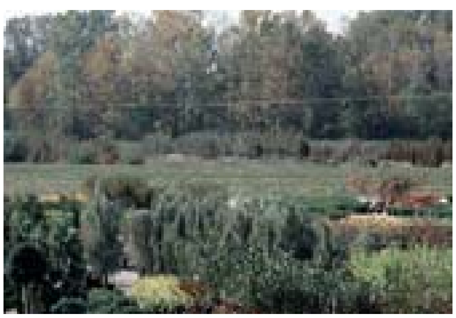
United States Department of Agriculture

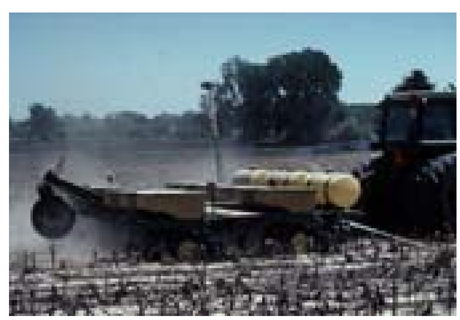
Natural Resources Conservation Service

In cooperation with Ohio Department of Natural Resources, Division of Soil and Water Conservation; Ohio Agricultural Research and Development Center; Ohio State University Extension; Delaware Soil and Water Conservation District; Delaware County Commissioners; and Delaware County Auditor

Soil Survey of Delaware County, Ohio





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How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

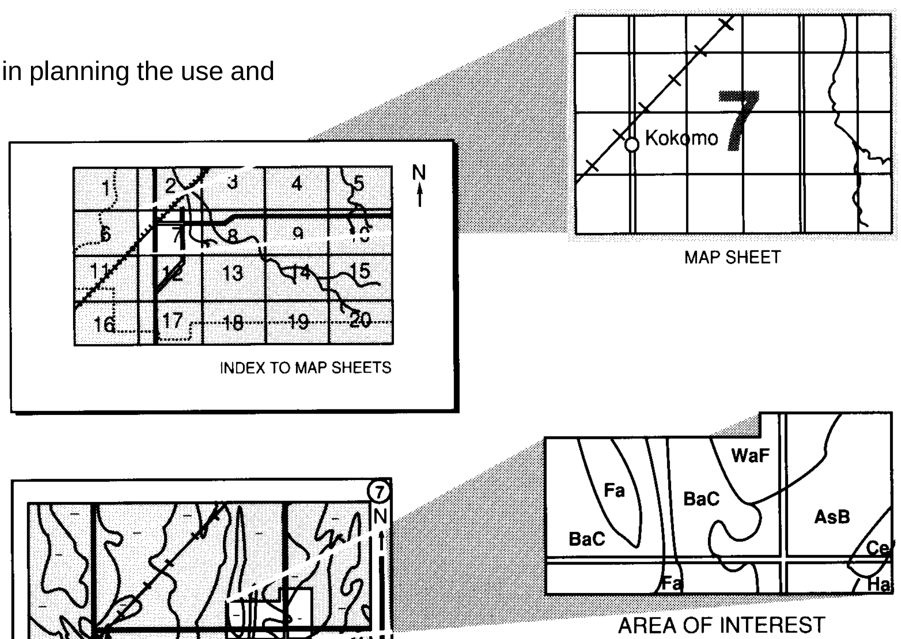
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1994. Soil names and descriptions were approved in 1996. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1994. This survey was made cooperatively by the Natural Resources Conservation Service; the Ohio Department of Natural Resources, Division of Soil and Water Conservation; the Ohio Agricultural Research and Development Center; the Ohio State University Extension; the Delaware Soil and Water Conservation District; the Delaware County Commissioners; and the Delaware County Auditor. The survey is part of the technical assistance furnished to the Delaware Soil and Water Conservation District. Financial assistance was provided by the Delaware County Commissioners and the Delaware County Auditor.

