Kentucky 31 tall fescue and sericea lespedeza are the best suited of the few kinds of pasture plants that can be grown.

A good plant cover is needed at all times, to slow runoff and limit erosion. Grazing should be so regulated as to maintain a minimum plant height of 3 inches. Periods without grazing are needed, to allow regrowth of the pasture plants.

CAPABILITY UNIT VIIe-4

This unit consists of Gullied land, acid shaly materials, and Gullied land, calcareous shaly materials. The gullies are moderately deep to deep, and the areas between gullies are moderately to very severely eroded. Small areas of limestone and acid shale outcrop are included.

These areas were never very well suited to cultivation, because of shallowness to shale bedrock, the clayey texture in most areas, and the very strongly acid reaction. They are either idle or reverting to eastern redcedar, pine, or brush. Very few areas can be reclaimed economically for pasture. Woodland and wildlife habitat are better uses.

CAPABILITY UNIT VIIs-1

This unit consists of moderately steep to steep soils of the Colyer, Rockcastle, and Weikert series. These soils are underlain at a depth of 8 to 20 inches by acid shale or sandstone. They are somewhat excessively drained and have low available moisture capacity. The natural fertility is low, the organic-matter content is medium to

low, and the reaction is strongly acid to very strongly acid. Permeability is moderate to slow.

These soils are suitable for woodland, for wildlife habitat, and, to a limited extent, for pasture. The slopes hinder the operation of equipment. Unless cover is maintained, runoff is excessive and the erosion hazard is very severe. The amount of forage produced is usually small. The pasture plants best suited are Kentucky 31 tall fescue and sericea lespedeza. Other plants are extremely short lived.

A good plant cover is needed at all times, to slow runoff and limit erosion. Grazing should be so regulated as to maintain a minimum plant height of 3 inches. Periods without grazing are needed, to allow regrowth of the pasture plants.

CAPABILITY UNIT VIIs-3

This unit consists of sloping to moderately steep soils of the Colyer, Rockcastle, Shrouts, and Otway series. The Colyer and Rockcastle soils contain shale fragments, are shallow over acid shale bedrock, and are strongly acid in reaction. The Shrouts and Otway soils are shallow over calcareous shale or limestone and are moderately alkaline in reaction. Permeability is moderate in Colyer soils and moderately slow to slow in all the others. The Colyer soil is moderately fine textured. All the others are fine textured. The Otway soil is only slightly eroded. It has a dark-colored surface layer and is high in organic-matter content. All the others are severely eroded; most of their original surface layer is gone, the organic-matter content is low, and shallow to moderately deep gullies are common.

These soils are not suitable for cultivation. Establishing pasture stands is difficult. Kentucky 31 tall fescue and sericea lespedeza are the pasture plants most likely to survive. Woodland and wildlife habitat are suitable uses.

CAPABILITY UNIT VIIs-5

This unit consists of the Rock land-Corydon complex, more than half of which is rock outcrop and soil material less than 6 inches deep over bedrock. The rest consists of soils interspersed between the rock outcrops. These soils generally have a silty clay loam surface layer and a clayey subsoil and are shallow to moderately deep over limestone bedrock.

The root zone is shallow to moderately deep, and the available moisture capacity is low. Permeability is moderate. Runoff is excessive unless a protective cover is maintained.

This unit is best suited to woodland, wildlife habitat, or a combination of these. Most of the acreage is wooded, but a few areas have a cover of wild grass and brush. The rock outcrops restrict the use of equipment.

Estimated Yields

Table 2 gives estimated average yields of the crops most commonly grown in Nelson County, under a high level and a medium level of management.

A high level of management includes (1) the use of adapted varieties; (2) proper seeding rates, inoculation of legumes, proper dates of planting, and efficient harvesting methods; (3) control of weeds, insects, and plant diseases; (4) application of fertilizer in amounts equal to or greater than current recommendations of the University of Kentucky Agricultural Experiment Station, or equal to or greater than the need shown by properly interpreted soil tests; (5) adequate lime applications; (6) drainage of naturally wet soils if drainage is feasible; (7) cropping systems that control erosion and maintain soil structure, tilth, and organic matter; (8) control of erosion by means of contour tillage, terracing, contour stripcropping, and the use of grassed waterways; (9) use of cover crops and crop residues to increase supplies of organic matter and to control erosion; (10) use of all the applicable pasture management practices; and (11) minimum tillage, interseeding winter crops in row crops, and other applicable practices.

The high-level management described is not considered the maximum level possible, but it is one that many farmers will find practical. It will result in the highest sustained production that is economically feasible.

A medium level of management is the minimum that will keep the soil from deteriorating and still produce sufficient crops for some profit.

Yields given in table 2 are averages that can be expected over several years. Yields for a given year may be low because of unfavorable weather, insects, disease, or some other disaster, or they may be extremely high because of a combination of good factors.

Yields to be expected under a medium level of management are shown in columns A, and those to be expected under a high level of management are shown in columns B. No estimates for a medium level of management are given for tobacco, since it is nearly always grown under a high level of management.

Woodland [3]

Nelson County, except for some grassy glades, once was covered by deciduous forest. In the Outer Bluegrass Region, where the soils were derived mostly from limestone and calcareous shale, the forest was made up mainly of white oak, northern red oak, yellow-poplar, white ash, black walnut, cherry, and chestnut. In the Knobs Region, where the soils were derived mostly from acid shale and siltstone, the stands consisted mainly of scarlet oak, black oak, eastern redcedar, chestnut oak, and hickory; they included a little Virginia pine. On the lowlands, mainly along Rolling Fork, the stands were made up mainly of sweetgum, pin oak, and sycamore.

These forests have been disturbed repeatedly. Some of the acreage that was cleared and farmed was later abandoned and has restocked naturally with pine and other species. Many second-growth stands are being cut, either to obtain wood crops for market or to clear land for farming.

About 25 percent of Nelson County is now privately owned woodland. The wooded areas are mostly in the Knobs Region, which has rough terrain and steep slopes.

Woodland grouping

The soils of Nelson County have been placed in 11 woodland groups. Each group is made up of soils that are suitable for similar kinds of wood crops, need similar management, and are about equal in productivity.

[3] By WILLIAM M. MORELL, woodland conservationist, Soil Conservation Service.

TABLE 2.—*Estimated average yields*

[Yields in columns A are those to be expected under medium-level management; those in columns B, under high-level management. Dashes indicate that the soil is considered unsuitable for the crop or the crop is not commonly grown on the soil]

Soils	Corn				Tobacco	Wheat		Hay						Pasture (Tall grasses and legumes)	
	Grain		Silage					Alfalfa and grass		Red clover and grass (2nd year)		Lespedeza (Korean or Kobe)			
	A	B	A	B	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Tons*	*Tons*	*Lb.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days*[1]	*Cow-acre-days*[1]
Baxter cherty silt loam, 12 to 20 percent slopes	55	75	11	15	2,100	20	30	2.4	3.5	1.6	2.6			145	190
Beasley silt loam, 2 to 6 percent slopes	65	95	13	19	2,600	25	35	3.2	4.1	2.0	3.0	1.2	1.8	160	205
Beasley silt loam, 6 to 12 percent slopes, eroded	50	80	10	16	2,100	30	20	2.6	3.7	1.5	2.3	1.1	1.6	155	200
Beasley silt loam, 12 to 20 percent slopes, eroded	35	70	7	14		15	25	2.5	3.6	1.3	2.1			145	190
Beasley silty clay loam, 6 to 12 percent slopes, severely eroded	30	55	6	11		10	15	1.9	2.7	1.1	1.8	.7	1.0	125	175
Beasley silty clay loam, 12 to 20 percent slopes, severely eroded														120	170
Bedford silt loam, 0 to 2 percent slopes	50	80	10	16	2,450	20	35	1.6	3.0	1.7	2.7	1.0	1.6	145	210
Bedford silt loam, 2 to 6 percent slopes	50	85	10	17	2,600	20	35	1.6	3.0	1.7	2.8	1.0	1.7	145	210
Bedford silt loam, 6 to 12 percent slopes, eroded	40	75	8	15	2,200	15	25	1.3	2.7	1.4	2.3	.9	1.3	135	190
Colyer silt loam, 6 to 20 percent slopes														70	115
Colyer shaly silty clay loam, 6 to 30 percent slopes, severely eroded															
Colyer shaly silt loam, 20 to 50 percent slopes														45	80
Corydon silt loam, 2 to 6 percent slopes	45	70			1,880	20	30	2.1	3.3	1.6	2.5	1.0	1.5	105	190
Corydon silt loam, 6 to 12 percent slopes, eroded						15	30	2.0	3.0	1.4	2.3	.9	1.4	100	170
Corydon silt loam, 12 to 20 percent slopes, eroded														90	160
Corydon silty clay, 6 to 20 percent slopes, severely eroded														70	130
Corydon very rocky silt loam, 6 to 20 percent slopes, eroded														85	145
Corydon very rocky silty clay, 12 to 30 percent slopes, severely eroded															110
Crider silt loam, 6 to 12 percent slopes	65	105	13	21	2,900	30	45	3.5	4.4	2.1	3.0	1.3	1.9	175	250
Dunning silty clay loam	70	90	14	18								.9	2.0	175	240
Eden silty clay loam, 30 to 50 percent slopes, eroded														85	125
Eden silty clay, 6 to 12 percent slopes, severely eroded	25	50	5	10	1,700	10	20	2.4	3.4	1.0	1.8	.6	1.1	120	195
Eden silty clay, 12 to 30 percent slopes, severely eroded														70	140
Eden flaggy clay, 20 to 30 percent slopes, severely eroded														65	135
Eden flaggy clay, 30 to 50 percent slopes, severely eroded														40	100
Elk silt loam, 0 to 2 percent slopes	70	115	14	23	3,200	25	40	3.6	4.8	2.1	3.0	1.4	2.0	180	275
Elk silt loam, 2 to 6 percent slopes	70	110	14	22	3,200	25	40	3.6	4.8	2.1	3.0	1.4	2.0	180	275
Elk silt loam, 6 to 12 percent slopes	60	105	12	21	2,900	20	35	3.5	4.7	2.1	3.0	1.4	2.0	175	270
Fairmount silty clay loam, 6 to 20 percent slopes														55	115
Fairmount flaggy silty clay loam, 12 to 30 percent slopes														55	115
Fairmount flaggy clay, 6 to 20 percent slopes, severely eroded														45	105

See footnote at end of table.

TABLE 2.—*Estimated average yields*—Continued

Soils	Corn				Tobacco	Wheat		Hay						Pasture (Tall grasses and legumes)	
	Grain		Silage					Alfalfa and grass		Red clover and grass (2nd year)		Lespedeza (Korean or Kobe)			
	A	B	A	B	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Tons*	*Tons*	*Lb.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Fairmount flaggy clay, 20 to 50 percent slopes, severely eroded	----	------	----	----	-------	----	----	------	------	------	------	------	------	25	80
Faywood silty clay loam, 6 to 12 percent slopes, eroded	35	65	7	13	2, 200	15	25	2. 8	3. 8	1. 4	2. 3	. 9	1. 4	140	215
Faywood silty clay loam, 12 to 20 percent slopes, eroded	----	------	----	----	-------	----	----	------	------	------	------	------	------	75	140
Faywood silty clay, 6 to 20 percent slopes, severely eroded	----	------	----	----	-------	----	----	------	------	------	------	------	------	50	120
Gullied land, acid shaly materials	----	------	----	----	-------	----	----	------	------	------	------	------	------	------	------
Gullied land, calcareous shaly materials	----	------	----	----	-------	----	----	------	------	------	------	------	------	------	------
Hagerstown silt loam, 2 to 6 percent slopes	75	120	15	24	3, 200	30	45	3. 8	4. 8	2. 1	3. 0	1. 5	2. 0	190	275
Hagerstown silt loam, 6 to 12 percent slopes	65	105	13	21	2, 900	25	40	3. 5	4. 7	2. 0	2. 9	1. 4	1. 9	175	270
Hagerstown silty clay loam, 6 to 20 percent slopes, severely eroded	45	85	9	17	2, 100	15	25	3. 0	4. 0	1. 6	2. 5	1. 0	1. 4	150	220
Huntington silt loam, 0 to 4 percent slopes	75	125	15	25	3, 200	35	45	4. 2	5. 2	2. 1	3. 0	1. 4	2. 0	210	295
Huntington silt loam, 4 to 12 percent slopes	70	105	14	21	3, 000	30	40	4. 0	5. 0	2. 0	2. 9	1. 3	1. 9	200	285
Huntington silt loam, gravelly variant	60	90	12	18	2, 900	25	35	2. 8	3. 8	2. 1	3. 0	1. 3	1. 9	165	220
Lawrence silt loam	40	75	8	15	2, 150	10	20	------	------	. 9	1. 9	1. 0	1. 6	130	200
Lindside silt loam	70	115	14	23	2, 900	25	40	3. 5	4. 5	2. 0	3. 0	1. 0	2. 0	180	255
Lowell silt loam, 2 to 6 percent slopes	60	100	12	20	2, 900	30	40	3. 3	4. 2	2. 1	3. 0	1. 5	2. 0	165	240
Lowell silt loam, 6 to 12 percent slopes, eroded	55	90	11	18	2, 500	20	35	3. 1	4. 0	2. 0	3. 0	1. 3	1. 9	160	230
Lowell silt loam, 12 to 20 percent slopes, eroded	50	80	10	16	2, 300	15	25	2. 6	3. 5	2. 0	3. 0	------	------	150	195
Lowell silty clay loam, 6 to 12 percent slopes, severely eroded	40	75	8	15	2, 150	10	20	2. 2	3. 1	1. 6	2. 5	1. 0	1. 6	110	180
Lowell silty clay loam, 12 to 20 percent slopes, severely eroded	----	------	----	----	-------	----	----	------	------	------	------	------	------	105	175
Markland silt loam, 2 to 12 percent slopes	50	80	10	16	2, 300	15	25	3. 0	3. 8	1. 6	2. 7	1. 2	1. 9	150	215
Markland silt loam, 12 to 20 percent slopes, eroded	----	------	----	----	-------	----	----	------	------	------	------	------	------	110	185
Markland silty clay, 6 to 12 percent slopes, severely eroded	----	------	----	----	-------	----	----	------	------	------	------	------	------	80	150
Markland silty clay, 12 to 20 percent slopes, severely eroded	----	------	----	----	-------	----	----	------	------	------	------	------	------	75	140
McGary silt loam	45	75	9	15	1, 900	15	30	------	------	1. 0	1. 9	1. 1	1. 9	130	200
Melvin silt loam	----	80	----	16	-------	----	----	------	------	------	------	. 8	1. 8	130	200
Newark silt loam	60	100	12	20	2, 500	20	35	------	------	1. 5	2. 5	1. 1	1. 8	155	235
Nicholson silt loam, 2 to 6 percent slopes	60	95	12	19	2, 700	25	35	3. 0	4. 1	2. 0	3. 0	1. 3	2. 0	150	230
Otway silty clay loam, 6 to 12 percent slopes	20	50	4	10	-------	10	20	2. 4	3. 5	1. 4	2. 2	. 8	1. 4	135	180
Otway silty clay loam, 12 to 30 percent slopes	----	------	----	----	-------	----	----	------	2. 3	------	1. 8	------	------	65	130
Pembroke silt loam, 0 to 2 percent slopes	75	120	15	24	3, 200	30	45	4. 0	5. 0	2. 1	3. 0	1. 4	2. 0	200	285
Pembroke silt loam, 2 to 6 percent slopes	70	115	14	23	3, 200	30	45	4. 0	5. 0	2. 1	3. 0	1. 4	2. 0	200	285
Pembroke silt loam, 6 to 12 percent slopes	55	105	11	21	2, 900	25	40	3. 5	4. 7	2. 0	2. 9	1. 3	1. 9	175	270
Pembroke silty clay loam, 6 to 12 percent slopes, severely eroded	40	75	8	15	2, 400	20	30	3. 0	4. 0	1. 7	2. 4	1. 0	1. 6	155	230

See footnote at end of table.

TABLE 2.—*Estimated average yields*—Continued

Soils	Corn				Tobacco	Wheat		Alfalfa and grass		Red clover and grass (2nd year)		Lespedeza (Korean or Kobe)		Pasture (Tall grasses and legumes)	
	Grain		Silage												
	A	B	A	B	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Tons*	*Tons*	*Lb.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Robertsville silt loam	----	65	----	13	--------	----	----	------	------	------	------	.7	1.6	100	170
Rockcastle silt loam, 12 to 20 percent slopes	----	------	----	----	--------	----	----	------	------	------	------	------	------	60	110
Rockcastle silt loam, 20 to 50 percent slopes	----	------	----	----	--------	----	----	------	------	------	------	------	------	45	9
Rockcastle shaly silty clay, 12 to 30 percent slopes, severely eroded	----	------	----	----	--------	----	----	------	------	------	------	------	------	------	------
Rockcastle-Weikert complex, 20 to 50 percent slopes	----	------	----	----	--------	----	----	------	------	------	------	------	------	45	95
Rock land-Corydon complex	----	------	----	----	--------	----	----	------	------	------	------	------	------	------	------
Russellville silt loam, 0 to 2 percent slopes	65	100	13	20	3,050	25	40	3.0	4.1	1.9	2.7	1.2	1.9	155	235
Russellville silt loam, 2 to 6 percent slopes	60	95	12	19	3,050	25	40	3.0	4.1	2.0	2.8	1.2	1.9	155	235
Shelbyville silt loam, 2 to 6 percent slopes	70	110	14	22	3,200	30	45	3.6	4.8	2.1	3.0	1.5	2.0	180	275
Shrouts-Otway complex, 6 to 12 percent slopes	----	------	----	----	--------	----	----	------	3.0	------	1.8	------	1.3	95	160
Shrouts-Otway complex, 12 to 30 percent slopes	----	------	----	----	--------	----	----	------	------	------	------	------	------	60	130
Tilsit silt loam, 2 to 6 percent slopes	50	80	10	16	2,500	20	35	1.5	3.0	1.5	2.4	1.1	1.8	125	200
Tilsit silt loam, 6 to 12 percent slopes, eroded	40	70	8	14	2,250	15	25	1.6	3.0	1.1	1.9	.8	1.6	105	180
Trappist silt loam, 2 to 6 percent slopes	55	80	11	16	2,550	25	40	2.4	3.7	1.8	2.7	1.2	1.9	120	200
Trappist silt loam, 2 to 6 percent slopes, eroded	50	75	10	15	2,450	20	35	2.3	3.6	1.6	2.5	1.1	1.7	115	195
Trappist silt loam, 6 to 12 percent slopes	50	75	10	15	2,250	20	35	2.3	3.6	1.7	2.6	1.2	1.8	115	190
Trappist silt loam, 6 to 12 percent slopes, eroded	45	70	9	14	2,150	15	30	2.1	3.4	1.4	2.3	1.1	1.7	105	185
Trappist silt loam, 12 to 20 percent slopes	40	65	8	13	1,950	15	30	2.0	3.0	1.7	2.5	------	------	100	170
Trappist silt loam, 12 to 20 percent slopes, eroded	35	60	7	12	1,850	15	25	1.8	2.9	1.3	2.2	------	------	90	165
Trappist silty clay loam, 6 to 12 percent slopes, severely eroded	30	55	6	11	1,750	10	20	1.5	2.8	1.1	1.8	.8	1.3	75	160
Trappist silty clay loam, 12 to 20 percent slopes, severely eroded	----	------	----	----	--------	----	----	------	------	------	------	------	------	65	140
Trimble cherty silt loam, 2 to 6 percent slopes	50	85	10	17	2,600	25	35	2.5	3.8	2.0	3.0	1.2	1.8	160	205
Trimble cherty silt loam, 6 to 12 percent slopes	45	80	9	16	2,300	25	35	2.4	3.7	1.9	2.8	1.1	1.7	155	195
Trimble cherty silt loam, 12 to 20 percent slopes	40	70	8	14	2,000	20	30	2.0	3.2	1.8	2.6	------	------	135	180
Trimble cherty silty clay loam, 12 to 20 percent slopes, severely eroded	----	------	----	----	--------	----	----	------	------	------	------	------	------	130	165
Whitley silt loam, 2 to 6 percent slopes	55	90	11	18	2,600	25	35	3.0	4.0	2.0	3.0	1.3	1.9	150	220
Whitley silt loam, 6 to 12 percent slopes	50	85	10	17	2,400	25	35	3.0	4.0	1.9	2.9	1.2	1.8	150	215
Whitley silt loam, 12 to 20 percent slopes	45	75	9	15	2,100	20	30	3.1	4.0	1.8	2.7	------	------	165	210
Woolper silty clay loam, 2 to 6 percent slopes	65	105	13	21	2,900	25	40	4.0	5.0	2.1	3.0	1.4	2.0	200	285
Woolper silty clay loam, 6 to 12 percent slopes	60	100	12	20	2,600	25	35	3.2	4.1	2.0	2.9	1.3	1.9	160	235

See footnote at end of table.

TABLE 2.—*Estimated average yields*—Continued

Soils	Corn				Tobacco	Wheat		Hay						Pasture (Tall grasses and legumes)	
	Grain		Silage					Alfalfa and grass		Red clover and grass (2nd year)		Lespedeza (Korean or Kobe)			
	A	B	A	B	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Tons*	*Tons*	*Lb.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Woolper silty clay loam, 12 to 20 percent slopes, eroded	45	80	9	16	2, 200	15	30	2. 5	3. 5	1. 3	2. 1	------	------	125	195
Zanesville silt loam, 2 to 6 percent slopes	60	95	12	19	2, 675	25	35	2. 5	3. 5	1. 9	3. 0	1. 3	2. 0	130	210
Zanesville silt loam, 6 to 12 percent slopes, eroded	55	85	11	17	2, 300	20	30	2. 2	3. 2	1. 8	2. 8	1. 2	1. 9	110	180

[1] The number of days that 1 acre will support 1 animal unit (1 cow, 1 steer, or 1 horse; 5 hogs; or 7 sheep or goats) without injury to the pasture. For example, an acre of pasture of Kentucky 31 tall fescue and sericea lespedeza that provides grazing for 2 cows for 100 days has a capacity of 200 cow-acre-days.

The descriptions of the woodland groups include the following information: potential productivity for several kinds of trees, predictions of yearly growth, species to favor in managing woodland already on the site, species to favor for planting in cleared or nonstocked areas; and soil-related limitations that affect woodland management.

Potential productivity is expressed as a site index. Site index is the average height, in feet, that the tallest trees in a well-stocked stand will attain at a specified age (50 years for most species). Site index classes having a range of 10 feet are given in the descriptions of the woodland groups. For example, the site index for oaks in woodland group 1 is expressed as 80 to 90 feet. Site index classes of this range are exact enough for most forest management, but more precise information is available for many individual soils.

This site index information is based on sample measurements taken in forest stands on identified soils in this county and in adjacent areas. The stands were well-stocked, naturally occurring, even aged, and essentially unmanaged, and they had not been adversely affected by fire, insects, or disease nor damaged by grazing.

The average height and age measurements for most species were converted to site indexes by using site index curves in published research (*3*, *4*, *5*, *8*, *12*) and (*17*). Unpublished field studies by the Tennessee Valley Authority of 271 plots were used to determine the site indexes for eastern redcedar.

Predictions of average yearly growth per acre are given in board feet, according to the International ¼-inch rule, and are based on published data (*10*, *12*) and on evaluations made by the Soil Conservation Service. Estimates were made for oak and yellow-poplar up to age 60 and for other species up to age 50.

The species to favor in existing stands are those that should be retained for future harvest when intensive forest management operations such as weeding and thinning are being done.

The species to favor for planting are listed in each woodland suitability group.

The limitations that affect woodland management are erosion hazard, equipment limitation, plant competition, and seedling mortality.

The erosion hazard is based on the assumption that the woodland is protected from fire and overgrazing but no special measures are taken to control erosion. Generally, the erosion hazard is slight if the slope is 12 percent or less, moderate if the slope is 12 to 20 percent, and severe if the slope is more than 20 percent. Characteristics of specific soils may modify these general guidelines. Woodland can be protected from erosion by varying the rotation age and adjusting the cutting cycles; by properly constructing and maintaining roads, trails, and landings; and by using special management techniques.

The equipment limitation depends on topographic features and soil characteristics that restrict the use of conventional wheel or track-type equipment for planting and harvesting wood crops, for constructing roads, for controlling fire, and for controlling unwanted vegetation. Slope, drainage, texture, stoniness, and the presence of rocks and ledges are among the characteristics that affect the rating. Generally, the equipment limitation is slight if the slope is 12 percent or less and farm machinery can be operated efficiently without constructing and maintaining permanent roads and truck trails, or if wetness delays operations only 2 months or less. The rating is moderate if the slope is 12 to 30 percent, if the use of ordinary farm machinery is restricted, if track-type equipment is needed for efficient harvesting, and if wetness prevents the use of conventional logging vehicles for 2 to 6 months a year. The rating is severe if the slope is more than 30 percent, if track-type equipment is not adequate for harvesting, if power winches and other special equipment are needed, and if wetness prevents the use of vehicles for 6 months or more.

Unwanted trees, vines, shrubs, and other plants invade

a site when openings are made in the canopy. Competition from these invaders hinders the establishment and normal development of desirable seedlings, whether they occur naturally or are planted. Plant competition is slight if unwanted plants do not hamper desirable species by preventing adequate natural regeneration, by interfering with early growth, or by restricting the normal development of planted stock. Competition is moderate if unwanted plants delay establishment and hinder the growth of either planted stock or naturally regenerated seedlings of desired species. Competition is severe if unwanted plants prevent adequate restocking of the desired species (either by natural regeneration or by planting) without intensive preparation of the site or special maintenance.

If soil characteristics or topographic features are unfavorable, some loss of tree seedlings is to be expected, even if there is no competition from unwanted plants. Seedling mortality is slight if the expected loss is not more than 25 percent of the number of seedlings needed for optimum stocking. Seedling mortality is moderate if the expected loss is between 25 and 50 percent; and severe if the expected loss is more than 50 percent. If the rating is moderate or severe, replanting will probably be needed to insure a fully stocked stand of trees. Moreover, special preparation of the seedbed and special planting techniques are often needed.

Management by woodland groups

In the following pages the woodland groups in Nelson County are described. Unless a group contains only one soil, the soils are identified only by the name of the series. Listing of the series does not mean that all of the soils of that series are in the particular unit. The woodland group of any given soil can be found by referring to the "Guide to Mapping Units."

WOODLAND GROUP 1

This group consists of soils of the Baxter, Trimble, Crider, Elk, Hagerstown, Pembroke, Shelbyville, and Whitley series. These are nearly level to strongly sloping, well-drained soils on uplands. They are medium acid or strongly acid. The surface layer is loamy, and the subsoil is dominantly moderately fine textured. The potential productivity is high enough to justify intensive management.

Yellow-poplar, black walnut, white pine, white ash, black cherry, sugar maple, basswood, white oak, red oak, and black oak are the species to favor in existing stands. Black locust, yellow-poplar, black walnut, northern red oak, white ash, white pine, and shortleaf pine are the species to be preferred for planting.

The site index is 80 to 90 for mixed upland oaks, 85 to 95 for yellow-poplar, 75 to 85 for Virginia pine, and 35 to 45 for eastern redcedar. The approximate yearly growth in a 60-year rotation is 350 board feet per acre for mixed upland oaks, and about 440 board feet for yellow-poplar. The approximate yearly growth figures for Virginia pine and eastern redcedar have not been calculated.

The equipment limitation is slight on slopes of 12 percent or less and moderate on slopes of more than 12 percent.

Plant competition is moderate to severe. The amount of available moisture during the growing season encourages the growth of low-quality shade-tolerant trees in the understory of saw-log stands. After the stands have been cut, these low-quality trees prevent desirable trees from becoming reestablished unless the site is weeded.

Tree planting is ordinarily not feasible, because of the severe competition. Trees planted in open fields usually require cultivation. Interplanting ordinarily is not feasible because of the need for weeding.

The erosion hazard is slight on slopes of less than 12 percent and moderate on slopes of 12 to 20 percent. Roads and skid trails need to be well constructed and well maintained, especially if they are located where the slope is more than 12 percent.

Seedling mortality is slight.

WOODLAND GROUP 2

This group consists of slightly or moderately eroded soils of the Beasley, Corydon, Eden, Faywood, Lowell, Markland, Trappist, and Woolper series. These are gently sloping to strongly sloping, well-drained soils on uplands, foot slopes, and stream terraces. They are dominantly deep, and they originated from limestone or shale. The surface layer is loamy, and the subsoil is clayey. The potential productivity is high enough to justify management of medium intensity.

Black oak, white oak, red oak, Virginia pine, and redcedar are the species to favor in existing stands. Northern red oak, white ash, white pine, Virginia pine, and redcedar are the species to be preferred for planting.

The site index is 60 to 70 for mixed upland oaks, 65 to 75 for Virginia pine, and 30 to 40 for eastern redcedar. The approximate yearly growth is about 160 board feet per acre for mixed upland oaks.

The erosion hazard is slight on slopes of 12 percent and less, moderate on slopes of 12 to 20 percent, and severe on slopes of more than 20 percent. Roads and skid trails need to be well constructed and well maintained, especially if they are located on slopes of more than 12 percent.

The equipment limitation is moderate on slopes of 12 to 30 percent, and track-type equipment may be needed for efficient harvesting. The limitation is severe on Eden silty clay loam, 30 to 50 percent slopes, and winches may be needed for harvesting.

Plant competition is moderate. The amount of available moisture during the growing season encourages the growth of low-quality shade-tolerant trees in the understory of saw-log stands. After the stands have been cut, these low-quality trees prevent desirable trees from becoming reestablished unless the site is weeded. Interplanting or conversion planting is not feasible because of the need for weeding and other limitations.

Seedling mortality is slight.

WOODLAND GROUP 3

This group consists of severely eroded soils of the Beasley, Faywood, Hagerstown, Lowell, Markland, Pembroke, Trappist, and Trimble series. These are sloping to strongly sloping, well-drained soils on uplands and terraces. They are moderately deep to deep, and they are underlain by limestone or calcareous shale. The surface layer and the subsoil are moderately fine textured or fine textured. The potential productivity is high enough to justify management of medium to low intensity.

White oak, black oak, southern red oak, Virginia pine, white ash, and redcedar are the species to favor in existing stands. Virginia pine, shortleaf pine, white pine, loblolly pine, and redcedar are the species to be preferred for planting.

The site index is 40 to 50 for oaks, 60 to 70 for Virginia pine, and 35 to 45 for redcedar. The approximate yearly growth is about 50 board feet per acre for oaks.

The erosion hazard is slight to moderate. Roads and skid trails on the steeper slopes need to be well constructed and well maintained.

The equipment limitation is moderate on slopes of 12 percent or less and severe on slopes of more than 12 percent. Track-type equipment and power winches are often needed for efficient harvesting.

Seedling mortality is moderate to severe because of droughtiness, which in some years lasts for one or more weeks early in the growing season. These dry periods may cause moderate to severe losses of newly regenerated or planted trees.

Plant competition is slight.

WOODLAND GROUP 4

This group consists of soils of the Dunning, Lawrence, Melvin, Newark, and Robertsville series. These are level to nearly level, very poorly drained to somewhat poorly drained soils on flood plains, stream terraces, and uplands. The Lawrence and Robertsville soils have a fragipan at a depth of about 18 inches. All of the soils in the group are wet for long periods. The potential productivity for water-tolerant hardwoods is fair, except where flooding is frequent and of long duration. Yields of cottonwood, lowland oaks, and sweetgum are high enough to justify intensive management.

Cottonwood, lowland species of oak, sweetgum, yellow-poplar, white oak, and black oak are the species to favor in existing stands. Pin oak, sweetgum, cottonwood, and yellow-poplar are the species to be preferred for planting. All of these species can tolerate wet soil for long periods.

The site index is 95 to 105 for cottonwood and lowland oaks, 85 to 95 for sweetgum and yellow-poplar, and 65 to 75 for upland oaks. The approximate yearly growth is 510 board feet per acre for lowland oaks, 200 board feet for upland oaks (on Lawrence soils), and 440 board feet for yellow-poplar.

The equipment limitation is caused by wetness. It is moderate for the Lawrence and Newark soils, but it is severe for the other soils, which have a water table within 15 inches of the surface for more than 6 months of the year.

Plant competition is severe. An abundance of available moisture during the growing season encourages the growth of low-quality shade-tolerant trees in the understory of saw-log stands. After the stands have been cut, these low-quality trees prevent desirable trees from becoming reestablished unless the site is weeded intensively. Interplanting and conversion planting ordinarily are not feasible, because of the severe competition. Trees planted in open fields usually require cultivation.

The erosion hazard is slight, and seedling mortality is slight.

WOODLAND GROUP 5

This group consists of slightly to moderately eroded soils of the Bedford, Nicholson, Russellville, Tilsit, and Zanesville series. These are level to sloping, loamy, moderately well drained soils on uplands and terraces. They are moderately deep to a fragipan. The potential productivity is high enough to justify intensive management.

Yellow-poplar, white oak, northern red oak, black oak, white ash, sugar maple, black walnut, and black cherry are the species to favor in existing stands. Black locust, black walnut, northern red oak, white ash, yellow-poplar, white pine, and shortleaf pine are the species to be preferred for planting.

The site index is 70 to 80 for upland oaks, 90 to 100 for yellow-poplar, 65 to 75 for Virginia pine, and 80 to 90 for sweetgum. The approximate yearly growth is 240 board feet per acre for oaks and 500 board feet for yellow-poplar.

Plant competition is moderate. The amount of available moisture during the growing season encourages the growth of low-quality shade-tolerant trees in the understory of saw-log stands. After the stands have been cut, these low-quality trees often prevent desirable trees from becoming reestablished unless the site is weeded. Trees planted in open fields may require cultivation or weeding.

The erosion hazard, the equipment limitation, and the seedling mortality are slight.

WOODLAND GROUP 6

This group consists of soils of the Huntington and Lindside series. These are deep, well-drained soils on flood plains. They are mostly loamy but in some places are gravelly. The reaction is slightly acid to neutral. The potential productivity is high enough to justify intensive management.

Lowland oaks, cottonwood, sweetgum, yellow-poplar, and black walnut are the species to favor in existing stands. Sweetgum, cottonwood, loblolly pine, and white pine are the species to be preferred for planting. A few areas of these soils are flooded during the growing season and are not well suited to black walnut, yellow-poplar, and upland oaks.

The site index is 90 to 100 for pin oak, 100 to 120 for cottonwood, 90 to 100 for sweetgum, and 100 to 110 for yellow-poplar. The approximate yearly growth is 455 board feet for oaks and about 600 board feet for yellow-poplar.

Plant competition is severe. The amount of available moisture during the growing season encourages the growth of low-quality shade-tolerant trees in the understory of saw-log stands. After the stands have been cut, these low-quality trees prevent desirable trees from becoming reestablished unless the site is weeded intensively. Trees planted in open fields require cultivation. Interplanting or conversion planting ordinarily is not feasible, because of the severe competition.

The erosion hazard, the equipment limitation, and the seedling mortality are slight.

WOODLAND GROUP 7

This group consists of soils of the Corydon, Fairmount, and Otway series. These are sloping to moderately steep, somewhat excessively drained soils on uplands. They are

dominantly shallow to moderately deep. The reaction is neutral to alkaline. The surface layer is fine textured, and the subsoil is clayey. The potential productivity is high enough to justify management of medium intensity.

Redcedar, black oak, white ash, and southern red oak are the species to favor in existing stands. Redcedar, Virginia pine, and white ash are the species to be preferred for planting.

The site index is 55 to 65 for oaks and 35 to 45 for redcedar. The approximate yearly growth is 120 board feet per acre for oaks.

The erosion hazard is slight on slopes of up to 12 percent, moderate on slopes of 12 to 20 percent, and severe on slopes of more than 20 percent. Gullies form readily where water concentrates. Roads and skid trails need to be well constructed and well maintained.

The equipment limitation is moderate on slopes of 12 percent or less and severe on slopes of more than 12 percent. Track-type equipment is needed for efficient harvesting.

Seedling mortality is moderate on slopes of up to 30 percent and severe on slopes of more than 30 percent because of the effects of 2- to 3-week dry periods that occur in the early part of the growing season.

Plant competition is slight.

WOODLAND GROUP 8

This group consists of severely eroded soils of the Colyer, Corydon, Eden, Fairmount, Rockcastle, Shrouts, and Otway series. These are sloping to steep, shallow, droughty soils on uplands. Some places are flaggy or very rocky. The potential productivity justifies only a minimum intensity of management.

Redcedar, southern red oak, and post oak are the species to favor in existing stands. Redcedar and Virginia pine are the species to be preferred for planting.

The site index is 40 to 50 for oaks and 30 to 40 for redcedar. The approximate yearly growth is 50 board feet per acre for the oaks.

The erosion hazard is slight on slopes of up to 20 percent, moderate on slopes of 20 to 30 percent, and severe on steeper slopes. The location, construction, and maintenance of roads and skid trails need to be carefully considered.

The equipment limitation is moderate on slopes of up to 12 percent because of some rockiness and because of the clayey surface layer. It is severe on slopes of 12 to 50 percent because of the steepness and the clay surface layer.

Seedling mortality is moderate to severe, because of the droughtiness. Dry periods of 2 to 3 weeks duration occur during the growing season.

Plant competition is slight.

WOODLAND GROUP 9

This group consists of soils of the Colyer, Rockcastle, and Weikert series. These are sloping to steep, somewhat excessively drained soils on uplands. They are shallow and are underlain by acid siltstone or acid shale. They are very strongly acid. The surface layer is loamy, and the subsoil is loamy or clayey. The productivity is high enough to justify moderately intensive management.

The site index is 55 to 65 for oaks, and 55 to 65 for shortleaf pine. The approximate yearly growth is 120 board feet per acre for oaks.

The erosion hazard is slight on slopes of 6 to 12 percent, moderate on slopes of 12 to 20 percent, and severe on slopes of more than 20 percent. Roads and skid trails need to be well constructed and well maintained.

The equipment limitation is slight on slopes of less than 12 percent, moderate on slopes of 12 to 20 percent, and severe on slopes of more than 20 percent. Track-type equipment and winches are needed to harvest efficiently on steep slopes.

Seedling mortality is moderate to severe, mainly because of the effects of 2- to 3-week dry periods that occur in the early part of some growing seasons. Careful onsite determinations are needed before trees are planted.

Plant competition is slight.

WOODLAND GROUP 10

This group consists only of McGary silt loam, a somewhat poorly drained soil on stream terraces. This soil formed in alkaline, slack-water sediment, and it has a clayey, very plastic subsoil that is alkaline in the lower part. The potential productivity is fair for oaks, and moderately intensive management is justifiable.

Shumard oak, black oak, and southern red oak are the species to favor in existing stands. Post oak is common in existing stands, but it has a low site index. Red oak is the only species suitable for planting.

The site index is 65 to 75 for upland oaks. The approximate yearly growth is 200 board feet per acre for oaks.

The equipment limitation is moderate because of a high water table late in winter and early in spring.

Plant competition is moderate to severe. An abundance of available moisture during the growing season encourages the growth of low-quality shade-tolerant trees in the understory of saw-log stands. After the stands have been cut, these low-quality trees prevent desirable trees from becoming reestablished unless the site is weeded. Interplanting ordinarily is not feasible. Plant competition is severe in open fields that have been idle for more than 2 years.

The erosion hazard and seedling mortality are slight.

WOODLAND GROUP 11

This group consists of Gullied land, acid shaly materials; Gullied land, calcareous shaly materials; and the Rock land part of the Rock land-Corydon complex.

Rock land is 25 to 90 percent outcrops. The soil between the outcrops is shallow and fine textured. Slopes vary in gradient. The potential productivity is so low that management is hardly justified. These areas support sparse mixed stands of redcedar, oak, and hickory, but growth is slow and quality is poor to fair. Where there is enough soil available, Virginia pine and white pine can be planted. They help to control erosion, they improve the wildlife habitat, and they have esthetic value.

Gullied land is more than 50 percent moderately deep to deep gullies. The potential productivity is very low for most species. Where the soil material is acid, shortleaf pine, loblolly pine, and Virginia pine will grow, but slowly. These furnish some protection against erosion, improve the wildlife habitat, and have esthetic value.

In strongly calcareous areas only redcedar and Virginia pine will grow, and they grow very slowly.

Plant competition varies in severity. All other limitations and hazards are severe.

Wildlife

Food, cover, and water are the essentials of wildlife habitat. Habitat can be created, maintained, or improved by planting suitable vegetation, by maintaining the present vegetation, by creating and improving water areas, or by combinations of these practices.

The principal kinds of wildlife in Nelson County are cottontail rabbits, gray squirrels, opossums, muskrats, songbirds, insectivorous birds, fox squirrels, bobwhite quail, mourning doves, white-tailed deer, skunks, mink, red fox, gray fox, and nongame mammals. Ducks are now scarce. The streams contain various warm-water fish that are common throughout the State: for example, bluegill, largemouth bass, and bullhead. Bullhead outnumber other kinds of fish in the streams, but largemouth bass and bluegill outnumber bullhead in the farm ponds.

In table 3 the soils of Nelson County are rated as to relative suitability for the creation, improvement, or maintenance of eight elements of wildlife habitat and as to relative capacity for supporting wildlife of three general kinds. The ratings are based on limitations imposed by the characteristics or behavior of the soil. They do not reflect economic and sociological influences.

TABLE 3.—*Ratings of soils for elements of wildlife habitat and kinds of wildlife*

Soil series and mapping unit symbols	Elements of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwoods	Conifers	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Baxter: BaD	3	1	1	1	3	4	4	4	1	1	4
Beasley:											
BeB, BeC2	2	1	1	1	3	4	4	4	1	1	4
BeD2	3	1	1	1	3	4	4	4	1	1	4
BlC3	3	2	1	1	3	4	4	4	2	2	4
BlD3	4	2	1	1	3	4	4	4	2	2	4
Bedford:											
BrA	2	1	1	1	3	3	3	3	1	1	3
BrB, BrC2	2	1	1	1	3	4	4	4	1	2	4
Colyer:											
ChD	3	3	2	2	2	4	4	4	3	2	4
ClE3, CmF	4	4	2	2	2	4	4	4	3	3	4
Corydon:											
CnB, CnC2	3	2	2	2	2	4	4	4	2	2	4
CnD2, CoD3	4	2	2	2	2	4	4	4	3	2	4
CrD2	4	3	2	2	2	4	4	4	3	2	4
CsE3	4	3	3	2	1	4	4	4	3	2	4
Crider: CtC	2	1	1	1	3	4	4	4	1	1	4
Dunning: Du	4	3	3	1	1	1	2	4	3	1	2
Eden:											
EeC3	2	2	1	1	2	4	4	4	1	1	4
EcF2, EeE3, EfE3, EfF3	4	3	1	1	2	4	4		3	1	4
Elk:											
EkA	1	1	1	1	3	4	4	4	1	1	4
EkB, EkC	2	1	1	1	3	4	4	4	1	1	4
Fairmount:											
FaD, FfE	4	3	2	2	2	4	4	4	3	2	4
FmD3, FmF3	4	3	3	3	1	4	4	4	3	2	4
Faywood:											
FwC2	2	1	1	1	3	4	4	4	1	1	4
FwD2	3	2	1	1	3	4	4	4	2	2	4
FyD3	4	3	2	2	2	4	4	4	3	2	4
Gullied land: Ga, Gc	4	4	2	2	2	4	4	4	4	2	4

TABLE 3.—*Ratings of soils for elements of wildlife habitat and kinds of wildlife*—Continued

Soil series and mapping unit symbols	Elements of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwoods	Conifers	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Hagerstown:											
HaB, HaC	2	1	1	1	3	4	4	4	1	1	4
HgD3	4	3	1	1	3	4	4	4	3	2	4
Huntington: HuA, HuC, Hv	2	1	1	3	3	4	4	4	1	1	4
Lawrence: Lc	3	3	2	2	2	2	2	2	3	2	2
Lindside: Ld	2	1	1	1	3	3	3	4	1	1	3
Lowell:											
LwB, LwC2	2	1	1	1	3	4	4	4	1	1	4
LwD2	3	2	2	1	3	4	4	4	2	1	4
LyC3	3	2	2	1	3	4	4	4	2	2	4
LyD3	4	2	2	1	3	4	4	4	3	2	4
Markland:											
MkC	2	1	1	1	2	4	4	4	1	1	4
MkD2	3	2	1	1	2	4	4	4	2	1	4
MlC3	3	2	1	1	2	4	4	4	2	1	4
MlD3	4	3	1	1	2	4	4	4	3	2	4
McGary: Mr	2	2	1	1	3	2	2	2	1	1	2
Melvin: Mt	4	3	2	1	2	1	2	4	3	1	2
Newark: Ne	3	3	3	1	3	3	2	3	3	2	3
Nicholson: NhB	2	1	1	1	3	4	4	4	1	1	4
Otway:											
OtC	3	2	2	3	2	4	4	4	2	3	4
OtE	4	2	2	3	2	4	4	4	3	3	4
Pembroke:											
PbA	1	1	1	1	3	4	4	4	1	1	4
PbB, PbC	2	1	1	1	3	4	4	4	1	1	4
PeC3	3	2	1	1	3	4	4	4	2	2	4
Robertsville: Rb	3	3	2	2	2	3	1	1	3	2	2
Rockcastle:											
RcD	4	2	2	2	2	4	4	4	3	2	4
RcF, RlF, RkE3	4	4	2	3	2	4	4	4	4	3	4
For Weikert part of RlF, see Weikert series.											
Rock land: Ro	4	4	3	3	1	4	4	4	4	3	4
For Corydon part of Ro, see CsE3.											
Russellville:											
RuA	2	1	1	1	3	3	3	3	1	1	3
RuB	2	1	1	1	3	4	4	4	1	1	4
Shelbyville: ShB	2	1	1	1	3	4	4	4	1	1	4
Shrouts:											
SoC, SoE	4	3	2	2	2	4	4	4	3	2	4
For Otway part of SoC, see Otway series, OtC. For Otway part of SoE, see Otway series, OtE.											