Cover (clockwise from upper left): A nursery in an area of the Bennington-Cardington-Pewamo association adjacent to Alum Creek; a farm pond in an area of the Cardington-Bennington-Pewamo association; prime farmland in an area of the Cardington-Bennington-Pewamo association being converted to multiple-family housing; planting soybeans with a no-till planter in the previous year's cornstalks; one of Delaware County's many golf courses in an area of the Bennington-Cardington-Pewamo association; Alum Creek Lake, which is used for flood control, as a municipal water source, and for recreation.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov.

Contents

How To Use This Soil Survey 3
Foreword 9
General Nature of the County 11
Climate 11
Physiography, Relief, and Drainage 12
Glacial Geology 12
Bedrock Geology 13
Natural Vegetation 13
Agriculture 14
Natural Resources 14
History and Development 15
Transportation Facilities 15
Recreation 15
How This Survey Was Made 16
Survey Procedures 17
General Soil Map Units 19
1. Glynwood-Blount-Pewamo Association 19
2. Blount-Pewamo-Glynwood Association 20
3. Scioto-Martinsville-Stone Association 21
4. Glynwood-Milton-Blount Association 22
5. Bennington-Cardington-Pewamo Association 22
6. Cardington-Bennington-Pewamo Association 24
7. Bennington-Centerburg-Pewamo Association 24
8. Bennington-Pewamo-Centerburg Association 25
Detailed Soil Map Units 27
AmD2—Amanda silt loam, 12 to 18 percent slopes, eroded 28
AmE—Amanda silt loam, 18 to 25 percent slopes 28
AmF—Amanda silt loam, 25 to 50 percent slopes 29
BeA—Bennington silt loam, 0 to 2 percent slopes 30
BeB—Bennington silt loam, 2 to 4 percent slopes 31
BoA—Blount silt loam, 0 to 2 percent slopes 32
BoB—Blount silt loam, 2 to 4 percent slopes 32
CaB—Cardington silt loam, 2 to 6 percent slopes 33
CaC2—Cardington silt loam, 6 to 12 percent slopes, eroded 33
CeB—Centerburg silt loam, 2 to 6 percent slopes 34
CeC2—Centerburg silt loam, 6 to 12 percent slopes, eroded 35
CnA—Condit silt loam, 0 to 1 percent slopes 35
EdA—Edwards muck, 0 to 1 percent slopes 36
GaC2—Gallman loam, loamy substratum, 6 to 12 percent slopes, eroded 36
GbA—Gallman silt loam, loamy substratum, 0 to 2 percent slopes 37
GbB—Gallman silt loam, loamy substratum, 2 to 6 percent slopes 37
GcB—Gallman silt loam, till substratum, 2 to 6 percent slopes 38
GwB—Glynwood silt loam, 2 to 6 percent slopes 38
GwC2—Glynwood silt loam, 6 to 12 percent slopes, eroded 40
GzC3—Glynwood silty clay loam, 6 to 12 percent slopes, severely eroded 40
HeF—Heverlo silt loam, 25 to 70 percent slopes 41
HyA—Hyatts silt loam, 0 to 2 percent slopes 41
HyB—Hyatts silt loam, 2 to 4 percent slopes 42
JmA—Jimtown silt loam, 0 to 2 percent slopes 42
LbF—Latham-Brecksville complex, 25 to 70 percent slopes 43
LeE—Leoni gravelly loam, 12 to 25 percent slopes 44
LoA—Lobdell silt loam, channery substratum, 0 to 2 percent slopes, occasionally flooded 45
LsA—Lobdell, channery substratum-Sloan, till substratum complex, 0 to 2 percent slopes, occasionally flooded 45
LvB—Loudonville silt loam, 2 to 6 percent slopes 46
LyD2—Lybrand silt loam, 12 to 18 percent slopes, eroded 47
LyE2—Lybrand silt loam, 18 to 25 percent slopes, eroded 48
LzD3—Lybrand silty clay loam, 12 to 18 percent slopes, severely eroded 48
MaB—Martinsville loam, 2 to 6 percent slopes 49