TABLE 3.—*Ratings of soils for elements of wildlife habitat and kinds of wildlife*—Continued

Soil series and mapping unit symbols	Elements of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwoods	Conifers	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Tilsit: TIB, TIC2	2	1	1	1	3	4	4	4	1	1	4
Trappist:											
TpB, TpB2, TpC, TpC2	2	1	1	1	3	4	4	4	1	1	4
TpD, TpD2	3	2	1	1	3	4	4	4	2	2	4
TrC3	3	2	2	2	2	4	4	4	2	2	4
TrD3	4	3	2	2	2	4	4	4	3	2	4
Trimble:											
TsB, TsC	2	1	1	1	3	4	4	4	1	1	4
TsD	3	2	1	1	3	4	4	4	2	2	4
TtD3	4	3	1	1	3	4	4	4	3	2	4
Weikert	4	4	2	3	2	4	4	4	4	3	4
Whitley:											
WhB, WhC	2	1	1	1	3	4	4	4	1	1	4
WhD	3	2	1	1	3	4	4	4	2	2	4
Woolper:											
WoB, WoC	2	1	1	1	3	4	4	4	1	1	4
WoD2	3	2	1	1	3	4	4	4	2	2	4
Zanesville: ZaB, ZaC2	2	1	1	1	3	4	4	4	1	1	4

A rating of 1 means well suited. Habitat generally is easily created, improved, or maintained. There are few or no soil limitations, and satisfactory results are probable.

A rating of 2 means suited. Habitat usually can be created, improved, or maintained, but there are moderate soil limitations that affect management of habitat. Moderate intensity of management and fairly frequent attention will bring satisfactory results.

A rating of 3 means poorly suited. Although habitat can be created, improved, or maintained in most places, the limitations are rather severe. Management is difficult and expensive, and it may require intensive effort. Results are not always satisfactory.

A rating of 4 means unsuited. It is impractical or impossible to create, improve, or maintain wildlife habitat; unsatisfactory results are probable.

The six groups of plants and two kinds of water developments for which the soils are rated in table 3 are as follows:

Grain and seed crops are agricultural grains and seed-producing annuals that provide food. Examples are corn, sorghum, wheat, oats, millet, buckwheat, soybeans, and sunflowers.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are established by planting and that furnish food and cover. Examples are fescue, bromegrass, bluegrass, timothy, redtop, orchardgrass, reed canarygrass, clover, trefoil, alfalfa, and panicgrass.

Wild herbaceous upland plants are native or introduced perennial grasses and forbs that become established naturally on uplands and that provide food and cover. Examples are bluestem, indiangrass, wheatgrass, wild ryegrass, oatgrass, pokeweed, strawberries, lespedeza, beggarweed, wild beans, nightshade, goldenrod, and dandelions.

Hardwoods are nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, catkins, samaras, twigs (browse), or foliage; that become established either naturally or by planting; and that can be used extensively as food. Examples are oak, beech, cherry, hawthorn, dogwood, viburnum, maple, birch, poplar, grape, honeysuckle, blueberry, brier, greenbrier, autumn olive, and multiflora rose.

Conifers are cone-bearing trees and shrubs that become established naturally or by planting. They are important mainly as cover but may furnish food in the form of browse, seeds, or fruitlike cones. Examples are spruce, pine, white-cedar, hemlock, redcedar, juniper, and yew.

Several factors are involved in rating the suitability of the soils for conifers. Coniferous habitat harbors larger numbers and more kinds of wildlife if growth and canopy closure are slow than if growth and canopy closure are rapid. Therefore, soil properties that promote growth are classed as limitations because they generally necessitate intensive management to establish satisfactory, long-lasting habitat.

Wetland food and cover plants are annual and perennial wild herbaceous plants that grow in moist to wet sites. Examples are smartweed, wild millet, bulrush,

spikesedge, rushes, sedges, burreeds, wildrice, rice cutgrass, and cattails. Submerged and floating aquatics are not included.

Shallow water developments are impoundments or excavations in which the depth of the water generally does not exceed 6 feet. Examples are low dikes and levees, shallow dugouts, level ditches, and devices for water-level control in marshy drainageways or channels.

Excavated ponds are dug-out areas or combination dug-out and dammed areas that have water of suitable quality, of adequate depth, and of ample quantity to provide an environment favorable for fish and wetland wildlife. Such ponds need to have a surface area of at least a quarter of an acre, an average depth of 6 feet over at least a fourth of the area, and a dependable source of water.

The three general classes of wildlife for which the soils are rated in table 3 are defined as follows:

Openland wildlife includes birds and mammals that normally make their homes on cropland, pastures, meadows, lawns, and areas overgrown with grasses, herbs, and shrubby plants. Examples are quail, meadow larks, field sparrows, doves, cottontail rabbits, red foxes, and woodchucks.

Woodland wildlife includes birds and mammals that normally make their homes in areas wooded with hardwoods and shrubs, coniferous trees and shrubs, or a mixture of both. Examples are ruffed grouse, woodcock, thrushes, vireos, scarlet tanagers, gray squirrels, gray fox, white-tailed deer, raccoon, and wild turkey.

Wetland wildlife includes birds and mammals that normally make their homes in ponds, marshes, or swamps. Examples are ducks, geese, herons, shore birds, mink, muskrat, and beaver.

Engineering Uses of the Soils [4]

This section provides information of special interest to engineers, contractors, farmers, and others who use soil as structural material or as foundation material upon which structures are built. In it are described those soil properties that affect construction and maintenance of roads and airports, pipelines, building foundations, water storage facilities, erosion control structures, drainage systems, and sewage disposal systems. Among the properties most important to engineers are permeability, shear strength, density, shrink-swell potential, water-holding capacity, grain-size distribution, plasticity, and reaction.

Information concerning these and related soil properties is furnished in tables 4, 5, and 6. The estimates and interpretations of soil properties in these tables can be used in—

1. Planning and designing agricultural drainage systems, farm ponds, irrigation systems, diversion terraces, and other structures for controlling water and conserving soil.
2. Selecting locations for highways, airports, pipelines, and underground cables.
3. Selecting areas for industrial, commercial, residential, and recreational development.

With the soil map for identification, the engineering interpretations reported here can be used for many purposes. In addition, sampling and testing should be done where engineering works involve heavy loads and excavations to depths greater than those shown in the tables. The soil map is useful for planning further investigations and for indicating the nature of future problems.

Some words that soil scientists use may be unfamiliar to engineers, and others may have different meanings in soil science than they have in engineering. Gravel, sand, silt, clay, surface soil, subsoil, and horizon are examples. These are defined in the Glossary at the end of the survey.

Engineering Classification Systems

The two systems most commonly used in classifying soils for engineering are the one developed by the American Association of State Highway Officials (AASHO) (*1*, *9*) and the Unified system (*9*, *18*) developed for the Corps of Engineers and used by SCS engineers, Department of Defense engineers, and others.

Under the AASHO system, soil materials are classified according to properties that affect their use in highway construction. Soils are classified in seven basic groups, 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, and in group A–7 are clay soils that have low strength when wet. The best soils for subgrade are classified as A–1, the next best as A–2, and so on to class A–7, the poorest soils for subgrade. If laboratory data are available to justify a further breakdown, the A–1, A–2, and A–7 groups are divided as follows: A–1–a, A–1–b; A–2–4, A–2–5, A–2–6, A–2–7; and A–7–5, A–7–6.

The relative engineering value of the soils within each group can be indicated by group index numbers, which range from 0 for the best material to 20 for the poorest. Group indexes can be established only if laboratory data is available.

Under the Unified system, soils are classified according to particle-size distribution, plasticity, liquid limit, and organic matter. Soil materials are classified in 15 groups. There are eight classes of coarse-grained soils, identified by the symbols GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified by the symbols ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified by the symbol Pt.

The AASHO and Unified classifications of tested soils are shown in table 4. The estimated classifications of all the soils of the county according to both systems are shown in table 5.

Engineering Test Data

Table 4 gives engineering test data for samples of some of the major soil types in Nelson County. The table shows where samples were taken, the depth of sampling, and the results of tests made to determine particle-size distribution, moisture-density relations, and liquid and plastic limits.

[4] This section was prepared by J. R. DAVIS, assistant State conservation engineer, in collaboration with E. V. HUFFMAN, assistant State soil scientist, Soil Conservation Service.

373-720—71——5

TABLE 4.—*Engineering*

[Tests made by Kentucky Department of Highways Research Laboratory, Lexington, in cooperation with the Bureau of

Soil name and location of sample	Parent material	Depth from surface	Moisture-density data [1]		Mechanical analysis [2]		
			Maximum dry density	Optimum moisture	Percentage passing sieve—		
					⅜ in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)
Huntington silt loam:		*In.*	*Lb./cu. ft.*	*Pct.*			
200 feet NW. of Beech Fork bridge on Ky. Highway No. 49. Modal profile.	Limestone.	0–9	101	20	----------	----------	100
		9–31	105	19	----------	----------	100
200 yards E. of Ky. Highway No. 52, and S. of central Ky. Turnpike overpass. Modal profile.	Limestone.	0–7	98	20	----------	----------	100
		11–18	104	18	----------	----------	100
		24–46	97	21	----------	----------	100
		46–60	102	22	----------	----------	100
Lowell silt loam:							
On Ky. Highway No. 55 and ½ mile S. of junction of U.S. Highway No. 62. Modal profile.	Limestone.	0–8	108	20	----------	----------	100
		15–27	98	24	----------	100	99
		36–57	99	19	----------	----------	100
On Ky. Highway No. 1066, 100 yards E. of drive to Snyder Chowing farm. Nonmodal profile: less clay content in B horizon.	Thin-bedded limestone, siltstone, and shale.	0–7	100	18	----------	----------	100
		19–25	93	25	----------	----------	100
		37–50	101	20	----------	----------	100
Newark silt loam:							
200 feet N. of Pottinger Creek and 20 feet W. of Highway No. 247. Modal profile.	Alluvium, chiefly from limestone.	0–12	104	18	----------	----------	100
		24–38	107	19	----------	----------	98
1¼ miles S. of Howardstown and 700 feet W. of gravel road. Nonmodal profile: more plastic in C2g horizon.	Alluvium, chiefly from limestone.	0–11	98	19	----------	----------	100
		22–32	102	18	----------	----------	100
Otway silty clay loam:							
On gravel road, ¾ mile E. of Beech Fork bridge on Ky. Highway No. 49. Modal profile.	Soft calcareous shale.	0–9	89	27	----------	----------	100
		17–30	108	19	----------	----------	100
1 mile W. of Balltown at an old road. Nonmodal profile: coarser textured below surface layer than in the modal profile; no B horizon.	Calcareous shale.	0–7	102	18	100	99	98
		13–40	113	15	----------	----------	100
Pembroke silt loam:							
3 miles E. of Bardstown on Woodlawn Road. Modal profile.	Loess and Silurian limestone.	0–8	95	21	----------	----------	100
		26–33	104	19	----------	----------	100
		40–76	101	22	----------	----------	100
2½ miles E. of Bardstown, 100 yards W. and 150 yards N. of intersection of Bluegrass Parkway and U.S. Highway No. 150. Nonmodal profile; thin solum over very plastic clay.	Loess and Silurian limestone.	0–7	98	22	----------	100	99
		20–33	100	22	----------	----------	100
		42–93	95	30	----------	----------	100
Rockcastle silt loam:							
2 miles N. of New Hope on Ky. Highway No. 457. Modal profile.	Gray, acid shale.	3–7	102	22	----------	----------	100
		7–15	101	19	----------	----------	100
2 miles N. of New Haven on U.S. Highway 31–E. Nonmodal profile: less clay content in B horizon.	Gray, acid shale.	1–8	98	21	----------	----------	100
		11–27	107	19	[5] 98	97	95

See footnotes at end of table.

test data

Public Roads, in accordance with standard procedures of the American Association of State Highway Officials (AASHO).

Mechanical analysis [2]—Continued							Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Con.			Percentage smaller than—						AASHO [3]	Unified [4]
No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
							Pct.			
99	98	86	71	39	19	11				
99	99	98	95	70	20	10	30	8	A-4(8)	ML-CL
94	93	92	90	76	32	19	30	4	A-4(8)	ML
99	98	97	96	86	46	32	28	8	A-4(8)	CL
99	98	96	95	84	55	45	40	18	A-6(11)	CL
99	98	97	97	80	38	28	35	14	A-6(10)	CL
96	95	93	89	71	28	17	33	7	A-4(8)	ML-CL
94	93	90	90	86	65	55	48	23	A-7-6(15)	ML-CL
99	99	97	95	86	59	50	58	30	A-7-6(20)	MH-CH
96	95	94	94	75	41	32	31	9	A-4(8)	ML-CL
99	98	97	96	90	70	58	46	17	A-7-6(12)	ML-CL
99	98	96	94	86	57	44	43	17	A-7-6(12)	ML-CL
96	95	92	91	77	28	12	33	9	A-4(8)	ML-CL
95	23	85	80	61	31	21	33	9	A-4(8)	ML-CL
99	98	94	91	60	28	14	34	8	A-4(8)	ML-CL
98	96	94	93	82	42	26	33	8	A-4(8)	ML-CL
98	98	93	88	70	44	31	50	20	A-7-5(14)	MH-CH
97	96	92	90	79	56	44	50	24	A-7-6(16)	MH-CH
97	97	96	92	56	30	25	30	6	A-4(8)	ML-CL
94	92	90	86	67	34	25	34	13	A-6(9)	CL
99	99	98	93	70	28	16	33	10	A-4(8)	ML-CL
96	95	92	90	71	41	30	36	18	A-6(11)	CL
95	94	93	92	81	49	40	44	9	A-5(9)	ML
98	97	95	90	64	30	20	30	8	A-4(8)	ML-CL
94	93	91	91	80	48	39	44	18	A-7-6(12)	ML-CL
97	96	92	88	84	73	66	88	50	A-7-5(20)	MH-CH
99	98	91	90	79	40	26	39	13	A-6(9)	ML-CL
99	99	99	99	95	62	40	53	25	A-7-6(17)	MH-CH
97	94	84	79	47	17	8	29	4	A-4(8)	ML-CL
94	94	89	79	54	32	21	32	5	A-4(8)	ML

TABLE 4.—*Engineering*

Soil name and location of sample	Parent material	Depth from surface	Moisture-density data [1]		Mechanical analysis [2]		
			Maximum dry density	Optimum moisture	Percentage passing sieve—		
					⅜ in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)
		In.	*Lb./cu. ft.*	*Pct.*			
Shelbyville silt loam:							
2 miles SE. of junction of U.S. Highway No. 62 and Ky. Highway No. 55 on gravel road. Modal profile.	Loess and limestone.	0–8	97	21	----------	----------	100
		12–21	107	19	----------	----------	100
		29–37	104	21	100	99	98
		37–68	94	27	----------	100	96
8 miles E. of Bardstown on U.S. Highway No. 62. Monmodal profile: low clay content in B2 horizon.	Loess and thin-bedded limestone.	0–10	101	17	----------	----------	100
		15–25	104	19	----------	----------	100
		32–72	94	26	100	99	99
Tilsit silt loam:							
On gravel road, ¾ mile N. of Melody Lake. Modal profile.	Loess and black acid shale.	0–8	95	21	----------	----------	100
		13–25	103	20	----------	----------	100
		25–34	102	22	100	99	98
1 mile NW. of Spooky Hollow Lake. Nonmodal profile: low clay content in Bx horizon.	Loess and fine-grained sandstone.	0–8	100	18	----------	----------	100
		11–23	100	21	----------	----------	100
		23–36	102	19	----------	----------	100
		36–44	108	14	[6] 98	96	92
Trappist silt loam:							
N. of Harrison Fork Road and 1 mile S. of junction with Ky. Highway No. 245. Modal profile.	Acid shale.	1–7	102	18	----------	----------	100
		11–25	104	20	----------	100	98
		32–38	101	24	----------	----------	100
1¾ miles N. of New Haven on U.S. Highway No. 31–E. Nonmodal profile: chert in surface layer.	Acid shale.	1–7	105	18	[7] 94	92	91
		13–27	103	21	----------	----------	100
		36–49	105	20	[8] 98	94	91
Trimble cherty silt loam:							
¼ mile S. of Nelsonville on Ky. Highway No. 52. Modal profile.	Alluvium from cherty limestone.	0–6	100	16	----------	----------	96
		17–27	103	21	[9] 92	91	90
		37–108	101	21	[10] 81	76	74
1½ miles E. of Ky. Highway No. 52 on Stillwell Road. Nonmodal profile: thin solum over shale.	Cherty alluvium over Devonian black shale.	0–5	101	19	----------	----------	----------
		8–16	105	21	[11] 63	59	58
		24–35	100	23	----------	----------	96

[1] Based on AASHO Designation: T 99–57 (*1*).

[2] Mechanical analysis according to AASHO Designation: T 88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

[3] Based on AASHO Designation M 145–49 (*1*).

[4] SCS and BPR have agreed that any soil having a plasticity

test data—Continued

Mechanical analysis [2]—Continued							Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Con.			Percentage smaller than—						AASHO [3]	Unified [4]
No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
							Pct.			
95	94	90	87	64	30	19	27	4	A-4(8)	ML-CL
96	95	93	90	76	40	32	37	15	A-6(10)	ML-CL
91	89	87	86	71	46	37	40	18	A-6(11)	CL
92	91	89	87	80	62	55	60	30	A-7-5(20)	MH-CH
95	94	88	84	63	25	16	26	4	A-4(8)	ML-CL
94	92	89	84	66	36	28	32	11	A-6(8)	ML-CL
95	94	91	89	79	61	54	72	40	A-7-5(20)	MH-CH
95	94	89	85	70	27	15	28	5	A-4(8)	ML-CL
96	95	94	91	79	35	30	38	15	A-6(10)	ML-CL
95	94	93	92	84	52	37	38	15	A-6(10)	ML-CL
99	98	96	92	77	29	21	24	1	A-4(8)	ML
99	99	99	95	74	26	28	35	14	A-6(9)	CL
98	98	96	94	66	30	22	32	10	A-4(8)	ML-CL
90	90	88	77	56	26	18	26	6	A-4(8)	ML-CL
98	97	84	75	48	18	13	24	5	A-4(8)	ML-CL
95	94	92	90	72	42	34	37	14	A-6(10)	ML-CL
97	96	94	93	89	60	45	44	17	A-7-6(11)	ML-CL
90	89	84	79	50	19	9	28	5	A-4(8)	ML-CL
98	98	97	95	84	47	38	37	16	A-6(11)	CL
							32	4		
91	87	75	70	39	16	11				
87	84	74	69	54	35	29	43	17	A-7-6(11)	ML-CL
68	66	55	50	38	25	21	44	20	A-7-6(9)	ML-CL
							28	8		
54	53	44	42	32	18	15	36	13	A-6(3)	GM-GC
88	85	76	68	50	33	27	41	16	A-7-6(11)	ML-CL

index within two points of the A-line is to be given a borderline classification. An example of a borderline classification so obtained is ML–CL.

[5] 99 percent passed the 1-inch sieve.

[6] 100 percent passed the 1-inch sieve; 99 percent passed the ¾-inch sieve.

[7] 98 percent passed the 1-inch sieve.

[8] 100 percent passed the 1-inch sieve.

[9] 95 percent passed the 1-inch sieve; 94 percent passed the ¾-inch sieve.

[10] 99 percent passed the 1-inch sieve; 95 percent passed the ¾-inch sieve.

[11] 77 percent passed the 1-inch sieve; 72 percent passed the ¾-inch sieve.

TABLE 5.—*Estimated engineering*

Soil series and map symbols	Depth to—		Depth from surface (typical profile)	Classification		
	Bedrock	Seasonal high water table		USDA texture	Unified [1]	AASHO [1]
	Feet	*Feet*	*Inches*			
Baxter: BaD	5–8	6+	0–7	Cherty silt loam	ML or CL	A–4
			7–10	Cherty silty clay loam	CL	A–6 or A–7
			10–60	Cherty silty clay	MH or CH	A–7
Beasley: BeB, BeC2, BeD2, BIC3, BID3.	3½–5	6+	0–5	Silt loam	ML or ML–CL	A–4 or A–6
			5–13	Silty clay loam	CL or CH	A–7 or A–6
			13–33	Silty clay to clay	MH or CH	A–7
			33–45	Clay	MH or CH	A–7
			45–53	Shale.		
Bedford: BrA, BrB, BrC2	5–10	1½–2	0–23	Silt loam to silty clay loam	ML or CL	A–4 or A–6
			23–37	Silt loam (fragipan)	ML or CL	A–4 or A–6
			37–90	Silt loam or silty clay loam	ML or CL	A–6 or A–7
Colyer: ChD, ClE3, CmF	½–1½	6+	0–7	Silt loam	ML	A–4
			7–16	Silty clay loam	ML, MH or GC	A–7
			16	Shale.		
Corydon: CnB, CnC2, CnD2, CoD3, CrD2, CsE3.	1–3	6+	0–5	Silt loam	ML or CL	A–4 or A–6
			5–20	Silty clay	CL or CH	A–7 or A–6
			20	Limestone.		
Crider: CtC	5–8	6+	0–13	Silt loam	ML or ML–CL	A–4
			13–60	Silty clay loam	CL or MH–CH	A–6 or A–7
Dunning: Du	4–10	[2] 0–½	0–23	Silty clay loam	ML or CL	A–6
			23–50	Silty clay to clay	CL or CH	A–7
Eden: EcF2, EeC3, EeE3, EfE3, EfF3.	6–10	6+	0–14	Silty clay loam to clay	MH, CH or CL	A–6 or A–7
			14–72	Clay to silty clay loam	CH, MH, CL	A–7
			72	Limestone and shale.		
Elk: EkA, EkB, EkC	4–9	6+	0–16	Silt loam	ML	A–4
			16–54	Silty clay loam	ML or CL	A–4 or A–6
Fairmount: FaD, FfE, FmD3, FmF3	½–2	6+	0–7	Silty clay loam	CL	A–7
			7–18	Clay	CH	A–7
			18	Limestone.		
Faywood: FwC2, FwD2, FyD3	2–3	6+	0–5	Silty clay loam	ML or CL	A–4 or A–6
			5–26	Silty clay	CL or CH	A–7
			26–32	Silty clay	CH	A–7
			32	Limestone.		
Gullied land: Ga, Gc. No estimates; all properties variable.	1–6	6+				
Hagerstown: HaB, HaC, HgD3	5–8	6+	0–7	Silt loam	ML or CL	A–6
			7–12	Silty clay loam	CL	A–7
			12–68	Silty clay	MH or MH–CH	A–7
Huntington: HuA, HuC	4–10	[2] 5+	0–18	Silt loam	ML or ML–CL	A–4
			18–45	Silt loam	CL or ML–CL	A–6 or A–4
Huntington, gravelly variant: Hv	4–8	[2] 5+	0–21	Gravelly silt loam	ML or SM	A–4
			21–40	Dominantly gravelly material.	GM	A–4 or A–2
Lawrence: Lc	5–10	[3] ½–1½	0–18	Silt loam	ML or CL	A–4
			18–49	Silty clay loam (fragipan)	CL or ML–CL	A–6 or A–4
			49–60	Silt loam	ML–CL	A–6

See footnotes at end of table.

properties of the soils

Percentage passing sieve —				Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity	
No. 4	No. 10	No. 40	No. 200					Uncoated steel	Concrete
				Inches per hour	*Inches per inch of soil*	*pH*			
75–90	70–90	65–90	65–85	0. 63–2. 00	0. 15–0. 18	5. 1–5. 5	Low	Low	Moderate.
80–95	75–95	70–95	65–90	0. 63–2. 00	0. 12–0. 15	4. 5–5. 0	Moderate	Moderate	High.
75–90	70–90	65–90	60–90	0. 63–2. 00	0. 10–0. 13	4. 5–5. 0	Moderate	Moderate to high	High.
95–100	95–100	90–100	85–95	0. 63–2. 00	0. 19–0. 23	4. 5–5. 0	Low	Low	High.
95–100	95–100	90–100	85–95	0. 63–2. 00	0. 16–0. 19	5. 1–5. 5	Moderate	Moderate	Moderate.
95–100	95–100	95–100	90–95	0. 20–0. 63	0. 14–0. 18	5. 1–5. 5	Moderate	High	Moderate.
85–100	80–100	80–100	75–95	0. 20–0. 63	0. 14–0. 17	7. 5–8. 0	Moderate	Low	Low.
95–100	95–100	90–100	85–95	0. 63–2. 00	0. 17–0. 23	4. 5–6. 0	Low to moderate	Low	High.
80–95	80–95	80–95	75–90	<0. 20	0. 17–0. 23	4. 5–5. 0	Low to moderate	Moderate	High.
70–90	65–90	65–90	60–90	0. 20–0. 63	0. 11–0. 17	4. 5–5. 0	Moderate	High	High.
75–100	70–95	65–85	60–80	0. 63–2. 00	0. 11–0. 20	4. 5–5. 0	Low	Low	High.
50–90	45–85	45–85	40–85	0. 63–2. 00	0. 06–0. 10	4. 5–5. 0	Low to moderate	Low	High.
95–100	95–100	90–100	85–95	0. 63–2. 00	0. 19–0. 23	6. 1–6. 5	Low to moderate	Low	Low.
95–100	95–100	95–100	90–95	0. 63–2. 00	0. 14–0. 17	6. 6–7. 8	Moderate	Moderate	Low.
95–100	95–100	95–100	90–100	0. 63–2. 00	0. 19–0. 23	5. 1–5. 5	Low	Low	Moderate.
80–100	80–100	80–100	75–100	0. 63–2. 00	0. 16–0. 19	5. 1–5. 5	Moderate	Low to moderate	Moderate.
95–100	90–100	85–100	80–95	0. 20–1. 00	0. 17–0. 20	7. 0–8. 0	Low	High	Low.
95–100	90–100	90–100	85–95	<0. 20	0. 14–0. 17	7. 0–8. 0	Moderate	High	Low.
95–100	95–100	95–100	90–100	0. 20–0. 63	0. 16–0. 19	5. 6–7. 5	Moderate	Low	Low to moderate.
95–100	85–100	85–100	80–95	<0. 20	0. 11–0. 16	7. 4–7. 8	Moderate to high.	Moderate	Low.
95–100	95–100	95–100	85–95	0. 63–2. 00	0. 19–0. 23	5. 1–5. 5	Low	Low	Moderate.
90–100	90–100	90–100	80–90	0. 63–2. 00	0. 17–0. 20	5. 6–6. 0	Low	Moderate	Moderate.
90–100	85–100	85–100	85–95	0. 20–0. 63	0. 17–0. 20	6. 6–8. 2	Moderate	Moderate	Low.
90–100	90–100	90–100	85–95	0. 20–0. 63	0. 15–0. 18	6. 6–8. 2	Moderate	High	Low.
95–100	90–100	90–100	85–95	0. 63–2. 00	0. 19–0. 23	5. 6–6. 0	Low to moderate	Moderate	Moderate.
95–100	90–100	90–100	85–95	0. 20–0. 63	0. 16–0. 19	5. 1–5. 5	Moderate	High	Moderate.
90–100	85–100	85–95	85–95	0. 20–0. 63	0. 16–0. 19	5. 6–6. 0	High	High	Moderate.
95–100	95–100	85–95	80–95	0. 63–2. 00	0. 19–0. 23	5. 6–6. 0	Low	Low	Moderate.
90–100	90–100	80–95	75–95	0. 63–2. 00	0. 17–0. 20	5. 1–5. 5	Moderate	Moderate	Moderate.
90–100	90–100	80–95	75–95	0. 63–2. 00	0. 15–0. 18	5. 1–5. 5	Moderate	Moderate	Moderate.
95–100	95–100	85–100	80–95	0. 63–2. 00	0. 19–0. 23	5. 6–7. 8	Low	Low	Low.
85–100	80–100	75–100	60–100	0. 63–2. 00	0. 19–0. 23	5. 6–7. 8	Low	Low	Low.
55–80	55–80	50–80	45–80	2. 00–6. 30	0. 10–0. 13	5. 6–7. 5	Low	Low	Low.
30–45	25–45	20–45	15–40	2. 00–6. 30	0. 05–0. 08	5. 6–7. 3	Low	Low	Low.
95–100	95–100	95–100	85–95	0. 63–2. 00	0. 19–0. 23	4. 5–5. 5	Low	Low	Moderate.
95–100	90–100	90–100	85–95	<0. 20	0. 16–0. 19	4. 5–5. 0	Moderate	High	High.
85–100	85–100	80–100	75–95	0. 20–0. 63	0. 17–0. 20	7. 4–7. 8	Moderate	Moderate	Low to moderate.

TABLE 5.—*Estimated engineering*

Soil series and map symbols	Depth to—		Depth from surface (typical profile)	Classification		
	Bedrock	Seasonal high water table		USDA texture	Unified [1]	AASHO [1]
	Feet	*Feet*	*Inches*			
Lindside: Ld	4–12	[2] 1½–3	0–24	Silt loam	ML or CL	A–4 or A–6
			24–46	Silty clay loam	ML or CL	A–6
Lowell: LwB, LwC2, LwD2, LyC3, LyD3.	4–6	6+	0–8	Silt loam	ML or ML–CL	A–4
			8–15	Silty clay loam	ML–CL or CL	A–7
			15–52	Silty clay to clay	CH, CL, MH, ML.	A–7
Markland: MkC, MkD2, MlC3, MlD3.	8–12	4+	0–6	Silt loam	ML or CL	A–4
			6–17	Silty clay	CL	A–6 or A–7
			17–34	Silty clay or clay	MH–CH or CH	A–7
			34–50	Silty clay	CH or CL	A–7
McGary: Mr	8–12	[2] 0–1½	0–7	Silt loam	ML or ML–CL	A–4 or A–6
			7–38	Silty clay	CL or CH	A–7
			38–57	Clay	CH or MH–CH	A–7
Melvin: Mt	6–10	[2] 0–½	0–30	Silt loam	ML or CL	A–4, A–6
			30–51	Silt loam	ML or CL	A–4, A–6
Newark: Ne	6–12	[2] ½–1½	0–24	Silt loam	ML or ML–CL	A–4
			24–68	Silty clay loam	ML or CL	A–4 or A–6
Nicholson: NhB	5–8	2–3	0–16	Silt loam	ML or CL	A–4 or A–6
			16–30	Silty clay loam	CL	A–6
			30–36	Silty clay loam (fragipan)	CL	A–6 or A–7
			36–52	Clay	CL or CH	A–7 or A–6
Otway: OtC, OtE	2–4	6+	0–9	Silty clay loam	ML–CL, CL or MH–CH	A–7 or A–4
			9–30	Clay	CH or CL	A–7 or A–6
			30–42	Clay and clay shale	CH or CL	A–6 or A–7
Pembroke: PbA, PbB, PbC, PeC3	5–9	6+	0–9	Silt loam	ML or ML–CL	A–4
			9–39	Silty clay loam	CL or ML–CL	A–6 or A–7
			39–60	Silty clay	CH or CL	A–7
Robertsville: Rb	5–12	[3] 0–1	0–18	Silt loam	ML or CL	A–4
			18–40	Silty clay loam (fragipan)	CL or ML–CL	A–6
			40–54	Silty clay	CL or CH	A–7 or A–6
Rockcastle: RcD, RcF, RkE3, RlF. For Weikert part of RlF, see Weikert series.	1¼–2	6+	0–7	Silt loam	ML or ML–CL	A–4 or A–6
			7–15	Silty clay	ML–CL or CH	A–6 or A–7
			15–24	Clay	CH or ML–CL	A–7 or A–6
			24	Shale.		
Rockland: Ro. No estimates; all properties variable. For Corydon part of complex, see Corydon series.						
Russellville: RuA, RuB	6–12	2–4	0–7	Silt loam	ML or ML–CL	A–4
			7–24	Silty clay loam	CL or ML–CL	A–6 or A–7
			24–43	Silty clay loam (fragipan)	CL	A–6
			43–56	Silty clay loam	CL or CH	A–7
Shelbyville: ShB	5–10	6+	0–14	Silt loam	ML–CL or ML	A–4
			14–31	Silty clay loam	ML–CL or CL	A–6
			31–38	Silty clay loam	CL or MH–CH	A–7, A–6
			38–52	Clay	CH or MH–CH	A–7
Shrouts: SoC, SoE	1–3½	6+	0–14	Silty clay to clay	CH or CL	A–6 or A–7
For Otway part of these mapping units, see Otway series.			14–26	Clay	CH	A–7
			26–34	Soft, calcareous shale.		

See footnotes at end of table.

properties of the soils—Continued

Percentage passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity	
No. 4	No. 10	No. 40	No. 200					Uncoated steel	Concrete
				Inches per hour	*Inches per inch of soil*	*pH*			
95–100	95–100	90–100	70–95	0. 63–2. 00	0. 19–0. 23	6. 1–7. 3	Low	Low	Low.
90–100	90–100	85–100	80–95	0. 63–2. 00	0. 17–0. 21	6. 1–7. 3	Low	Low	Low.
95–100	95–100	90–100	85–95	0. 63–2. 00	0. 19–0. 23	5. 1–7. 3	Low to moderate	Moderate	Low to moderate.
95–100	95–100	95–100	90–100	0. 63–2. 00	0. 16–0. 19	6. 6–7. 3	Moderate	High	Low to moderate.
95–100	95–100	90–100	90–100	0. 20–0. 63	0. 14–0. 17	4. 5–6. 5	Moderate to high	High	Low to high.
95–100	95–100	95–100	90–100	0. 63–2. 00	0. 19–0. 23	4. 5–5. 1	Low	Low	High.
95–100	95–100	95–100	95–100	0. 20–0. 63	0. 14–0. 17	4. 5–5. 1	Moderate	High	High.
95–100	95–100	90–100	90–100	0. 20–0. 63	0. 14–0. 17	5. 1–5. 5	Moderate to high	High	High.
90–100	90–100	85–95	85–95	0. 20–0. 63	0. 14–0. 17	7. 4–8. 2	Moderate to high	Low	Low.
95–100	95–100	95–100	90–95	0. 63–2. 00	0. 19–0. 23	4. 5–5. 5	Low	Low	High.
95–100	95–100	95–100	90–100	<0. 20	0. 14–0. 17	4. 5–5. 5	Moderate	High	Moderate to high.
95–100	95–100	95–100	95–100	<0. 20	0. 14–0. 17	7. 4–8. 2	Moderate to high	Moderate	Low.
95–100	95–100	85–100	80–100	0. 63–2. 00	0. 19–0. 23	5. 6–7. 8	Low	High	Low.
90–100	90–100	80–100	70–95	0. 63–2. 00	0. 19–0. 23	5. 6–7. 8	Low to moderate	High	Low.
95–100	95–100	95–100	90–95	0. 63–2. 00	0. 19–0. 23	5. 6–7. 8	Low	High	Low.
95–100	95–100	95–100	85–95	0. 63–2. 00	0. 17–0. 23	5. 6–7. 8	Low to moderate	High	Low.
95–100	95–100	90–100	85–95	0. 63–2. 00	0. 19–0. 23	5. 1–6. 5	Low	Low	Moderate to low.
95–100	95–100	90–100	85–95	0. 63–2. 00	0. 17–0. 19	5. 1–5. 5	Moderate	Moderate	Moderate.
85–95	80–95	75–95	70–95	<0. 20	0. 15–0. 19	4. 5–5. 5	Moderate	High	Moderate.
90–100	90–100	85–100	80–95	0. 20–0. 63	0. 14–0. 17	6. 1–6. 5	Moderate to high	Moderate	Low.
95–100	95–100	95–100	85–95	0. 20–0. 63	0. 16–0. 19	7. 4–8. 2	Moderate	Low	Low.
95–100	95–100	95–100	90–95	0. 20–0. 63	0. 14–0. 17	7. 4–8. 2	Moderate to high	Low	Low.
75–90	70–90	65–90	55–90	0. 20–0. 63	0. 10–0. 13	7. 4–8. 2	Moderate to high	Low	Low.
95–100	95–100	95–100	90–100	0. 63–2. 00	0. 19–0. 23	5. 6–7. 3	Low	Low	Low to moderate.
95–100	95–100	90–95	80–95	0. 63–2. 00	0. 17–0. 19	5. 6–6. 5	Moderate	Low	Low to moderate.
90–100	90–100	85–100	80–95	0. 63–2. 00	0. 14–0. 17	5. 1–6. 0	Moderate	Moderate	Low to moderate.
95–100	90–100	85–100	80–95	0. 63–2. 00	0. 19–0. 23	4. 5–5. 6	Low	High	Moderate to high.
95–100	95–100	90–100	85–100	<0. 20	0. 15–0. 19	4. 5–5. 0	Low	High	Moderate to high.
90–100	85–100	80–100	70–95	0. 20–0. 63	0. 15–0. 18	4. 5–5. 0	Moderate	High	Moderate to high.
95–100	90–100	90–100	85–100	0. 63–2. 00	0. 18–0. 22	4. 5–5. 0	Low	Moderate	High.
90–100	85–95	85–95	80–95	<0. 20	0. 13–0. 16	4. 5–5. 0	Moderate	High	High.
85–95	80–95	80–95	75–95	<0. 20	0. 12–0. 15	4. 5–5. 0	Moderate	High	High.
95–100	95–100	95–100	95–100	0. 63–2. 00	0. 19–0. 23	4. 5–7. 4	Low	Low	Moderate to low.
95–100	95–100	95–100	95–100	0. 63–2. 00	0. 16–0. 19	5. 1–7. 4	Low	Low	Moderate.
95–100	90–100	90–100	85–95	<0. 20	0. 15–0. 19	4. 5–5. 5	Low	Moderate	Moderate.
60–95	60–96	60–95	55–95	0. 20–0. 63	0. 16–0. 19	4. 5–5. 5	Moderate	Moderate	Moderate.
95–100	95–100	90–100	85–95	0. 63–2. 00	0. 19–0. 23	6. 1–6. 6	Low	Low	Low.
95–100	95–100	90–100	90–95	0. 63–2. 00	0. 16–0. 19	5. 1–6. 0	Moderate	Moderate	Low to moderate.
85–95	75–95	70–95	65–90	0. 20–0. 63	0. 15–0. 18	5. 1–6. 5	Moderate	Moderate	Low to moderate.
95–100	95–100	90–100	85–75	0. 20–0. 63	0. 14–0. 17	5. 1–6. 5	Moderate to high	Moderate	Low.
90–100	85–100	85–100	80–100	0. 20–0. 63	0. 14–0. 17	7. 4–8. 2	Moderate to high	Low	Low.
85–100	80–100	80–100	75–100	0. 20–0. 63	0. 10–0. 13	7. 4–8. 2	Moderate to high	Low	Low.

TABLE 5.—*Estimated engineering*

Soil series and map symbols	Depth to—		Depth from surface (typical profile)	Classification		
	Bedrock	Seasonal high water table		USDA texture	Unified [1]	AASHO [1]
	Feet	*Feet*	*Inches*			
Tilsit: TlB, TlC2	3–5	1½–3	0–25	Silt loam	ML or ML–CL	A–4
			25–34	Silty clay loam (fragipan)	CL or ML–CL	A–6
			34–40	Silty clay	CL or ML–CL	A–6 or A–4
			40	Shale.		
Trappist: TpB, TpB2, TpC, TpC2, TpD, TpD2, TrC3, TrD3.	2–3½	6+	0–10	Silt loam	ML or CL	A–4
			10–31	Silty clay loam	CL or ML–CL	A–6 or A–7
			31–37	Shaly silty clay loam	CL or ML–CL	A–6 or A–7
			37–44	Brittle, grayish–and reddish-brown shale.		
Trimble: TsB, TsC, TsD, TtD3	5–10	6+	0–6	Cherty silt loam	ML or GM	A–4
			6–68	Cherty silty clay loam	CL or GM–GC	A–7 or A–6
			68–108	Cherty silty clay loam	CL, GM–GC	A–7 or A–6
Weikert	1–2	6+	0–8	Shaly silt loam	ML, GM or SM	A–4
			8–19	Shaly silty clay loam	ML or GM	A–1, A–2, or A–4
Whitley: WhB, WhC, WhD	4–7	6+	0–10	Silt loam	ML	A–4
			10–38	Silty clay loam	CL	A–6
			38–52	Silty clay loam	CL	A–6 or A–7
Woolper: WoB, WoC, WoD2	5–10	6+	0–9	Silty clay loam	ML or CL	A–4 or A–6
			9–44	Silty clay	CL or MH	A–6 or A–7
			44–56	Clay	CH or CL	A–7
Zanesville: ZaB, ZaC2	5–7	2–4	0–13	Silt loam	ML	A–4
			13–28	Silty clay loam	CL or ML–CL	A–6 or A–7
			28–39	Silty clay loam (fragipan)	CL or ML–CL	A–6 or A–7
			39–54	Silty clay loam	CL	A–6

[1] Estimate based on 100 percent passing the 3-inch sieve.
[2] Subject to flooding.
[3] Areas on stream terraces subject to flooding.

properties of the soils—Continued

Percentage passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity	
No. 4	No. 10	No. 40	No. 200					Uncoated steel	Concrete
				Inches per hour	*Inches per inch of soil*	*pH*			
95–100	95–100	95–100	85–100	0. 63–2. 00	0. 19–0. 23	4. 5–5. 5	Low	Moderate	Moderate to high.
90–100	90–100	85–95	80–95	<0. 20	0. 15–0. 19	4. 5–5. 5	Low	High	Moderate to high.
80–100	80–100	80–100	75–95	0. 20–0. 63	0. 15–0. 18	4. 5–5. 5	Moderate	High	Moderate to high.
90–100	85–100	75–95	70–90	0. 63–2. 00	0. 15–0. 23	4. 5–5. 0	Low	Moderate	High.
90–100	85–100	80–100	75–95	0. 20–0. 63	0. 16–0. 19	4. 5–5. 0	Moderate	High	High.
60–95	55–90	55–90	50–90	0. 20–0. 63	0. 13–0. 17	4. 5–5. 0	Moderate	High	High.
55–90	50–85	45–80	40–75	0. 63–2. 00	0. 13–0. 16	4. 5–7. 4	Low	Low	Moderate to high.
50–85	45–80	45–80	40–75	0. 63–2. 00	0. 11–0. 14	4. 5–5. 0	Low	Moderate	High.
50–75	45–70	45–70	40–70	0. 63–2. 00	0. 11–0. 14	4. 5–5. 0	Low	Moderate	High.
65–80	55–80	50–75	45–70	0. 63–2. 00	0. 09–0. 13	4. 5–5. 5	Low	Low	Moderate to high.
35–80	30–70	25–65	20–55	2. 0–6. 3	0. 07–0. 11	4. 5–5. 5	Low	Moderate	Moderate to high.
95–100	95–100	90–100	75–95	0. 63–2. 00	0. 19–0. 23	4. 5–5. 5	Low	Low	Moderate to high.
95–100	95–100	90–95	85–95	0. 63–2. 00	0. 16–0. 19	4. 5–5. 5	Low	Moderate	Moderate to high.
90–100	85–95	80–95	75–90	0. 63–2. 00	0. 16–0. 19	4. 5–5. 5	Low	Moderate	Moderate to high.
95–100	95–100	90–95	85–95	0. 63–2. 00	0. 16–0. 19	6. 1–7. 4	Moderate	Low	Low.
95–100	95–100	90–100	85–100	0. 20–0. 63	0. 15–0. 18	6. 1–7. 4	Moderate	Moderate	Low.
95–100	95–100	90–100	90–100	0. 20–0. 63	0. 14–0. 17	6. 1–7. 4	High	Moderate	Low.
95–100	95–100	90–100	85–100	0. 63–2. 00	0. 19–0. 23	4. 5–5. 5	Low	Moderate	High.
95–100	95–100	90–100	80–95	0. 63–2. 00	0. 16–0. 19	4. 5–5. 5	Low	Moderate	High.
90–100	85–100	80–100	75–95	<0. 20	0. 15–0. 19	4. 5–5. 5	Low	High	High.
95–100	90–100	85–100	80–95	0. 20–0. 63	0. 16–0. 19	4. 5–5. 5	Low	High	High.