MbB—Martinsville loam, till substratum, 2 to 6 percent slopes ... 49
McD2—Mentor silt loam, 12 to 18 percent slopes, eroded ... 50
MfA—Millgrove silt loam, 0 to 2 percent slopes ... 50
MgA—Millgrove silty clay loam, 0 to 2 percent slopes ... 51
MhA—Millgrove silty clay loam, 0 to 2 percent slopes, rarely flooded ... 52
MoB—Milton silt loam, 2 to 6 percent slopes ... 52
MoC2—Milton silt loam, 6 to 12 percent slopes, eroded ... 53
MpD2—Milton-Lybrand complex, 12 to 18 percent slopes, eroded ... 53
PaA—Pacer silt loam, 0 to 2 percent slopes ... 54
PwA—Pewamo silty clay loam, 0 to 1 percent slopes ... 55
Pz—Pits, gravel ... 55
RdB2—Rarden silt loam, 2 to 6 percent slopes, eroded ... 56
RdC2—Rarden silt loam, 6 to 15 percent slopes, eroded ... 57
RdF2—Rarden silt loam, 20 to 50 percent slopes, eroded ... 57
RoA—Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded ... 58
RsA—Rossburg-Sloan complex, 0 to 2 percent slopes, occasionally flooded ... 59
ScA—Scioto silt loam, 0 to 2 percent slopes ... 59
ScB—Scioto silt loam, 2 to 6 percent slopes ... 60
SdC2—Scioto silty clay loam, 6 to 12 percent slopes, eroded ... 61
SfA—Scioto silt loam, 0 to 2 percent slopes, rarely flooded ... 61
SgA—Shoals silt loam, 0 to 2 percent slopes, occasionally flooded ... 62
SkA—Sloan silt loam, 0 to 2 percent slopes, occasionally flooded ... 62
SnA—Sloan silt loam, till substratum, 0 to 2 percent slopes, occasionally flooded ... 64
SoA—Sloan silty clay loam, till substratum, 0 to 2 percent slopes, occasionally flooded ... 64
SsA—Smothers silt loam, 0 to 2 percent slopes ... 65
SsB—Smothers silt loam, 2 to 4 percent slopes ... 65
StA—Stone silty clay loam, 0 to 2 percent slopes ... 66
SuA—Stone clay loam, 0 to 2 percent slopes, rarely flooded ... 67
Uc—Udorthents ... 67
UdB—Udorthents, clayey-Urban land complex, undulating ... 68
Up—Udorthents-Pits complex ... 68
Use and Management of the Soils ... 69
Crops and Pasture ... 69
Woodland Management and Productivity ... 78
Windbreaks and Environmental Plantings ... 79
Recreation ... 81
Wildlife Habitat ... 81
Hydric Soils ... 83
Engineering ... 84
Building Site Development ... 84
Sanitary Facilities ... 85
Construction Materials ... 86
Water Management ... 87
Waste Management ... 88
Water Quality ... 89
Soil Properties ... 91
Engineering Index Properties ... 91
Physical and Chemical Properties ... 92
Water Features ... 94
Soil Features ... 95
Physical and Chemical Analyses of Selected Soils ... 96
Classification of the Soils ... 97
Soil Series and Their Morphology ... 97
Amanda Series ... 98
Bennington Series ... 98
Blount Series ... 99
Brecksville Series ... 100
Cardington Series ... 101
Centerburg Series ... 102
Condit Series ... 103
Edwards Series ... 104
Gallman Series ... 104