TABLE 6.—*Interpretations of*

Soil series and map symbols	Suitability as a source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Farm ponds: Reservoir area
Baxter: BaD	Poor: high chert content.	Poor: plastic; moderate shrink-swell potential.	Fair stability; high chert content.	Seepage; bedrock cavernous in places.
Beasley: BeB, BeC2, BeD2, BlC3, BlD3.	Good to fair in upper 6 inches; poor in subsoil because of high clay content.	Poor: highly plastic; moderate shrink-swell potential.	Fair stability; bedrock at a depth of 3½ to 5 feet.	Excessive seepage if bedrock is exposed.
Bedford: BrA, BrB, BrC2.	Fair above the fragipan, which is at a depth of about 2 feet, seasonal high water table.	Fair: low to moderate shrink-swell potential.	Seasonal high water table.	All features favorable.
Colyer: ChD, ClE3, CmF.	Poor: limited quantity; shale at a depth of ½ to 1½ feet.	Fair: limited quantity; low to moderate shrink-swell potential.	Shale at a depth of ½ to 1½ feet; some steep slopes.	Shale at a depth of ½ to 1½ feet.
Corydon: CnB, CnC2, CnD2, CoD3, CrD2, CsE3.	Poor: high clay content; limited quantity.	Poor: limited quantity; low to moderate shrink-swell potential.	Bedrock at a depth of 1 to 3 feet; some steep slopes.	Excessive seepage because of cavernous bedrock.
Crider: CtC	Good to a depth of about 2 feet.	Fair: low to moderate shrink-swell potential.	All features favorable	All features favorable
Dunning: Du	Fair to good; seasonal high water table; high clay content.	Poor: highly plastic; low to moderate shrink-swell potential; seasonal high water table.	Flooding; seasonal high water table; highly plastic.	Flooding; seasonal high water table.
Eden: EcF2, EeC3, EeE3, EfE3, EfF3.	Poor: high clay content; stones.	Poor: highly plastic; stones; low to moderate shrink-swell potential.	Steep slopes; poor stability.	Excessive seepage because of creviced bedrock.
Elk: EkA, EkB, EkC	Good	Good to fair	All features favorable	Moderately permeable subsoil.
Fairmount: FaD, FfE, FmD3, FmF3.	Poor: limited quantity; high clay content; flagstones; bedrock at a depth of ½ to 2 feet.	Poor: highly plastic; limited quantity; flagstones; moderate shrink-swell potential.	Bedrock at a depth of ½ to 2 feet; some steep slopes; limestone outcrops.	Bedrock at a depth of ½ to 2 feet; excessive seepage because of creviced rock.

engineering properties of the soils

Soil features affecting—Continued					
Farm ponds—Con. Embankment	Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways	Foundations for low buildings
Poor compaction qualities.	Practice not applicable or not needed.	Steep slopes	Clayey subsoil; slopes of more than 12 percent.	High chert content	Moderate shrink-swell potential; slopes of more than 12 percent.
Fair to poor compaction qualities; poor workability.	Practice not applicable or not needed.	Moderately slow permeability.	Clayey subsoil; some steep slopes of more than 12 percent; poor workability.	Vegetation difficult to establish; erodible on steep slopes.	Moderate shrink-swell potential; some slopes more than 12 percent; unweathered shale at a depth of 3½ to 5 feet.
Fair stability	Seasonal high water table; slow permeability in fragipan.	Seasonal high water table; slow permeability in fragipan.	All features favorable.	Seepage from side slopes.	Low to moderate shrink-swell potential; seasonal high water table.
Limited quantity; piping.	Practice not applicable or not needed.	Shale at a depth of ½ to 1½ feet; very low available water capacity.	Shale at a depth of ½ to 1½ feet; some steep slopes.	Vegetation difficult to establish; shale at a depth of ½ to 1½ feet; erodible on steep slopes.	Shale at a depth of ½ to 1½ feet; low to moderate shrink-swell potential; some steep slopes.
Limited quantity; subsoil excellent core material.	Practice not applicable or not needed.	Bedrock at a depth of 1 to 3 feet; some steep slopes.	Some steep slopes; very rocky.	Bedrock at a depth of 1 to 3 feet; some steep slopes; rocky; erodible on steep slopes.	Bedrock at a depth of 1 to 3 feet; most slopes more than 12 percent; low to moderate shrink-swell potential.
All features favorable.	Practice not applicable or not needed.	All features favorable.	All features favorable.	All features favorable.	Low to moderate shrink-swell potential.
Poor compaction qualities; high compressibility; good core material; poor workability.	Flooding; seasonal high water table; slow permeability.	Slow permeability; seasonal high water table; flooding.	Clayey subsoil; poor workability.	Seasonal high water table.	Flooding; seasonal high water table; high compressibility; low to moderate shrink-swell potential.
Poor stability and workability; high compressibility.	Practice not applicable or not needed.	Steep slopes; slow permeability.	High clay content; steep slopes.	Steep slopes; high clay content; erodible on steep slopes.	Steep slopes; high clay content; low shear strength; low to moderate shrink-swell potential.
All features favorable.	Practice not applicable or not needed.	All features favorable.	All features favorable.	All features favorable.	All features favorable.
Limited quantity; high compressibility; poor workability.	Practice not applicable or not needed.	Bedrock at a depth of ½ to 2 feet; steep slopes.	Steep slopes; bedrock at a depth of ½ to 2 feet; high clay content; poor workability.	Steep slopes; bedrock at a depth of ½ to 2 feet; clayey.	Bedrock at a depth of ½ to 2 feet; steep slopes; moderate shrink-swell potential.

TABLE 6.—*Interpretations of*

Soil series and map symbols	Suitability as a source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Farm ponds: Reservoir area
Faywood: FwC2, FwD2, FyD3.	Fair in surface layer; poor in subsoil.	Poor: highly plastic; limited quantity; moderate to high shrink-swell potential.	Bedrock at a depth of 2 to 3 feet.	Seepage if bedrock is exposed.
Gullied land: Ga, Gc. All characteristics variable; requires onsite investigation.				
Hagerstown: HaB, HaC, HgD3.	Good to a depth of about 1 foot; poor in subsoil.	Fair: plastic; moderate shrink-swell potential.	Karst topography	Seepage in some areas because of cavernous bedrock.
Huntington: HuA, HuC	Good: flooding	Fair: poor stability	Flooding	Moderately rapid permeability.
Huntington, gravelly variant: Hv.	Poor: high gravel content; flooding.	Fair to good	Flooding	Moderately rapid permeability.
Lawrence: Lc	Fair to a depth of about 1½ feet; seasonal high water table.	Fair: fair stability; seasonal high water table; low to moderate shrink-swell potential.	Seasonal high water table.	Seasonal high water table.
Lindside: Ld	Good: seasonal high water table; flooding.	Fair: fair stability; fair compaction qualities.	Flooding: seasonal high water table.	Moderate permeability; flooding.
Lowell: LwB, LwC2, LwD2, LyC3, LyD3.	Fair to a depth of about 1 foot; poor below.	Poor: highly plastic	High clay content in lower part of subsoil.	Seepage if bedrock is exposed.
Markland: MkC, MkD2, MlC3, MlD3.	Poor: clayey subsoil	Poor: highly plastic; moderate to high shrink-swell potential.	Instability; landslides	All features favorable
McGary Mr	Poor: clayey subsoil; seasonal high water table.	Poor: highly plastic; seasonal high water table.	Seasonal high water table; low shear strength.	Level; seasonal high water table.
Melvin: Mt	Fair: seasonal high water table; flooding.	Poor: poor stability; poor compaction qualities; seasonal high water table.	Flooding; seasonal high water table.	Moderate permeability; seasonal high water table; flooding.
Newark: Ne	Fair: seasonal high water table; flooding.	Poor: poor stability; poor compaction qualities; seasonal high water table.	Seasonal high water table; flooding.	Moderate permeability; seasonal high water table; flooding.

engineering properties of the soils—Continued

Soil features affecting—Continued					
Farm ponds—Con. Embankment	Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways	Foundations for low buildings
Clayey; fair stability; high compressibility; poor workability.	Practice not applicable or not needed.	Some steep slopes; moderately slow permeability.	Some slopes of more than 12 percent; clayey subsoil; poor workability.	High clay content of subsoil; erodible on steep slopes.	Bedrock at a depth of 2 to 3 feet; moderately high shrink-swell potential; some slopes of more than 12 percent.
Fair stability; medium compressibility.	Practice not applicable or not needed.	All features favorable.	Some slopes of more than 12 percent.	Erodible on steep slopes.	Moderate shrink-swell potential; some slopes of more than 12 percent.
Piping; fair stability.	Practice not applicable or not needed.	All features favorable.	Moderately rapid permeability; poor stability.	All features favorable.	Flooding; bedrock at a depth of 4 to 10 feet.
Moderately rapid permeability; fair stability.	Practice not applicable or not needed.	Moderate available water capacity; flooding.	Moderately rapid permeability.	Gravel: moderate available water capacity.	Flooding.
Fair stability	Slow permeability; seasonal high water table; fragipan at a depth of 15 to 23 inches.	Slow permeability; seasonal high water table.	Seasonal high water table.	Seepage from side slopes; seasonal high water table; fragipan at a depth of 15 to 23 inches.	Seasonal high water table; fragipan at a depth of 15 to 23 inches; low to moderate shrink-swell potential.
Piping; poor stability.	Seasonal high water table; flooding.	Seasonal high water table; flooding.	Seasonal high water table; fair stability.	All features favorable.	Flooding; seasonal high water table.
Poor workability; fair stability; high compressibility.	Practice not applicable or not needed.	Moderately slow permeability; some slopes of more than 12 percent.	Some slopes of more than 12 percent; clayey subsoil; poor workability.	All features favorable; erodible on steep slopes.	Moderate to high shrink-swell potential; clayey subsoil; some slopes of more than 12 percent.
Poor workability; poor stability good core material.	Practice not applicable or not needed.	Moderately slow permeability; some slopes of more than 12 percent.	Poor workability; some slopes of more than 12 percent.	Erodible on steep slopes.	Clayey subsoil; moderate to high shrink-swell potential; some slopes of more than 12 percent.
Very poor workability and stability; impervious core material.	Seasonal high water table; slow permeability.	Slow permeability; seasonal high water table.	High clay content; poor workability; seasonal high water table; somewhat poor drainage.	Somewhat poor drainage.	Low shear strength; seasonal high water table; moderate to high shrink-swell potential.
Piping; poor stability; poor compaction qualities.	Flooding; seasonal high water table; outlet problem.	Poor drainage; flooding.	Seasonal high water table; poor drainage.	Poor drainage	Flooding; seasonal high water table; instability.
Piping; poor compaction qualities.	Flooding; seasonal high water table.	Somewhat poor drainage; flooding.	Seasonal high water table; somewhat poor drainage.	Somewhat poor drainage.	Seasonal high water table; flooding.

TABLE 6.—*Interpretations of*

Soil series and map symbols	Suitability as a source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Farm ponds: Reservoir area
Nicholson: NhB	Good: seasonal high water table.	Fair: moderate shrink-swell potential; seasonal high water table.	Seasonal high water table.	All features favorable
Otway: OtC, OtE	Poor: clayey texture	Poor: highly plastic; limited quantity; moderate to high shrink-swell potential.	Steep slopes; bedrock at a depth of 2 to 4 feet.	Steep slopes; seepage through bedrock.
Pembroke: PbA, PbB, PbC, PeC3.	Good	Fair: moderate shrink-swell potential.	Some areas of karst topography.	Seepage if excavated to bedrock; sinkholes in some areas.
Robertsville: Rb	Poor: seasonal high water table; flooding.	Poor: poor stability; poor compaction qualities; seasonal high water table.	Seasonal high water table; flooding.	Level; limited to dug ponds; seasonal high water table.
Rockcastle: RcD, RcF, RkE3, RlF. For Weikert part of RlF, see Wiekert series.	Poor: clayey texture	Poor: highly plastic; limited quantity; moderate shrink-swell potential.	Shale at a depth of 1¼ to 2 feet; steep slopes; slides.	Steep slopes
Rock land: Ro. All characteristics variable; requires onsite investigation. For Corydon part, see Corydon series.				
Russellville: RuA, RuB	Good: seasonal high water table.	Fair: seasonal high water table; low to moderate shrink-swell potential.	Seasonal high water table.	All features favorable
Shelbyville: ShB	Good to a depth of 1½ feet.	Fair to a depth of 2½ feet: moderate shrink-swell potential.	Material below a depth of 2½ feet is highly plastic.	Seepage where bedrock is exposed.
Shrouts: SoC, SoE For Otway part of these mapping units, see Otway series.	Poor: clayey texture	Poor: highly plastic; limited quantity; moderate to high shrink-swell potential.	Shale at a depth of 1 to 3½ feet; steep slopes; slides.	All features favorable
Tilsit: TlB, TlC2	Fair: seasonal high water table.	Fair: low to moderate shrink-swell potential; seasonal high water table.	Seasonal high water table; shale or sandstone at a depth of 3 to 5 feet.	All features favorable
Trappist: TpB, TpB2, TpC, TpC2, TpD, TpD2, TrC3, TrD3.	Fair	Poor to fair: limited quantity; moderate shrink-swell potential.	Shale at a depth of 2 to 3½ feet.	All features favorable

engineering properties of the soils—Continued

Soil features affecting—Continued					
Farm ponds—Con. Embankment	Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways	Foundations for low buildings
Fair stability	Practice not applicable or not needed.	Slowly permeable fragipan.	All features favorable.	All features favorable.	Seasonal high water table; moderate shrink-swell potential.
Poor workability; high compressibility; limited quantity.	Practice not applicable or not needed.	Steep slopes; bedrock at a depth of 2 to 4 feet; moderately slow permeability.	Steep slopes; poor workability; bedrock at a depth of 2 to 4 feet; high clay content.	Steep slopes; bedrock at a depth of 2 to 4 feet; erodible.	Steep slopes; bedrock at a depth of 2 to 4 feet; moderate to high shrink-swell potential.
Medium compressibility; fair stability.	Practice not applicable or not needed.	All features favorable.	All features favorable.	All features favorable.	Moderate shrink-swell potential; sinkholes in some areas.
Poor stability; poor compaction qualities.	Very slow permeability; flooding; seasonal high water table.	Very slow permeability; shallow to fragipan; poor drainage.	Practice is not applicable or is not needed on this soil.	Poor drainage; shallow to fragipan.	Seasonal high water table; flooding of some areas.
Poor workability; low shear strength; limited quantity.	Practice not applicable or not needed.	Shale at a depth of 1¼ to 2 feet; steep slopes; slow permeability in fragipan.	Steep slopes; clayey subsoil; shale at a depth of 1¼ to 2 feet; poor workability.	Steep slopes; low fertility; difficult to establish vegetation; erodible.	Shale at a depth of 1¼ to 2 feet; steep slopes; low shear strength; moderate shrink-swell potential.
Fair stability	Practice not applicable or not needed.	Slow permeability in fragipan.	All features favorable.	All features favorable.	Seasonal high water table; low to moderate shrink-swell potential.
Material below a depth of 2½ feet is highly plastic.	Practice not applicable or not needed.	All features favorable.	All features favorable.	All features favorable.	Moderate shrink-swell potential.
High clay content; poor workability and stability; limited quantity.	Practice not applicable or not needed.	Shale at a depth of 1 to 3½ feet; steep slopes; moderately slow permeability.	Steep slopes; high clay content; shale at a depth of 1 to 3½ feet; poor workability.	Steep slopes; low fertility; difficult to establish vegetation; erodible.	Shale at a depth of 1 to 3½ feet; steep slopes; moderate to high shrink-swell potential; slides.
Fair stability	Slow permeability in fragipan; seasonal high water table.	Slow permeability in fragipan; seasonal high water table.	All features favorable.	Seepage from side slopes; fragipan at a depth of about 2 feet.	Seasonal high water table; shale or sandstone at a depth of 3 to 5 feet; low to moderate shrink-swell potential.
All features favorable.	Practice not applicable or not needed.	Moderate available water capacity; some slopes of more than 12 percent; moderately slow permeability.	Some slopes of more than 10 percent; clayey subsoil; poor workability.	Moderate available water capacity; erodible on steep slopes.	Shale at a depth of 2 to 3½ feet; moderate shrink-swell potential; some slopes of more than 12 percent.

TABLE 6.—*Interpretations of*

Soil series and map symbols	Suitability as a source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Farm ponds
				Reservoir area
Trimble: TsB, TsC, TsD, TtD3.	Fair: cherty	Good	All features favorable	Chert bed below a depth of 5 feet; moderate permeability.
Weikert	Poor: channery	Fair: limited quantity	Shale at a depth of 1 to 2 feet.	Moderate permeability
Whitley: WhB, WhC, WhD.	Good	Good	All features favorable	Moderate permeability
Woolper: WoB, WoC, WoD2.	Fair: clayey texture	Poor: high clay content; moderate to high shrink-swell potential.	All features favorable	All features favorable
Zanesville: ZaB, ZaC2	Fair	Fair: seasonal high water table.	All features favorable	All features favorable

Moisture-density data are important in earthwork, for as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content. If a soil is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, the dry density decreases with increase in moisture content. The highest dry density obtained in the compaction test is termed maximum dry density.

Mechanical analysis shows the proportions of soil particles of various sizes in a particular soil sample. Soil particles that do not pass through the No. 200 sieve are sand and other coarser materials. Particles that are larger than 0.002 millimeter in diameter and pass through the No. 200 sieve are silt. Particles that are smaller than 0.002 millimeter in diameter and pass through the No. 200 sieve are clay. The clay fraction was determined by the hydrometer method, rather than by the pipette method, which most soil scientists use to determine the clay content of soil samples. (Generally, coarse fragments larger than 3 inches in diameter were discarded.)

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 semisolid 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. The liquid limit is the moisture content at which the material changes 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 the soil material is plastic.

The AASHO and Unified classifications are explained under the heading "Engineering Classification Systems."

Estimated Engineering Properties

Estimates of soil properties significant in engineering are given in table 5. The estimates were based on field classification and descriptions, physical and chemical tests of selected representative samples, the test data in table 4, test data from other counties, and information from other parts of this survey.

The seasonal high water table is the level of free water in the soil during the season of highest rainfall. This free water may be either part of the ground water or perched water that is separated from the ground water by a nearly impervious layer of soil.

Permeability refers to the movement of water downward through undisturbed and uncompacted soil. It does not include lateral seepage. The estimates are based on the structure and porosity of the soil. Plowpans, surface crusts, and other properties resulting from use of the soils are not considered.

Available water capacity is that amount of capillary water in the soil available for plant growth after all free water has drained away. It is expressed as inches per inch of soil.

Reaction is the degree of acidity or alkalinity of a soil, expressed as pH value. Reaction is defined in the Glossary.

Shrink-swell potential is an indication of the volume change to be expected of the soil material with changes in moisture content. Shrinking and swelling of soils

engineering properties of the soils—Continued

Soil features affecting—Continued					
Farm ponds—Con. Embankment	Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways	Foundations for low buildings
All features favorable.	Practice not applicable or not needed.	Some slopes of more than 12 percent.	Some slopes of more than 10 percent.	Chert impairs workability; erodible on steep slopes.	Some slopes of more than 12 percent.
Fair stability; limited quantity.	Practice not applicable or not needed.	Low available water capacity; steep slopes.	Shale at a depth of 1 to 2 feet; steep.	Shale at a depth of 1 to 2 feet; erodible.	Shale at a depth of 1 to 2 feet; steep slopes.
Fair stability	Practice not applicable or not needed.	Some slopes of more than 12 percent.	Some slopes of more than 10 percent.	All features favorable.	Bedrock at a depth of 4 to 7 feet; some slopes of more than 12 percent.
Poor workability and stability.	Practice not applicable or not needed.	Moderately slow permeability.	Clayey subsoil; poor workability.	Clayey texture	Moderate shrink-swell potential; some slopes of more than 12 percent.
Fair stability	Practice not applicable or not needed.	Slow permeability in fragipan.	All features favorable.	All features favorable.	Seasonal high water table.

causes much damage to building foundations, roads, and other structures. A high shrink-swell potential indicates hazards to the maintenance of structures built in, on, or with such materials.

Corrosivity, as used here, indicates the potential danger to uncoated metal or concrete structures through chemical action that dissolves or weakens the structural material. Structural materials corrode when buried in some kinds of soil more rapidly than in others. Extensive installations that cross soil boundaries or soil horizons are more likely to be damaged by corrosion than are installations that are entirely in one kind of soil or one soil horizon.

Interpretations of Engineering Properties

Table 6 contains selected information useful to engineers and others who plan to use soil material in construction of highways, farm facilities, buildings, and sewage disposal systems. Detrimental or undesirable features are emphasized. The ratings and other interpretations in table 6 are based on the estimated engineering properties given in table 5, on available test data, and on field experience. They apply only to the depths indicated in table 5.

Topsoil is a term used to designate a fertile soil or soil material, ordinarily one rich in organic matter, used as a topdressing for lawns, gardens, roadbanks, and the like.

Road fill is material used to build embankments. The ratings indicate performance of soil material moved from borrow areas for these purposes.

Highway location is influenced by features of the undisturbed soil that affect construction and maintenance of highways.

Farm pond reservoir areas are affected mainly by loss of water through seepage, and the soil features named are mainly those that influence seepage.

Farm pond embankments serve as dams. The features of disturbed soil material from both subsoil and substratum are important in constructing embankments.

Agricultural drainage is influenced by features of the undisturbed soil which affect the installation and performance of surface and subsurface drainage installations.

Irrigation is affected by features of the undisturbed soil that influence soil-moisture relations and the potential of a soil to produce specific crops. A feasibility study should be made by a qualified consultant before an irrigation project is planned.

Terraces and diversions are affected by soil features that affect stability or hinder layout and construction. Hazards of sedimentation in channels and difficulty of establishing and maintaining cover are important considerations for diversions.

Grassed waterways are affected by soil features that are important to the establishment, growth, and maintenance of plants or that affect layout and construction.

Foundations for low buildings are affected chiefly by features of the undisturbed soil that influence its capacity to support low buildings that have normal foundation loads. Specific bearing values are not given in the tables, and none should be inferred.

Nonfarm and Recreational Developments

Table 7 shows the degree and kind of limitation of each soil of the county for the following nine uses: septic tank filter fields; sewage lagoons; sites for homes or recreation buildings with basements; campsites; roads

TABLE 7.—*Limitation of the soils*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Homes and recreation service buildings, with basements	Campsites (intensive use)	
				Tent sites	Trailer sites
Baxter: BaD	Severe: slope	Severe: slope	Moderate: slope. (Severe for subdivision.)	Severe: slope	Severe: slope
Beasley:					
BeB	Severe: moderately slow permeability.	Moderate: depth to bedrock is 3½ to 5 feet; slope.	Moderate: moderate shrink-swell potential.	Moderate: moderately slow permeability.	Moderate: moderately slow permeability; slope.
BeC2	Severe: moderately slow permeability.	Severe: slope	Moderate: moderate shrink-swell potential; slope.	Moderate: moderately slow permeability; slope.	Severe: slope
BeD2	Severe: moderately slow permeability.	Severe: slope	Moderate: moderate shrink-swell potential. (Severe for subdivision.)	Severe: slope	Severe: slope
BlC3	Severe: moderately slow permeability.	Severe: slope	Moderate: moderate shrink-swell potential; slope.	Moderate: moderately slow permeability; slope; silty clay loam surface layer.	Severe: slope
BlD3	Severe: moderately slow permeability; slope.	Severe: slope	Moderate: moderate shrink-swell potential; slope. (Severe for subdivision.)	Severe: slope	Severe: slope
Bedford:					
BrA	Severe: slow permeability.	Slight	Moderate: high water table.	Severe: slow permeability in fragipan.	Severe: slow permeability in fragipan.
BrB	Severe: slow permeability.	Moderate: slope	Moderate: high water table.	Severe: slow permeability in fragipan.	Severe: slow permeability in fragipan.
BrC2	Severe: slow permeability.	Severe: slope	Moderate: high water table; slope.	Severe: slow permeability in fragipan.	Severe: slow permeability in fragipan; slope.
Colyer:					
ChD	Severe: shallow to bedrock.	Severe: shallow to bedrock; moderate permeability; slope.	Moderate: shallow to bedrock; slope. (Severe for subdivision where slope is more than 12 percent.)	Moderate to severe: slope.	Severe: slope
CmF	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; moderate permeability; slope.	Severe: slope	Severe: slope	Severe: slope
ClE3	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; moderate permeability; slope.	Moderate: shallow to bedrock; slope. (Severe for subdivision where slope is more than 12 percent.)	Moderate to severe: slope.	Severe: slope

for nonfarm and recreational uses

Roads and parking lots		Athletic fields (intensive use)	Play and picnic areas (extensive use)	Lawns, landscaping, and golf fairways	Sanitary land fill (trench method)
County and access roads	Streets and parking lots in subdivisions				
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope; silty clay texture.
Moderate: moderate shrink-swell potential.	Moderate: moderate shrink-swell potential; slope.	Moderate: slope	Slight	Slight	Severe: clay texture.
Moderate: moderate shrink-swell potential.	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope	Severe: clay texture.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope; clay texture.
Moderate: moderate shrink-swell potential.	Severe: slope	Severe: slope	Moderate: slope; silty clay loam surface layer.	Moderate: slope; silty clay loam surface layer; effects of erosion.	Severe: clay texture.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: effects of erosion; slope.	Severe: silty clay texture; slope.
Moderate: high water table.	Moderate: high water table.	Severe: slow permeability in fragipan.	Slight	Slight	Moderate: high water table.
Moderate: high water table.	Moderate: high water table; slope.	Severe: slow permeability in fragipan.	Slight	Slight	Moderate: high water table.
Moderate: high water table; slope.	Severe: slope	Severe: slow permeability in fragipan; slope.	Moderate: slope	Moderate: slope	Moderate: slope; high water table.
Moderate to severe: shallow to bedrock; slope.	Severe: slope	Severe: slope	Moderate to severe: slope.	Moderate to severe: slope; shallow to shale bedrock.	Severe: slope; shallow to shale bedrock.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: shallow to bedrock; slope.
Moderate to severe: shallow to bedrock; slope.	Severe: slope	Severe: slope	Moderate to severe: slope.	Severe: slope; effects of erosion.	Severe: shallow to bedrock; slope; silty clay loam surface layer.

TABLE 7.—*Limitation of the soils*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Homes and recreation service buildings, with basements	Campsites (intensive use)	
				Tent sites	Trailer sites
Corydon:					
CnB	Severe: moderate permeability; shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.	Slight	Moderate: slope
CnC2	Severe: moderate permeability; shallow to bedrock.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock.	Moderate: slope	Severe: slope
CnD2	Severe: moderate permeability; slope; shallow to bedrock.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope. (Severe for subdivision because of slope.)	Severe: slope	Severe: slope
CoD3	Severe: moderate permeability; slope; shallow to bedrock.	Severe: slope; shallow to bedrock.	Severe: shallow to bedrock. (Severe for subdivision where slope is more than 12 percent.)	Moderate to severe: slope.	Severe: slope
CrD2	Severe: moderate permeability; shallow to bedrock; slope; rock outcrop.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; rock outcrop.	Severe: rock outcrop; slope.	Severe: rock outcrop; slope.
CsE3	Severe: moderate permeability; shallow to bedrock; slope; rock outcrop.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; rock outcrop; slope.	Severe: rock outcrop; slope.	Severe: rock outcrop; slope.
Crider: CtC	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope	Severe: slope
Dunning: Du	Severe: high water table; slow permeability; frequent flooding.	Severe: frequent flooding.	Severe: frequent flooding; frost action; high water table.	Severe: high water table.	Severe: high water table.
Eden:					
EeC3	Severe: slow permeability.	Severe: slope	Severe: moderate to high shrink-swell potential.	Severe: slow permeability; silty clay surface layer.	Severe: slow permeability; slope; silty clay surface layer.
EeE3, EfE3, EfF3	Severe: slow permeability; slope.	Severe: slope	Severe: moderate to high shrink-swell potential; slope.	Severe: slope; silty clay or clay surface layer; coarse fragments; slow permeability.	Severe: slope; silty clay or clay surface layer; coarse fragments; slow permeability.
EcF2	Severe: slow permeability; slope.	Severe: slope	Severe: moderate to high shrink-swell potential; slope.	Severe: slope; silty clay loam to clay surface layer; coarse fragments; slow permeability.	Severe: slope; silty clay loam to clay surface layer; coarse fragments; slow permeability.

for nonfarm and recreational uses—Continued

Roads and parking lots		Athletic fields (intensive use)	Play and picnic areas (extensive use)	Lawns, landscaping, and golf fairways	Sanitary land fill (trench method)
County and access roads	Streets and parking lots in subdivisions				
Moderate: shallow to bedrock.	Moderate: shallow to bedrock; slope.	Severe: slope	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.	Severe: shallow to bedrock.
Moderate: shallow to bedrock; slope.	Severe: slope	Severe: slope; shallow to bedrock.	Moderate: shallow to bedrock; slope.	Moderate: shallow to bedrock; slope.	Severe: shallow to bedrock.
Severe: slope	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.	Severe: slope	Severe: slope	Severe: shallow to bedrock; slope.
Moderate to severe: slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.	Moderate to severe: silty clay surface layer; slope.	Severe: silty clay surface layer; slope; effects of erosion.	Severe: shallow to bedrock; slope; silty clay surface layer.
Severe: shallow to bedrock; rock outcrop.	Severe: slope; shallow to bedrock; rock outcrop.	Severe: shallow to bedrock; slope; rock outcrop.	Severe: slope; rock outcrop.	Severe: shallow to bedrock; rock outcrop; slope.	Severe: shallow to bedrock; rock outcrop; silt loam surface layer; slope.
Severe: shallow to bedrock; rock outcrop; slope.	Severe: shallow to bedrock; rock outcrop; slope.	Severe: shallow to bedrock; rock outcrop; slope.	Severe: rock outcrop; slope; silty clay surface layer.	Severe: slope; shallow to bedrock; rock outcrop; silty clay surface layer; effects of erosion.	Severe: shallow to bedrock; rock outcrop; slope.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: high water table; frost action; frequent flooding.	Severe: high water table; frequent flooding; frost action.	Severe: high water table; frequent flooding.	Severe: high water table; frequent flooding.	Severe: high water table; frequent flooding.	Severe: high water table; frequent flooding; silty clay loam texture.
Severe: frost action; moderate to high shrink-swell potential.	Severe: moderate to high shrink-swell potential; frost action; slope.	Severe: slow permeability; silty clay surface layer; slope.	Severe: silty clay surface layer.	Severe: silty clay surface layer; effects of erosion.	Severe: clay texture.
Severe: moderate to high shrink-swell potential; frost action; slope.	Severe: moderate to high shrink-swell potential; slope; frost action.	Severe: slow permeability; silty clay or clay surface layer; slope; coarse fragments.	Severe: slope; silty clay or clay surface layer; coarse fragments.	Severe: slope; silty clay or clay surface layer; coarse fragments; effects of erosion.	Severe: slope; clay texture.
Severe: moderate to high shrink-swell potential; frost action; slope.	Severe: moderate to high shrink-swell potential; slope.	Severe: slow permeability; silty clay loam to clay surface layer; slope; coarse fragments.	Severe: slope; silty clay loam to clay surface layer; coarse fragments.	Severe: slope; silty clay loam to clay surface layer; coarse fragments; effects of erosion.	Severe: slope clay texture.

TABLE 7.—*Limitation of the soils*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Homes and recreation service buildings, with basements	Campsites (intensive use)	
				Tent sites	Trailer sites
Elk:					
EkA	Slight	Moderate: moderate permeability.	Slight	Slight	Slight
EkB	Slight	Moderate: moderate permeability; slope.	Slight	Slight	Moderate: slope
EkC	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope	Severe: slope
Fairmount:					
FaD	Severe: shallow to bedrock; slope; moderately slow permeability.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.
FfE	Severe: shallow to bedrock; moderately slow permeability; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope; coarse fragments.	Severe: shallow to bedrock; slope; coarse fragments.
FmD3	Severe: shallow to bedrock; moderately slow permeability; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock.	Severe: shallow to bedrock; clay surface layer; coarse fragments; slope.	Severe: shallow to bedrock; clay surface layer; coarse fragments; slope.
FmF3	Severe: shallow to bedrock; moderately slow permeability; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.	Severe: coarse fragments; shallow to bedrock; clay surface layer; slope.	Severe: coarse fragments; shallow to bedrock; clay surface layer; slope.
Faywood:					
FwC2	Severe: moderately deep to bedrock; moderately slow permeability.	Severe: moderately deep to bedrock; slope.	Severe: moderately deep to bedrock.	Moderate: moderately slow permeability; slope.	Severe: slope
FwD2	Severe: moderately deep to bedrock; moderately slow permeability; slope.	Severe: moderately deep to bedrock; slope.	Severe: moderately deep to bedrock; slope. (Severe for subdivision.)	Severe: slope	Severe: slope
FyD3	Severe: moderately deep to bedrock; moderately slow permeability.	Severe: moderately deep to bedrock; slope.	Severe: moderately deep to bedrock. (Severe for subdivision where slope is more than 12 percent.)	Moderate to severe: slope.	Severe: slope
Gullied land: Ga, Gc.					
Not rated.					

for nonfarm and recreational uses—Continued

Roads and parking lots		Athletic fields (intensive use)	Play and picnic areas (extensive use)	Lawns, landscaping, and golf fairways	Sanitary land fill (trench method)
County and access roads	Streets and parking lots in subdivisions				
Slight	Slight	Slight	Slight	Slight	Slight.
Slight	Moderate: slope	Moderate: slope	Slight	Slight	Slight.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope; clay texture.
Severe: shallow to bedrock; slope.	Severe: slope; shallow to bedrock.	Severe: shallow to bedrock; coarse fragments; slope.	Severe: slope; shallow to bedrock; coarse fragments.	Severe: slope; coarse fragments; shallow to bedrock.	Severe: slope; clay texture; shallow to bedrock.
Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; coarse fragments; slope; clay surface layer.	Severe: shallow to bedrock; clay surface layer; coarse fragments.	Severe: shallow to bedrock; clay surface layer; coarse fragments; slope; effects of erosion.	Severe: slope; clay texture; shallow to bedrock.
Severe: slope; shallow to bedrock.	Severe: slope; shallow to bedrock.	Severe: shallow to bedrock; slope; coarse fragments; clay surface layer.	Severe: slope; shallow to bedrock; coarse fragments; clay surface layer.	Severe: shallow to bedrock; clay surface layer; coarse fragments; slope; effects of erosion.	Severe: slope; clay texture; shallow to bedrock.
Severe: moderately deep to bedrock.	Severe: moderately deep to bedrock; slope.	Severe: slope; moderately deep to bedrock.	Moderate: moderately deep to bedrock; slope; silty clay loam surface layer.	Moderate: slope; silty clay loam surface layer.	Severe: moderately deep to bedrock; silty clay texture.
Severe: slope; moderately deep to bedrock.	Severe: slope; moderately deep to bedrock.	Severe: slope; moderately deep to bedrock.	Severe: slope	Severe: slope	Severe: moderately deep to bedrock; slope; silty clay texture.
Severe: slope; moderately deep to bedrock.	Severe: slope; moderately deep to bedrock.	Severe: slope; silty clay surface layer; moderately deep to bedrock.	Severe: slope; silty clay surface layer.	Severe: silty clay surface layer; slope; effects of erosion.	Severe: slope; silty clay texture; moderately deep to bedrock.

TABLE 7.—*Limitation of the soils*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Homes and recreation service buildings, with basements	Campsites (intensive use)	
				Tent sites	Trailer sites
Hagerstown:					
HaB	Moderate: moderate permeability.	Moderate: slope	Slight	Slight	Moderate: slope
HaC	Moderate: moderate permeability.	Severe: slope	Moderate: slope	Moderate: slope	Severe: slope
HgD3	Moderate: moderate permeability; slope.	Severe: slope	Moderate: slope. (Severe for subdivision where slope is more than 12 percent.)	Moderate to severe: slope.	Severe: slope
Huntington:					
HuA, Hv	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding	Moderate: flooding
HuC	Severe: flooding	Severe: flooding; slope.	Severe: flooding	Moderate: slope; flooding.	Severe: slope
Lawrence: Lc	Severe: high water table; slow permeability.	Slight	Severe: high water table; frost action.	Severe: high water table; slow permeability.	Severe: high water table; slow permeability.
Lindside: Ld	Severe: flooding	Severe: flooding	Moderate: flooding	Moderate: flooding; high water table.	Moderate: flooding; high water table.
Lowell:					
LwB	Severe: moderately slow permeability.	Moderate: slope	Moderate: moderate to high shrink-swell potential.	Moderate: moderately slow permeability.	Moderate: moderately slow permeability; slope.
LwC2	Severe: moderately slow permeability.	Severe: slope	Moderate: moderate to high shrink-swell potential; slope; depth to bedrock 4 to 6 feet.	Moderate: moderately slow permeability; slope.	Severe: slope
LwD2	Severe: moderately slow permeability; slope.	Severe: slope	Moderate: moderate to high shrink-swell potential; depth to bedrock 4 to 6 feet. (Severe for subdivision where slope is more than 12 percent.)	Severe: slope	Severe: slope
LyC3	Severe: moderately slow permeability.	Severe: slope	Moderate: moderate to high shrink-swell potential; depth to bedrock 4 to 6 feet; slope.	Moderate: moderately slow permeability; slope; silty clay loam surface layer.	Severe: slope
LyD3	Severe: moderately slow permeability; slope.	Severe: steepness of slope.	Moderate: moderate to high shrink-swell potential; depth to bedrock 4 to 6 feet; slope. (Severe for subdivision where slope is more than 12 percent.)	Severe: slope	Severe: slope

for nonfarm and recreational uses—Continued

Roads and parking lots		Athletic fields (intensive use)	Play and picnic areas (extensive use)	Lawns, landscaping, and golf fairways	Sanitary land fill (trench method)
County and access roads	Streets and parking lots in subdivisions				
Slight	Moderate: slope	Moderate: slope	Slight	Slight	Severe: silty clay texture.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope	Severe: silty clay texture.
Moderate to severe: slope.	Severe: slope	Severe: slope	Moderate to severe: slope; silty clay loam surface layer.	Moderate to severe: slope; silty clay loam surface layer; effects of erosion.	Severe: slope; silty clay texture.
Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding.
Severe: flooding	Severe: flooding; slope.	Severe: flooding; slope.	Severe: flooding	Severe: flooding	Severe: flooding.
Moderate: high water table; frost action.	Moderate: high water table; frost action.	Severe: high water table; slow permeability.	Moderate: high water table.	Moderate: high water table; moderately deep root zone.	Severe: high water table.
Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding.
Moderate: moderate to high shrink-swell potential.	Moderate: moderate to high shrink-swell potential; slope.	Moderate: slope	Slight	Slight	Severe: clay texture.
Moderate: moderate to high shrink-swell potential.	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope	Severe: clay texture.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope; clay texture.
Moderate: moderate to high shrink-swell potential.	Severe: slope	Severe: slope	Moderate: silty clay loam surface layer.	Severe: effects of erosion.	Severe: slope; clay texture.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope; effects of erosion.	Severe: silty clay texture; slope.

TABLE 7.—*Limitation of the soils for*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Homes and recreation service buildings, with basements	Campsites (intensive use)	
				Tent sites	Trailer sites
Markland: MkC	Severe: moderately slow permeability.	Moderate to severe: slope.	Moderate: moderate to high shrink-swell potential; slope.	Moderate: moderately slow permeability; slope.	Moderate to severe: slope.
MkD2	Severe: moderately slow permeability.	Severe: slope	Moderate: moderate to high shrink-swell potential; slope. (Severe for subdivision where slope is more than 12 percent.)	Severe: slope	Severe: slope
MlC3	Severe: moderately, slow permeability.	Severe: slope	Moderate: moderate to high shrink-swell potential; slope.	Severe: silty clay surface layer.	Severe: slope; silty clay surface layer.
MlD3	Severe: moderately slow permeability.	Severe: slope	Moderate: moderate to high shrink-swell potential; slope. (Severe for subdivision where slope is more than 12 percent.)	Severe: slope; silty clay surface layer.	Severe: slope; silty clay surface layer.
McGary: Mr	Severe: slow permeability; high water table.	Slight	Severe: high water table; moderate to high shrink-swell potential.	Severe: slow permeability; high water table.	Severe: slow permeability; high water table.
Melvin: Mt	Severe: high water table; very frequent flooding.	Severe: very frequent flooding.	Severe: high water table: very frequent flooding.	Severe: high water table.	Severe: high water table.
Newark: Ne	Severe: high water table; very frequent flooding.	Severe: very frequent flooding.	Severe: high water table; very frequent flooding.	Severe: high water table.	Severe: high water table.
Nicholson: NhB	Severe: slow permeability.	Moderate: slope.	Moderate: high water table.	Moderate: high water table; slow permeability in fragipan.	Moderate: high water table; slow permeability in fragipan.
Otway: OtC	Severe: moderately slow permeability; moderately deep to bedrock.	Severe: moderately deep to bedrock.	Severe: moderate to high shrink-swell potential.	Severe: moderately slow permeability.	Severe: moderately slow permeability; slope.
OtE	Severe: moderately slow permeability; moderately deep to bedrock.	Severe: slope; moderately deep to bedrock.	Severe: moderate to high shrink-swell potential; slope.	Severe: moderately slow permeability; slope.	Severe: moderately slow permeability; slope.

nonfarm and recreational uses—Continued

Roads and parking lots		Athletic fields (intensive use)	Play and picnic areas (extensive use)	Lawns, landscaping, and golf fairways	Sanitary land fill (trench method)
County and access roads	Streets and parking lots in subdivisions				
Moderate: moderate to high shrink-swell potential.	Moderate to severe: moderate to high shrink-swell potential; slope.	Moderate to severe: slope.	Slight to moderate: slope.	Slight to moderate: slope.	Severe: silty clay texture.
Severe: moderate to high shrink-swell potential; slope.	Severe: moderate to high shrink-swell potential; slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope; silty clay texture.
Severe: moderate to high shrink-swell potential.	Severe: moderate to high shrink-swell potential; slope.	Severe: slope; silty clay surface layer.	Severe: silty clay surface layer.	Severe: effects of erosion; silty clay surface layer.	Severe: silty clay texture.
Severe: moderate to high shrink-swell potential; slope.	Severe: moderate to high shrink-swell potential; slope.	Severe: silty clay surface layer; slope.	Severe: silty clay surface layer; slope.	Severe: silty clay surface layer; slope; effects of erosion.	Severe: slope; silty clay texture.
Severe: moderate to high shrink-swell potential; frost action.	Severe: moderate to high shrink-swell potential; frost action.	Severe: slow permeability; high water table.	Moderate: high water table.	Moderate: high water table.	Severe: high water table; clay texture.
Severe: high water table; very frequent flooding.	Severe: high water table; very frequent flooding.	Severe: high water table; very frequent flooding.	Severe: high water table; very frequent flooding.	Severe: high water table; very frequent flooding.	Severe: high water table; very frequent flooding.
Severe: very frequent flooding.	Severe: very frequent flooding.	Severe: high water table; very frequent flooding.	Severe: very frequent flooding.	Severe: very frequent flooding.	Severe: high water table; very frequent flooding.
Moderate: high water table.	Moderate: high water table.	Moderate: high water table; slow permeability in fragipan.	Slight	Slight	Moderate: high water table.
Severe: moderate to high shrink-swell potential; frost action.	Severe: moderate to high shrink-swell potential; frost action; slope.	Severe: moderately slow permeability; slope.	Moderate: silty clay loam surface layer; slope.	Moderate: silty clay loam surface layer; slope; moderately deep root zone.	Severe: clay texture.
Severe: moderate to high shrink-swell potential; slope; frost action.	Severe: moderate to high shrink-swell potential; slope; frost action.	Severe: moderately slow permeability; slope.	Severe: slope	Severe: slope	Severe: clay texture; slope.