Glynwood Series ... 105
Heverlo Series ... 106
Hyatts Series ... 107
Jimtown Series ... 108
Latham Series ... 109
Leoni Series ... 110
Lobdell Series ... 110
Loudonville Series ... 111
Lybrand Series ... 112
Martinsville Series ... 113
Mentor Series ... 114
Millgrove Series ... 115
Milton Series ... 116
Pacer Series ... 117
Pewamo Series ... 118
Rarden Series ... 119
Rossburg Series ... 120
Scioto Series ... 121
Shoals Series ... 122
Sloan Series ... 123
Smothers Series ... 124
Stone Series ... 124
Formation of the Soils ... 127
References ... 131
Glossary ... 133
Tables ... 145
Table 1.—Temperature and Precipitation ... 146
Table 2.—Freeze Dates in Spring and Fall ... 147
Table 3.—Growing Season ... 147
Table 4.—Acreage and Proportionate Extent of the Soils ... 148
Table 5.—Land Capability and Yields per Acre of Crops and Pasture ... 150
Table 6.—Yield Index ... 154
Table 7.—Main Cropland Limitations and Hazards ... 158
Table 8.—Capability Classes and Subclasses ... 167
Table 9.—Prime Farmland ... 168
Table 10.—Woodland Management and Productivity ... 169
Table 11.—Windbreaks and Environmental Plantings ... 183
Table 12.—Recreational Development ... 193
Table 13.—Wildlife Habitat ... 198
Table 14.—Building Site Development ... 202
Table 15.—Sanitary Facilities ... 208
Table 16.—Construction Materials ... 214
Table 17.—Water Management ... 219
Table 18.—Waste Management ... 226
Table 19.—Water Quality ... 230
Table 20.—Engineering Index Properties ... 233
Table 21.—Physical Properties of the Soils ... 252
Table 22.—Chemical Properties of the Soils ... 259
Table 23.—Water Features ... 266
Table 24.—Soil Features ... 269
Table 25.—Classification of the Soils ... 272
Interpretive Groups ... 273

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Foreword

This soil survey contains information that affects land use planning in Delaware County, Ohio. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils may be poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Kevin Brown
State Conservationist
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Soil Survey of Delaware County, Ohio

By Paul C. Jenny and Jeffrey A. Glanville, Natural Resources Conservation Service

Fieldwork by Paul C. Jenny and Jeffrey A. Glanville, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the Ohio Department of Natural Resources, Division of Soil and Water Conservation; the Ohio Agricultural Research and Development Center; the Ohio State University Extension; the Delaware County Soil and Water Conservation District; the Delaware County Commissioners; and the Delaware County Auditor

Delaware County is in central Ohio (fig. 1). It has a total area of 292,672 acres, or about 457 square miles. It is bounded by Marion and Morrow Counties on the north, Knox and Licking Counties on the east, Franklin County on the south, and Union County on the west. In 1990, the population of the county was 66,929 (U.S. Department of Commerce, 1990).

Most of the land is used for cash-grain farming. Large areas in the southern part of the county have been developed for housing and business.

This soil survey updates the survey of Delaware County, Ohio, published in 1969 (USDA, 1969). It provides additional information and has larger maps, which show the soils in greater detail.

Figure 1.—Location of Delaware County in Ohio.

General Nature of the County

This section provides general information about the survey area. It describes climate; physiography, relief, and drainage; glacial geology; bedrock geology; natural vegetation; agriculture; natural resources; history and development; transportation facilities; and recreation.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Delaware in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 27 degrees F and the average daily minimum temperature is 18 degrees. The lowest temperature on record, which occurred at Delaware on December 23, 1989, is -27 degrees. In summer, the average temperature is 70 degrees and the average daily maximum temperature is 82 degrees. The highest temperature on record, which occurred at Delaware on July 14, 1936, is 106 degrees.

Growing degree days are shown in table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 37.23 inches. Of this, 21.71 inches, or about 58 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall on record was 4.88 inches at Delaware on June 21, 1937. Thunderstorms occur on about 41 days each year, and most occur in July.

The average seasonal snowfall is 23.7 inches. The greatest snow depth at any one time during the period of record was 30 inches. An average of 9 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 8 inches.

The average relative humidity in midafternoon is about 59 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines about 60 percent of the time possible in summer and 36 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 10 miles per hour, in March.

Physiography, Relief, and Drainage

Delaware County is in the Central Lowland Province. The highest elevation, 1,239 feet above sea level, is in the northeast corner of Porter Township. The lowest elevation, 754 feet above sea level, is at the point where the Olentangy River enters Franklin County (Westgate, 1926).