TABLE 7.—*Limitation of the soils for*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Homes and recreation service buildings, with basements	Campsites (intensive use)	
				Tent sites	Trailer sites
Pembroke: PbA	Slight	Slight	Slight	Slight	Slight
PbB	Slight	Moderate: slope	Slight	Slight	Moderate: slope
PbC	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope	Severe: slope
PeC3	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope; silty clay loam surface layer.	Severe: slope
Robertsville: Rb	Severe: high water table; very slow permeability.	Moderate: unfavorable soil material.	Severe: high water table; frost action.	Severe: high water table; very slow permeability.	Severe: high water table; very slow permeability.
Rockcastle: RcD	Severe: shallow to bedrock; slow permeability; slope.	Severe: shallow to bedrock; slope.	Severe: shallow to shale. (Severe for subdivision where the slope is more than 12 percent.)	Severe: slope	Severe: slope
RcF, RlF. For Weikert part of RlF, see Weikert series.	Severe: shallow to bedrock; slow permeability; slope.	Severe: shallow to bedrock; slope.	Severe: slope; shallow to shale.	Severe: slope	Severe: slope
RkE3	Severe: shallow to bedrock; slow permeability; slope.	Severe: shallow to bedrock; slope.	Severe: slope; shallow to shale.	Severe: slope; silty clay surface layer.	Severe: slope; silty clay surface layer.
Rock land: Ro. For Corydon part, see Corydon series: CsE3.	Severe: shallow to bedrock; rock outcrop; slope; moderate to moderately slow permeability.	Severe: shallow to bedrock; slope.	Severe: rock outcrop; shallow to bedrock; slope.	Severe: slope; rock outcrop.	Severe: rock outcrop; slope.
Russellville: RuA	Severe: slow permeability in fragipan.	Slight	Moderate: high water table.	Moderate: high water table; slow permeability in fragipan.	Moderate: high water table; slow permeability in fragipan.
RuB	Severe: slow permeability in fragipan.	Moderate: slope	Moderate: high water table.	Moderate: high water table; slow permeability in fragipan.	Moderate: slope; high water table; slow permeability in fragipan.
Shelbyville: ShB	Moderate: moderately slow permeability below a depth of 30 inches.	Moderate: slope	Slight	Slight	Moderate: slope

nonfarm and recreational uses—Continued

Roads and parking lots		Athletic fields (intensive use)	Play and picnic areas (extensive use)	Lawns, landscaping, and golf fairways	Sanitary land fill (trench method)
County and access roads	Streets and parking lots in subdivisions				
Slight	Slight	Slight	Slight	Slight	Moderate: silty clay texture in lower part of the subsoil.
Slight	Moderate: slope	Moderate: slope	Slight	Slight	Moderate: silty clay texture in lower part of the subsoil.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope	Moderate: slope; silty clay texture in lower part of the subsoil.
Moderate: slope	Severe: slope	Severe: slope	Moderate: silty clay loam surface layer; slope.	Severe: effects of erosion.	Severe: silty clay loam surface layer.
Severe: high water table; frost action.	Severe: high water table; frost action.	Severe: high water table; very slow permeability.	Severe: high water table.	Severe: high water table; shallow root zone.	Severe: high water table.
Severe: slope; unstable; shallow to shale.	Severe: slope; unstable; shallow to shale.	Severe: slope	Severe: slope	Severe: slope	Severe: slope; clay.
Severe: slope; shallow to shale.	Severe: slope; shallow to shale.	Severe: slope	Severe: slope	Severe: slope	Severe: slope; clay texture.
Severe: slope; shallow to shale.	Severe: slope; shallow to shale.	Severe: slope; silty clay surface layer.	Severe: slope; silty clay surface layer.	Severe: slope; silty clay surface layer; effects of erosion.	Severe: slope; clay texture.
Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; rock outcrop; slope.	Severe: shallow to bedrock; rock outcrop; slope.	Severe: slope; rock outcrop.	Severe: slope; shallow to bedrock; rock outcrop.	Severe: slope; shallow to bedrock; rock outcrop.
Moderate: high water table.	Moderate: high water table.	Moderate: high water table; slow permeability in fragipan.	Slight	Slight	Moderate: high water table.
Moderate: high water table.	Moderate: high water table; slope.	Moderate: high water table; slow permeability in fragipan.	Slight	Slight	Moderate: high water table.
Slight	Moderate: slope	Moderate: slope	Slight	Slight	Moderate: clay in lower part of the subsoil.

TABLE 7.—*Limitation of the soils for*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Homes and recreation service buildings, with basements	Campsites (intensive use)	
				Tent sites	Trailer sites
Shrouts:					
SoC—For Otway part of this mapping unit, see Otway series, OtC.	Severe: shallow to bedrock; moderately slow permeability.	Severe: slope; shallow to bedrock.	Severe: moderate to high shrink-swell potential; shallow to shale.	Severe: silty clay surface layer; moderately slow permeability.	Severe: slope; silty clay surface layer; moderately slow permeability.
SoE—For Otway part of this mapping unit, see Otway series, OtE.	Severe: shallow to bedrock; moderately slow permeability; slope.	Severe: slope; shallow to bedrock.	Severe: moderate to high shrink-swell potential; slope; shallow to shale.	Severe: slope; silty clay surface layer; moderately slow permeability.	Severe: slope; silty clay surface layer; moderately slow permeability.
Tilsit:					
TlB	Severe: slow permeability in fragipan.	Moderate: slope; depth to bedrock.	Moderate: high water table.	Severe: slow permeability in fragipan.	Severe: slow permeability in fragipan.
TlC2	Severe: slow permeability in fragipan.	Severe: slope	Moderate: high water table; slope.	Severe: slow permeability in fragipan.	Severe: slope; slow permeability in fragipan.
Trappist:					
TpB, TpB2	Severe: moderately slow permeability; moderately deep to shale bedrock.	Severe: moderately deep to shale bedrock; moderately slow permeability.	Moderate: moderately deep to shale bedrock.	Moderate: moderately slow permeability.	Moderate: moderately slow permeability; slope.
TpC, TpC2	Severe: moderately deep to shale bedrock; moderately slow permeability.	Severe: moderately deep to shale bedrock; slope.	Moderate: slope; moderately deep to shale bedrock.	Moderate: slope; moderately slow permeability.	Severe: slope
TpD, TpD2	Severe: moderately deep to shale bedrock; moderately slow permeability; slope.	Severe: slope; moderately deep to shale bedrock.	Moderate: moderately deep to shale bedrock; slope. (Severe for subdivision where the slope is more than 12 percent.)	Severe: slope	Severe: slope
TrC3	Severe: moderately slow permeability; moderately deep to shale bedrock.	Severe: moderately deep to shale bedrock; slope.	Moderate: slope; moderately deep to shale bedrock.	Moderate: slope; moderately slow permeability; silty clay loam surface layer.	Severe: slope
TrD3	Severe: moderately deep to shale bedrock; moderately slow permeability; slope.	Severe: slope; moderately deep to shale bedrock.	Moderate: moderately deep to shale bedrock; slope. (Severe for subdivision where slope is more than 12 percent.)	Severe: slope	Severe: slope

nonfarm and recreational uses—Continued

Roads and parking lots		Athletic fields (intensive use)	Play and picnic areas (extensive use)	Lawns, landscaping, and golf fairways	Sanitary land fill (trench method)
County and access roads	Streets and parking lots in subdivisions				
Severe: frost action; poor workability; low stability.	Severe: frost action; poor workability; low stability.	Severe: moderately slow permeability; silty clay surface layer; slope.	Severe: silty clay surface layer.	Severe: silty clay surface layer; effects of erosion.	Severe: clay texture.
Severe: frost action; slope; poor workability; low stability.	Severe: frost action; slope; poor workability; low stability.	Severe: moderately slow permeability; silty clay surface layer; slope.	Severe: slope; silty clay surface layer.	Severe: slope; silty clay surface layer; effects of erosion.	Severe: clay texture; slope.
Moderate: high water table.	Moderate: high water table; slope.	Severe: slow permeability in fragipan.	Slight	Slight	Moderate: high water table.
Moderate: high water table; slope.	Severe: slope	Severe: slow permeability in fragipan.	Moderate: slope	Moderate: slope	Moderate: slope; high water table.
Moderate: moderately deep to shale bedrock.	Moderate: slope; moderately deep to shale bedrock.	Moderate: slope; moderately deep to shale bedrock; moderately slow permeability.	Slight	Slight	Moderate: moderately deep to shale bedrock.
Moderate: moderately deep to shale bedrock; slope.	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope; moderately deep to shale bedrock.	Moderate: moderately deep to shale bedrock.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: moderately deep to shale bedrock; slope.	Severe: slope	Severe: slope	Moderate: slope; silty clay loam surface layer.	Severe: effects of erosion.	Moderate: moderately deep to shale bedrock.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope; effects of erosion.	Severe: slope.

TABLE 7.—*Limitation of the soils for*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Homes and recreation service buildings, with basements	Campsites (intensive use)	
				Tent sites	Trailer sites
Trimble: TsB	Slight	Moderate: slope; moderate permeability; unfavorable soil material.	Slight	Moderate: coarse fragments.	Moderate: coarse fragments; slope.
TsC	Moderate: slope	Severe: slope	Moderate: slope	Moderate: coarse fragments; slope.	Severe: slope
TsD	Severe: slope	Severe: slope	Moderate: slope. (Severe for subdivision.)	Severe: slope	Severe: slope
TtD3	Severe: slope	Severe: slope	Moderate: slope. (Severe for subdivision.)	Severe: slope	Severe: slope
Weikert	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.
Whitley: WhB	Slight	Moderate: slope; moderate permeability.	Slight	Slight	Moderate: slope
WhC	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope	Severe: slope
WhD	Severe: slope	Severe: slope	Moderate: slope. (Severe for subdivision where the slope is more than 12 percent.)	Severe: slope	Severe: slope
Woolper: WoB	Severe: moderately slow permeability.	Moderate: slope	Moderate: moderate to high shrink-swell potential.	Moderate: moderately slow permeability; silty clay loam surface layer.	Moderate: slope; moderately slow permeability; silty clay loam surface layer.
WoC	Severe: moderately slow permeability.	Severe: slope	Moderate: moderate to high shrink-swell potential; slope.	Moderate: slope; moderately slow permeability; silty clay loam surface layer.	Severe: slope
WoD2	Severe: moderately slow permeability; slope.	Severe: slope	Moderate: moderate to high shrink-swell potential. (Severe for subdivision where the slope is more than 12 percent.)	Severe: slope	Severe: slope
Zanesville: ZaB	Severe: slow permeability in fragipan.	Moderate: slope	Moderate: high water table.	Moderate: high water table; slow permeability in fragipan.	Moderate: slope; high water table; slow permeability in fragipan.
ZaC2	Severe: slow permeability in fragipan.	Severe: slope	Moderate: high water table; slope.	Moderate: slope; high water table; slow permeability in fragipan.	Severe: slope

nonfarm and recreational uses—Continued

Roads and parking lots		Athletic fields (intensive use)	Play and picnic areas (extensive use)	Lawns, landscaping, and golf fairways	Sanitary land fill (trench method)
County and access roads	Streets and parking lots in subdivisions				
Slight	Moderate: slope	Moderate: coarse fragments; slope.	Slight	Slight. (Moderate for fairways because of coarse fragments.)	Moderate: coarse fragments.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: coarse fragments; slope.	Moderate: slope; coarse fragments.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: effects of erosion; slope.	Severe: slope.
Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.
Slight	Moderate: slope	Moderate: slope	Slight	Slight	Severe: depth to bedrock.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope	Severe: depth to bedrock.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope; depth to bedrock.
Severe: moderate to high shrink-swell potential; highly plastic.	Severe: moderate to high shrink-swell potential; slope; highly plastic.	Moderate: slope	Moderate: silty clay loam surface layer.	Moderate: silty clay loam surface layer.	Severe: silty clay texture.
Severe: moderate to high shrink-swell potential.	Severe: moderate to high shrink-swell potential; slope.	Severe: slope	Moderate: slope; silty clay loam surface layer.	Moderate: slope; silty clay loam surface layer.	Severe: silty clay texture.
Severe: slope; moderate to high shrink-swell potential.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: silty clay texture; slope.
Moderate: high water table.	Moderate: high water table; slope.	Moderate: slow permeability in fragipan; high water table.	Slight	Slight	Moderate: high water table.
Moderate: high water table.	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope	Moderate: high water table; slope.

and parking lots; athletic fields; play and picnic areas; lawns, landscaping, and golf fairways; and sanitary land fill.

The limiting effect of a property is greater at some sites than at others; consequently, a final decision on selecting a site for any of these uses should depend on a detailed field investigation. The most severe limitation can be overcome if someone is willing to pay the cost.

Degrees of limitation are slight, moderate, and severe. Slight indicates that the soil has few if any limitations, and that the limitations are easily overcome. Moderate indicates that careful planning, design, and management are needed to overcome or correct the limitations, and that the cost is considerable. Severe indicates that the cost of correction may be too high to be justified for the particular use. The limiting soil characteristics or properties are given only if the degree of limitation is moderate or severe.

The uses considered and the soil features evaluated in setting the degree of limitation are as follows:

Septic tank filter fields are drainage areas that are used to dispose of effluent from home septic tank systems. The degree of limitation is affected by permeability, slope, surface rockiness, flood hazard, depth to bedrock, and depth to seasonal water table. The possibility of polluting a water supply was not considered, but it would be a severe limitation.

Sewage lagoons are shallow ponds in which sewage is disposed of by means of oxidation. The degree of limitation depends on slope, depth to bedrock, availability of soil material suitable for reservoirs and embankments, permeability, and flood hazard. The possibility of polluting a water supply was not considered, but it would be a severe limitation.

Homes and recreational service buildings are assumed to be no more than three stories high and to have basements excavated to a depth of at least 5 feet below ground level. The degree of limitation depends on slope, depth to seasonal water table, depth to bedrock, presence of rock outcrops, flood hazard, hazard of frost action, and shrink-swell potential. Depth to bedrock and depth to the water table are less significant if the buildings have no basements. Problems of sewage disposal, water supply, access, and maintenance of vegetation were not considered.

Campsites are areas intended for camping in tents and small trailers. They are expected to be used frequently during the camping season and to be subjected to heavy foot traffic and vehicular traffic. They should provide accommodations for large groups of people and should have a picnic table, a fireplace, and an unsurfaced parking area at each site. Tent sites should have platforms, but parking areas may or may not be contiguous. At trailer sites, parking areas should be contiguous. The degree of limitation for campsites depends on depth to bedrock, permeability, depth to seasonal water table, presence of rock outcrops and coarse fragments, texture of the surface layer, flood hazard, and slope. Problems of sewage disposal, water supply, and access were not considered.

The degree of limitation for hard-surfaced roads and parking lots depends on slope, depth to bedrock, depth to seasonal water table, flood hazard, shrink-swell potential, hazard of frost action, stability, plasticity, depth to bedrock, and presence of rock outcrops. Slope is more significant in subdivisions than in open areas.

Athletic fields are used intensively for such sports as baseball, football, or volleyball and are subjected to heavy foot traffic. They need to be nearly level. The degree of limitation depends on slope, permeability, rockiness or stoniness, depth to bedrock, flood hazard, depth to seasonal water table, and texture of the surface layer. It was assumed that no fill or topsoil would be used.

Play areas are expected to be used extensively by children. Picnic areas are those equipped with tables and fireplaces for groups. The degree of limitation for these uses depends on slope, texture of the surface layer, flood hazard, depth to bedrock, surface stoniness, rockiness, and depth to seasonal water table. Problems of water supply and sewage disposal were not considered.

For lawns, landscaping, and golf fairways, it was assumed that the soil material at the site was to be used and that no fill or topsoil would be added. Traps and roughs are not considered part of the fairways. The degree of limitation depends on slope, texture of the surface layer, effects of erosion, flood hazard, surface stoniness, rockiness, depth to bedrock, depth to seasonal high water table, and depth of the root zone.

Sanitary land fill refers to areas used for disposal of trash and garbage. The degree of limitation depends on slope, permeability, texture, flood hazard, depth to bedrock, rock outcrops, and depth to seasonal high water table. The importation of fill or cover material was not considered.

Formation and Classification of the Soils

The first part of this section discusses the factors that affect soil formation, and the second part defines the categories in the system of soil classification and shows where the soils of Nelson County are placed in that system.

Factors of Soil Formation

Soils are formed by weathering and other processes that act on the parent material. The properties of the soil at any point on the earth depend on the combination of the following factors at that point: the physical and chemical composition of the parent material, the climate, the plant and animal life, the relief, and the time. These factors of soil formation are so closely interrelated that few generalizations can be made about the effect of one. The relative influence of each factor differs from place to place, and each modifies the effect of the other four. For example, the effects of climate and of plant and animal life are influenced by relief and by the nature of the parent material. In some places the influence of one factor is dominant.

In the following pages, the five major factors of soil formation are discussed in relation to their effects on the soils of Nelson County.

Parent material

Parent material is the unconsolidated mass from which a soil is formed. The three main kinds of parent material in Nelson County are material that weathered from rocks in place, material that was washed or moved by gravity from hillsides and accumulated on foot slopes, and material that was deposited by streams. A few soils on uplands formed partly from a mantle of loess-like material that was deposited over the material that weathered from the underlying rocks.

The rock formations in Nelson County generally occur as nearly level beds that dip slightly to the west. They represent the following four geologic periods: Ordovician, Silurian, Devonian, and Mississippian.

Most of the soils on the central, northern, and eastern uplands in Nelson County developed chiefly in material weathered from limestone and calcareous shale of the Ordovician and Silurian periods. Examples are Beasley, Lowell, Fairmount, and Eden soils, all of which have a clayey subsoil that is like the parent material. Otway soils, which developed in material weathered from calcareous shale, are clayey, are alkaline throughout, and are calcareous in some parts of the profile.

Soils that formed partly from loess-like material include Pembroke and Shelbyville soils. They have a more loamy and less clayey subsoil than Hagerstown and Lowell soils, which formed mainly in material weathered from limestone or limestone and shale.

The soils on the southern and western uplands in Nelson County developed mainly in material weathered from Devonian and Mississippian shale and sandstone. Attributed to shale parent material are the strong acidity, the high clay content, and the gray color of Rockcastle soils. Weikert soils, derived from shale and fine-grained sandstone, are coarser textured than Rockcastle soils.

The soils that formed in alluvium or a mixture of alluvium and colluvium have the same general composition as the soils on uplands. Many have a loamy texture; Huntington soils are examples. Woolper soils, which are on foot slopes, are more clayey. North and west of Boston are some fine-textured soils that formed almost entirely in clayey alluvium that probably settled from slack water. McGary and Markland soils are examples.

Climate

The soils in Nelson County formed in a temperate, moist climate. Temperature and rainfall have been favorable for the almost continuous weathering of rocks and minerals and for the leaching of soluble materials and fine particles. Soluble bases, such as calcium and magnesium, and clay minerals have been moved into the lower horizons or out of the soil altogether. As a result, Shelbyville, Lowell, and many other soils are acid in reaction and have a moderately high to high content of clay in the subsoil.

The climate is fairly uniform throughout the county and does not account for significant differences among soils.

Plant and animal life

The native vegetation of Nelson County was mostly mixed hardwood forest, but there were small canebrakes and glades.

Most of the soils in the county formed under hardwood forest. Such soils, if they have remained in woodland, have a thin dark-colored surface layer that is lower in organic-matter content than that of soils that formed under grass. If they are plowed, as the Lowell, Beasley, Bedford, and Trappist soils have been, the dark-colored layer is mixed with the lighter colored layer below it.

Shelbyville, Pembroke, and Otway soils have a thicker, somewhat darker colored surface layer than is usual in soils that formed under forest. Probably these soils formed in part under canes and grass.

Dunning and Woolper soils both have a thick dark-colored surface layer of organic-matter accumulation. Dunning soils formed under dense marsh vegetation, and the organic matter did not oxidize. Woolper soils have a surface layer of material moved from soils upslope.

Earthworms, insects, and other small animals mix soil material and add organic matter. Bacteria, fungi, and other micro-organisms break down plant and animal residues. These activities result in the release of minerals, the formation of humus, and the alteration of soil structure.

The greatest influence man has had in the formation of soils in this county has been through practices that result in accelerated erosion. Cultivation, drainage, irrigation, and the introduction of new plants will influence future soil development.

Relief

Relief affects soil formation mainly through its influence on the amount of rainfall that runs off and the amount that enters the soil.

The range in relief in Nelson County is from steep and strongly dissected to nearly level and gently undulating. In the Knobs Region, local differences in elevation are as much as 800 feet.

Strongly sloping to steep soils are likely to be shallow because much of the rainfall runs off and carries soil material with it and little water infiltrates and moves downward to cause leaching and translocation of clay. Colyer, Rockcastle, Fairmount, and Weikert soils are examples of strongly sloping to steep, shallow soils.

Gently sloping soils are likely to be deep and to have well-developed profiles. Enough rainfall infiltrates and percolates downward to cause pronounced leaching of the surface layer and an accumulation of clay in the subsoil. Geologic erosion is slower than soil formation. Also, plant growth is likely to be more luxuriant than on steeper slopes, so the effects of vegetation are more marked. Pembroke, Hagerstown, Shelbyville, and Lowell soils are examples of gently sloping, deep soils.