The county is part of the upper Scioto drainage basin. The western and central parts of the county consist of an almost level plain at about 950 feet above sea level. This plain slopes slightly to the south. The eastern part of the county rises to about 1,200 feet along the boundary with Knox and Licking Counties (Westgate, 1926). The soils are dominantly nearly level and gently sloping. The natural surface drainage pattern is weakly expressed. Runoff commonly ponds in swales and depressions because few of the major streams have tributaries.

Glacial Geology

C. Scott Brockman, geologist, Ohio Department of Natural Resources, Division of Geological Survey, helped prepare this section.

Continental glaciers that spread over much of the northern United States advanced through Delaware County several times during the Pleistocene. About 130,000 years ago, a glacier of Illinoian age covered the county. Any Illinoian drift that had been deposited, however, was swept away or was buried by later glacial advances during the Wisconsinan Epoch. The last Wisconsinan glacier retreated from the survey area about 15,000 years ago.

Huge loads of debris consisting of boulders, cobbles, pebbles, sand, silt, and clay were deposited as the ice melted. These deposits are generally called drift. The thickness of the drift ranges from a few inches to more than 200 feet. The drift generally ranges from 20 to 80 feet in thickness. Deep wells have revealed the thickness of the drift intermixed with lenses of sand and gravel to be 175 feet in buried valleys in the western part of the county. In the eastern part the drift is as much as 240 feet thick in buried valleys.

Materials in the drift were derived from the bedrock and soils over which the glaciers passed. Most of the material was of local origin, although many rocks and other material had been carried hundreds of miles by the ice. The drift in the county originated from local limestone, sandstone, and shale, which are subject to weathering, and from granite, quartzite, and other crystalline rocks from the Canadian highlands, which are more resistant to weathering. Soils derived from drift parent materials generally contain greater amounts of calcium carbonate (lime) in the western third of the county than elsewhere because of the limestone bedrock that directly underlies the drift in this part of the county.

Till is a particular type of drift made up of a compact and heterogeneous mass of unsorted sand, silt, clay, pebbles, and cobbles and a few boulders. It formed at the bottom of glaciers and from in-place melting of sediment-laden ice. Irregular and commonly unpredictable lenses of sorted sand, silt, clay, or gravel can also occur within till. Unweathered or unoxidized till is gray because of unoxidized minerals, such as iron. When this till later becomes oxidized, its color changes to yellowish brown, mostly because of the rust color of the iron. As till weathers, carbonates of calcium and magnesium are leached by water and redeposited at greater depths or continue to be held by ground water.

The term “ground moraine” applies to a till-mantled land surface that is relatively smooth and has little topographic relief. Most of the county is ground moraine.

End moraines are hummocky or hilly belts of till, commonly formed at the front of a stalling ice sheet. The Broadway Moraine is a belt 3 to 6 miles wide that generally enters the county at Ostrander and continues northeast to the Morrow County line just north of Kilbourne. The narrow Powell Moraine extends generally northeast from Powell to Sunbury and then along the west side of Big Walnut Creek to the Morrow County line. These end moraines are mostly continuous along the former ice front; in some areas they are not very pronounced or are discontinuous as the result of nondeposition or stream dissection.

While glaciers covered Delaware County, periods of relatively warm weather caused some debris-filled ice to melt. As meltwater poured from the glaciers, a system of streams and rivers formed. Temporary lakes formed where outlets were blocked. The meltwater carried large quantities of rock fragments. Cobbles, pebbles, and coarse sands were deposited by swift water, and the finer sands were deposited by the more slowly moving water. These particular drift deposits are known as glaciofluvial deposits. Silts and clays settled out in quiet waters in temporary lakes or ponded areas. These materials are known as lacustrine deposits.