Nearly level or depressional soils are likely to be saturated for long periods, because nearly all the rainfall infiltrates and little runs off. Some areas receive additional water that runs off surrounding soils. The excessive amount of water restricts air movement, reduces iron compounds, and causes gray colors to develop in the subsoil. Lawrence, Robertsville, McGary, Newark, and Melvin soils are examples of nearly level and depressional soils that have been affected by excessive wetness. Lawrence and Robertsville soils have a fragipan, which is also a characteristic of several other nearly level to gently sloping soils in Nelson County.

Relief also modifies some of the effects of climate. Steep slopes that face north have lower soil temperatures than slopes that face south, because north slopes receive less heat from the sun. Also, temperatures are colder at the higher elevations. In Nelson County, slope direction and differences in elevation have had only a slight influence on soil-forming processes.

Time

The time required for a soil to form depends on the other soil-forming factors. Less time is required for a soil to form in a warm, moist climate than in a cool, dry climate. Some parent material is more resistant to the soil-forming processes than others. For example, quartz sand may change very little even if it is exposed for centuries. The relative degrees of profile development rather than the number of years a soil has been in the process of forming, determine the age of a soil. Pembroke soils, for example, are classified as older than Huntington soils because they are deep to bedrock, have distinct horizons, and have soil particles in a definite arrangement. Huntington soils are considered younger because they have only very faint horizons. They are on flood plains where alluvium still accumulates. Steep soils like those of the Rockcastle series do not have well-defined profiles because erosion removes soil almost as fast as it forms.

Classification of the Soils

Soils are classified so that we may more easily assemble knowledge about them, remember their significant characteristics, see their relationships to one another and to the whole environment, and develop principles that help us understand their behavior and response to manipulation (*6*). 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.

Two systems of classifying soils are used in the United States. The older of these systems was adopted in 1938 (*2*), and later revised (*14*). The current system (*16*) was placed in general use by the Soil Conservation Service in 1965 and is still being modified. The reader who is interested in the development of the current system should refer to the latest literature available (*13*).

Table 8 shows the classification of the soil series of Nelson County according to the current system and according to one major category of the 1938 system.

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria used as a basis for classification are soil properties that are observable or measurable. The properties are chosen, however, so that soils of similar genesis, or mode of origin, are grouped together. The classes in the current system are briefly defined in the following paragraphs.

ORDER.—Soils are grouped into orders according to properties that seem to have resulted from the same processes acting to about the same degree on the parent material. Ten orders are recognized: Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the orders are those that tend to give broad climatic groupings. Two exceptions, Entisols and Histosols, occur in many different climates.

As shown in table 8, four soil orders are represented in Nelson County: Inceptisols, Mollisols, Alfisols, and Ultisols.

Inceptisols have a surface layer that has been darkened to a depth of several inches by organic matter. The B horizon has uniform color, weak to moderate structure, and little, if any, accumulation of silicate clay. Some Inceptisols have a fragipan. The soils of this order range from very poorly drained to well drained. In Nelson County, the Inceptisols are represented by the following series: Colyer, Huntington, gravelly variant, Lindside, Melvin, Newark, Rockcastle, and Weikert.

Mollisols have a thick, friable, dark-colored surface layer. The B horizon has measurably more clay particles than the A horizon, and it has uniform color and weak to moderate structure. In Nelson County, the Mollisols are represented by the following series; Corydon, Dunning, Fairmount, Huntington, Otway, and Woolper.

Alfisols have a surface layer that has been darkened to a depth of several inches by organic matter. The B

TABLE 8.—*Classification of soil series into higher categories*

Series	Current system			Great soil groups according to the 1938 system
	Family	Subgroup	Order	
Baxter	Clayey, mixed, mesic	Typic Paleudults	Ultisols	Red-Yellow Podzolic soils.
Beasley	Fine, mixed, mesic	Typic Hapludalfs	Alfisols	Gray-Brown Podzolic soils.
Bedford	Fine-silty, mixed, mesic	Typic Fragiudults	Ultisols	Red-Yellow Podzolic soils with fragipan.
Colyer	Clayey-skeletal, mixed, mesic [1]	Lithic Dystrochrepts	Inceptisols	Lithosols.
Corydon	Clayey, mixed, mesic	Lithic Argiudolls	Mollisols	Red-Yellow Podzolic soils intergrading to Lithosols.

See footnotes at end of table.

TABLE 8.—*Classification of soil series into higher categories*—Continued

Series	Current system			Great soil groups according to the 1938 system
	Family	Subgroup	Order	
Crider	Fine-silty, mixed, mesic	Typic Paleudalfs	Alfisols	Red-Yellow Podzolic soils.
Dunning	Fine, mixed, noncalcareous, mesic.	Fluventic Haplaquolls	Mollisols	Humic Gley soils.
Eden	Fine, mixed, mesic	Typic Hapludalfs	Alfisols	Gray-Brown Podzolic soils intergrading to Lithosols.
Elk	Fine-silty, mixed, mesic	Ultic Hapludalfs	Alfisols	Gray-Brown Podzolic soils.
Fairmount	Clayey, mixed, mesic, shallow	Typic Hapludolls	Mollisols	Rendzinas.
Faywood	Fine, mixed, mesic	Typic Hapludalfs	Alfisols	Gray-Brown Podzolic soils intergrading to Lithosols.
Hagerstown	Fine, mixed, mesic	Typic Hapludalfs	Alfisols	Red-Yellow Podzolic soils intergrading to Reddish-Brown Lateritic soils.
Huntington	Fine-silty, mixed, mesic	Fluventic Hapludolls	Mollisols	Alluvial soils.
Huntington, gravelly variant.	Fine-loamy, mixed, mesic	Dystric Fluventic Eutrochrepts	Inceptisols	Alluvial soils.
Lawrence	Fine-silty, mixed, mesic	Aquic Fragiudalfs	Alfisols	Planosols with fragipan.
Lindside	Fine-silty, mixed, mesic	Aquic Fluventic Eutrochrepts	Inceptisols	Alluvial soils.
Lowell	Fine, mixed, mesic	Typic Hapludalfs	Alfisols	Gray-Brown Podzolic soils.
Markland	Fine, mixed, mesic	Typic Hapludalfs [2]	Alfisols	Gray-Brown Podzolic soils.
McGary	Fine, mixed, mesic	Aeric Ochraqualfs	Alfisols	Planosols with fragipan.
Melvin	Fine-silty, mixed, nonacid, mesic.	Fluventic Haplaquepts	Inceptisols	Low-Humic Gley soils.
Newark	Fine-silty, mixed, nonacid, mesic.	Aeric Fluventic Haplaquepts	Inceptisols	Alluvial soils intergrading to Low-Humic Gley soils.
Nicholson	Fine-silty, mixed, mesic	Typic Fragiudalfs	Alfisols	Gray-Brown Podzolic soils with fragipan.
Otway	Fine, carbonatic, mesic	Eutrochreptic Rendolls	Mollisols	Rendzinas.
Pembroke	Fine-silty, mixed, mesic	Mollic Paleudalfs	Alfisols	Red-Yellow Podzolic soils intergrading to Reddish-Brown Lateritic soils.
Robertsville	Fine-silty, mixed, mesic	Typic Fragiaquults	Ultisols	Planosols with fragipan.
Rockcastle	Fine, mixed, mesic	Typic Dystrochrepts	Inceptisols	Lithosols.
Russellville	Fine-silty, mixed, mesic	Typic Fragiudults	Ultisols	Red-Yellow Podzolic soils with fragipan.
Shelbyville	Fine-silty, mixed, mesic	Mollic Hapludalfs	Alfisols	Gray-Brown Podzolic soils.
Shrouts	Fine, mixed, mesic	Aquic Hapludalfs [3]	Alfisols	Solodized Solonetz soils.
Tilsit	Fine-silty, mixed, mesic	Typic Fragiudults	Ultisols	Red-Yellow Podzolic soils with fragipan.
Trappist	Clayey, mixed, mesic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Trimble	Fine-loamy, siliceous, mesic	Typic Paleudults	Ultisols	Red-Yellow Podzolic soils.
Weikert	Loamy-skeletal, mixed, mesic	Lithic Dystrochrepts	Inceptisols	Lithosols.
Whitley	Fine-silty, mixed, mesic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Woolper	Fine, mixed, mesic	Typic Argiudolls	Mollisols	Gray-Brown Podzolic soils.
Zanesville	Fine-silty, mixed, mesic	Typic Fragiudults	Ultisols	Red-Yellow Podzolic soils with fragipan.

[1] The Colyer soils in Nelson County have a fine-silty B horizon because of the influence of loess; but otherwise they are like all other Colyer soils.

[2] The description of the representative profile for the Markland soils in Nelson County shows that gray mottles occur higher up in the subsoil than is normal for the series. In all other characteristics, the Markland soils in Nelson County are like those within the normal range of the series.

[3] There is some evidence that the low-chroma mottles in the argillic horizon are inherited from the parent material. If so, in such places the subgroup is Typic Hapludalfs rather than Aquic Hapludalfs.

horizon has measurably more clay particles than the A horizon, uniform color, and moderate to strong structure. Some Alfisols have a fragipan. Base saturation is usually 40 to 70 percent. The soils in this order range from poorly drained to moderately well drained. In Nelson County, the Alfisols are represented by the following series: Beasley, Crider, Eden, Elk, Faywood, Hagerstown, Lawrence, Lowell, Markland, McGary, Nicholson, Pembroke, Shelbyville, and Shrouts.

Ultisols are soils that are highly developed but still contain weatherable materials. In Nelson County, Ultisols are represented by the following series: Baxter, Bedford, Robertsville, Russellville, Tilsit, Trappist, Trimble, Whitley, and Zanesville.

SUBORDER.—Each order is divided into suborders, primarily on the basis of soil characteristics that indicate genetic similarity. The climatic range is narrower than that permitted in the order. The soil properties considered are mainly those that reflect either the presence or absence of waterlogging or differences in climate or vegetation.

GREAT GROUP.—Each suborder is divided into great groups on the basis of uniformity in the nature of the major horizons and their sequence in the profiles. The horizons considered are those in which clay, iron, or humus has accumulated or those that have pans. The soil features considered are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly the content of calcium, magnesium, sodium, and potassium), and the like.

SUBGROUP.—Each great group is divided into subgroups, one representing the central (typic) concept of the group and others, called intergrades, that have properties of one great group and also one or more properties of another great group, suborder, or order. Subgroups may also be set up if soil properties intergrade outside the range of any other great group, suborder, or order.

FAMILY.—Families are established within subgroups, primarily on the basis of properties important to plant growth. Some of these properties are texture, mineralogy, reaction, soil temperature, permeability, consistence, and thickness of horizons.

SERIES.—The series category is described under the heading "How This Survey Was Made."

General Nature of the County

Nelson County was established by the Virginia Legislature in 1784, the fourth county created in Kentucky. The name is in honor of the Revolutionary General Thomas Nelson, a signer of the Declaration of Independence and a Governor of Virginia. The first settlement in Nelson County was established near Bardstown in 1775. Many of the early settlers emigrated from Virginia and Pennsylvania.

Physiography and Geology

Most of the western half of Nelson County is in the Knobs physiographic section; the extreme eastern part of the county is in the Hills of the Bluegrass section; and the rest of the area northeast of Bardstown is in the Outer Bluegrass section.

The geologic formations of Nelson County are of the Ordovician, Silurian, Devonian, and Mississippian Systems (*11*). The Ordovician rocks that underlie the Hills of the Bluegrass section are shale, limestone, and interbedded sandstone of the Eden Formation. The rocks that underlie the Outer Bluegrass section are thin-bedded Ordovician limestone and shale of the Maysville and Richmond Formations, and thick-bedded limestone and shale of the Silurian System. The New Albany Shale of the Devonian System and the New Providence Shale, Rosewood Shale, and Kenwood Sandstone of the Mississippian System underlie most of the Knobs Region. Under a few high ridges is Holtsclaw Sandstone overlain by a remnant of cherty limestone, also of the Mississippian System.

Relief and Drainage

The topography of the county ranges from nearly level to rolling and steep. The elevation ranges from 400 feet to more than 1,200 feet.

Conical hills and generally rough, broken, dissected relief characterize the Knobs Region, in the western part of the county. Narrow, steep-sided ridges rise as much as 400 feet above valley floors, and some peaks are even higher. At the lower elevations and on some of the broadest ridgetops there is some nearly level to gently rolling terrain. The broadest flood plain in this part of the county is that of Rolling Fork, which forms the southweastern boundary of the county.

The Outer Bluegrass Region extends northeast, northwest, and southeast of Bardstown to the county boundaries. This region has nearly level to rolling and steep uplands, narrow, steep-walled valleys, and, in some places, karst topography.

The Hills of the Bluegrass Region, in the extreme eastern part of the county, is strongly dissected by small streams and lateral drains. The valleys are very narrow and steep walled. The main ridges are long, narrow, and winding; short ridges extend laterally from the main ridges.

Climate [5]

This summary was prepared primarily from data recorded at Bardstown and is representative of this general area of Kentucky. Some of the figures in tables 9 and 10 are estimates based on data from other locations in this section of the State.

The climate of Nelson County is temperate. Generally, summers are warm and humid and winters are moderately cold. Precipitation is fairly well distributed throughout the year; there is no distinct wet season or dry season. Table 9 gives data on temperature and precipitation. Table 10 gives the probabilities of freezing temperatures after specified dates in the spring and before specified dates in the fall (*7*). The nighttime temperature drops to 32° or lower an average of 100 days, and a daily freeze-thaw cycle is normal. The daytime

[5] By ALLEN B. ELAM, JR., State climatologist, Environmental Science Services Administration, U.S. Weather Bureau.

TABLE 9.—*Temperature and precipitation*

Month	Temperature				Precipitation		
	Average daily maximum [1]	Average daily minimum [1]	Two years in 10 will have at least 4 days with [2]—		Average total [1]	One year in 10 will have [2]—	
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—
	°F.	°F.	°F.	°F.	In.	In.	In.
January	45. 8	26. 8	63	5	3. 86	1. 4	8. 5
February	50. 0	28. 4	67	10	3. 44	1. 1	5. 7
March	55. 9	33. 0	75	18	4. 01	2. 0	8. 5
April	70. 6	45. 3	84	30	3. 30	2. 0	6. 0
May	79. 0	53. 4	89	38	4. 26	1. 8	7. 5
June	86. 9	60. 9	95	52	4. 61	1. 8	7. 8
July	90. 2	64. 9	99	54	4. 69	2. 0	6. 5
August	89. 5	63. 2	96	54	2. 58	1. 4	5. 9
September	84. 9	56. 3	95	42	2. 71	. 9	5. 5
October	72. 0	43. 4	86	30	2. 67	. 9	4. 1
November	57. 3	32. 6	74	20	3. 66	1. 4	6. 0
December	49. 0	28. 8	64	10	3. 97	1. 6	6. 2

[1] Based on 1951–1960 records at Bardstown (elevation 637 feet).
[2] Based on 1951–1960 records at Bardstown and other locations.

temperature rises above freezing on all but 12 of these days. A temperature of 0° or lower occurs on an average of 1 day each winter. The average length of the growing season is about 180 days.

Annual rainfall totals, on the average, a little less than 44 inches. Rainfall is fairly evenly distributed through the year (see table 9). Precipitation of 0.1 inch or more occurs on an average of 80 days a year. At some time in almost every year, 1.2 inches or more of rain will fall in a 1-hour period. The chance that such a storm will occur in July is 30 percent, and the chance that one will occur between the first of December and the end of February is 1 percent. Once in 10 years, most commonly in July, at least 4.5 inches of rainfall in a 24-hour period can be expected. Low-intensity rainfall that lasts for several days late in spring may necessitate delay of planting. Soils that drain slowly and have a seasonal high water table, such as those of the Melvin and Robertsville series, are most likely to be affected.

Thunderstorms occur on an average of 48 days a year. They are most frequent between the first of March and the end of August but can occur in any month.

Fall typically brings long periods of mild weather favorable for harvesting crops.

Records on snowfall are incomplete, but the average is estimated to be 14 inches annually. About 5 days each year have a snowfall of 1 inch or more.

TABLE 10.—*Probabilities of last freezing temperatures in spring and first in fall*

Probability	Dates for given probability and temperatures		
	24° F. or lower	28° F. or lower	32° F. or lower
Spring:			
1 year in 10 later than	Apr. 12	Apr. 25	May 7
2 years in 10 later than	Apr. 6	Apr. 19	May 2
5 years in 10 later than	Mar. 25	Apr. 8	Apr. 22
Fall:			
1 year in 10 earlier than	Oct. 17	Oct. 9	Oct. 3
2 years in 10 earlier than	Oct. 23	Oct. 14	Oct. 8
5 years in 10 earlier than	Nov. 2	Oct. 23	Oct. 18

Vegetation

The native vegetation of Nelson County was predominantly deciduous trees, chiefly oak, hickory, maple, yellow-poplar, chestnut, cherry, and walnut. Vines and canes were common in open areas and along streams. Northern redcedar and Virginia pine were the only native conifers. Some broad-leaved evergreens, such as holly trees and magnolias, were scattered throughout the county, and there were a few grassy glades.

Nearly all of the level to rolling uplands and flood plains have been cleared and used for cultivated crops and pasture. Many steeply sloping soils and some less sloping, shallow soils have been cleared, but some of these soils have gradually reverted to forest, and others are brushland. Approximately 25 percent of the county is forested. The only large area of timberland is in the Knobs Region.

Farming

In 1964, approximately 82 percent of Nelson County was in farms, which averaged just under 148 acres in size.

The growing of row crops, hay, and pasture and the rais-

ing of livestock are the main farm enterprises. Corn and wheat are the principal grain crops. The acreage of grain crops has decreased in recent years. Burley tobacco, the chief cash crop, is grown on a small acreage on most farms.

Alfalfa, red clover, timothy, orchardgrass, and Korean lespedeza are the important hay crops. Small grain is used for hay on some farms. The most common pasture plants are Kentucky bluegrass, Kentucky 31 fescue, orchardgrass, and white clover. The acreage of hay and pasture has steadily increased since the 1930's.

Beef cattle, dairy cattle, and hogs are the common livestock. Two of these, or all three, are raised on some farms. The number of cattle and calves increased considerably between 1940 and 1950. Since 1950 there has been a steady increase in the number of dairy cows. The number of hogs and pigs on farms has increased only slightly since 1910. Horses and mules are used very little as work animals. Raising horses is not an enterprise except on one or two farms, but horses and ponies are kept on many farms for riding.

Feed for livestock consists chiefly of the crops produced on the farm, but on some farms byproducts from the distilleries are utilized for feed.

Industry and Trade

Although most of the people in Nelson County are engaged in farming, industry is also important to the economy. The principal industry is whisky distilling; 12 distilleries are located in the county. Other industries include clothing manufacture, milling, limestone quarrying, concrete mixing, contracting, trucking, and lumbering. Historic landmarks in the county attract tourists.

Bardstown, Bloomfield, and New Haven are the principal trading centers. Tobacco is marketed at Bloomfield. Louisville, 35 miles from Bardstown, is the principal market for livestock, dairy products, and other farm products.

Transportation

Transportation facilities include a network of Federal, State, and county highways that give access to nearly all parts of the county. Railway service and bus service are available. Small aircraft can land at the Nelson County Airfield, west of Bardstown.

Recreation

A state park, golf courses, swimming pools, and numerous small fishing lakes are among the recreational facilities within the county. Several large lakes are within driving distance.

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Glossary

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

Association, soil. A group of soils geographically associated in a characteristic repeating pattern.

Available moisture capacity. The capacity of a soil to store water that is available to plants. The classes used in this report refer to inches of water per 30 inches of rooting depth as follows: high—more than 3.9 inches; moderate—2.4 to 3.9 inches; low—1.8 to 2.4 inches; and very low—less than 1.8 inches.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. See flood plain.

Calcareous soil. A soil containing enough calcium carbonate (often with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid.

Cherty. Of a soil, containing angular fragments of rock, up to 3 inches in diameter.

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 clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

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

Complex, soil. A mapping unit consisting of different kinds of soils that occur in such small individual areas or in such an intricate pattern that they cannot be shown separately on a publishable soil map.

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; does not hold together in a mass.

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

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

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

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

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

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

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

Contour farming. Plowing, cultivating, planting, and harvesting in rows that are at right angles to the natural direction of the slope or that are parallel to terrace grade.

Cover crop. A close-growing crop grown primarily to improve and to protect the soil between periods of regular crop production; or a crop grown between trees and vines in orchards and vineyards.

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

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

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

Flaggy. Of a soil, containing flat fragments of rock, 6 to 15 inches long.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

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

Gravelly. Of a soil, containing rounded fragments less than 3 inches in diameter.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, covered by grass for protection against erosion; used to conduct surface water away from cropland.

Gully. A miniature valley with steep sides cut by running water, through which water ordinarily runs only after rains. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by normal tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage. V-shaped gullies result if the material is more difficult to erode with depth; whereas U-shaped gullies result if the lower material is more easily eroded than that above it.

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

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

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

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

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

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

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

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers, and by the height of the water table, either permanent or perched. Relative terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Minimum tillage. The minimum number of properly timed tilling operations essential to produce a specified crop.

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

Mulch planting. Planting row crops in grass, stubble, or crop residue without prior seedbed preparation, and performing subsequent tilling operations in a manner that will keep residue on or near the surface during the growing season.

Munsell notation. A system for designating color by degree of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

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

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

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

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

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

Imperfectly or somewhat poorly drained soils are wet for significant periods but not all the time, and commonly have mottlings below a depth of 6 to 16 inches, in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, but some are free of mottles or nearly so.

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

Parent material. The disintegrated and partly weathered rock from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Productivity (of soil). The present capability of a soil for producing a specified plant or sequence of plants under a specified system of management. It is measured in terms of output, or harvest, in relation to input of production for the specific kind of soil under a specified system of management.

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

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline.	91. and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Root zone. The part of the soil that is penetrated, or can be penetrated, by plant roots. Terms used in this survey for depth are: deep—36+ inches; moderately deep—20 to 36 inches; shallow—10 to 20 inches; very shallow—less than 10 inches.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.5 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

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

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

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

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

Substratum. Technically, the part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

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

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

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

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

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

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

Variegation. Contrasting color patches that vary in number and size; assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

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