Lacustrine deposits occur on only a few low terraces along Alum Creek. These terraces are submerged under Alum Creek Lake. Glaciofluvial deposits, however, occur along all the major streams and some of their tributaries. These deposits are on stream bottoms below recent alluvium and are on several terrace levels along these streams. The outwash deposits contain large amounts of rounded limestone fragments along the Scioto and Olentangy Rivers. They contain large amounts of rounded shale fragments and some sandstone fragments along Alum Creek and Big Walnut Creek. Other glaciofluvial deposits in the county are on kames and eskers. Kames are prominent moundlike knolls or hills that were deposited by sediment-laden streams in crevasses in the ice or at the edge of stagnant ice. A number of conspicuous hills, some as high as 50 feet above the surrounding ground moraine, are southeast of the Powell end moraine in Trenton Township between Perfect and Rattlesnake Creeks. Kames on the north side of the Broadway end moraine near Radnor can be distinguished from rolling morainal hills by their sandy and gravelly composition.

Eskers are short to long ridges of sand and gravel that were deposited by streams flowing in tunnels within or beneath the ice. A double line of eskers extends from just south of Prospect to several miles south of Radnor. These eskers are some of the best examples in Ohio. They are generally 20 to 40 feet high and 150 to 250 feet wide. They are discontinuous in places but are as much as a mile long elsewhere. Gradational forms, such as kame-esker complexes, and forms partially buried by outwash are also present in Radnor Township. A possible example of the latter was excavated near the intersection of River Road and Mink Street Road near the Scioto River. It contains large, slightly stream-smoothed limestone boulders but has no obvious ridge-like form.

Bedrock Geology

C. Scott Brockman, geologist, Ohio Department of Natural Resources, Division of Geological Survey, helped prepare this section.

Delaware County is underlain by sedimentary rocks, such as limestone (fig. 2), shale, and sandstone. These rocks were originally horizontally bedded but presently dip slightly to the east at about 25 feet per mile. Consequently, the rock formations occupy roughly north-south belts. The lowest and oldest rocks are on the west side of the county, and the stratigraphically higher and younger rocks are found successively to the east.

The oldest rocks exposed at the surface consist of dolostones of the Salina group of Silurian age (about 410 million years old). Proceeding to the east and higher in the geologic column are the Devonian Columbus and Delaware limestone and the Olentangy, Ohio, and Bedford shales (about 380 million years old). The youngest rocks are the Mississippian (about 350 million years ago) Berea sandstone, the Sunbury shale, and the Cuyahoga Formation, which is a unit of fine grained sandstone and siltstone alternating with soft shale. An easily observable exposure of Ohio shale is on the east side of Alum Creek Lake where U.S. Highway 36/Ohio Highway 37 crosses just west of the I-71 interchange. An easily observable exposure of Columbus limestone is at the junction of Mill Creek and the Scioto River at Bellpoint.

Natural Vegetation

Most of Delaware County was originally woodland. The dominant species were oaks, hickory, walnut, ash,

Figure 2.—Glynwood silt loam, 2 to 6 percent slopes, is underlain by limestone bedrock at Penry Stone Quarry.

birch, and sugar maple (Perrin and Battle, 1880).

At least one large area of the county is believed to have been a prairie. It was covered by prairie grasses instead of trees and was a remnant of an earlier, drier climate.

There are a few small areas of muck in the county. These soils formed in low-lying swampy areas from decomposed vegetation and the remains of the shells of aquatic animals. These areas are still saturated with water or are ponded much of the year, and in their original state they probably supported sedges, rushes, and other wetland vegetation.

Agriculture

Agriculture is the primary land use in Delaware County. In 1990, 840 farms made up 182,000 acres in the county, or 64 percent of the land area (Crawford, 1992). The main area in which agricultural land is being converted to other uses, primarily residential development, is in the southern part of the county.

Cash grain farms and livestock operations are the main types of farms. There are a few dairy farms. The main crops are corn, soybeans, wheat, and hay. Nurseries and small horse farms are also in the county. Minor products include vegetables, other specialty crops, and exotic animals.

Natural Resources

The natural resources in Delaware County include water, sand and gravel deposits, and some layers of bedrock.

Delaware County has a good supply of surface water and an excellent to poor supply of ground water, depending upon location. Although adequate supplies of ground water for farm and domestic needs are available in some parts of the county, an adequate supply should be established before buildings are constructed.

Water supplies for both Delaware County and Franklin County are obtained from the O’Shaughnessy Reservoir on the Scioto River, Alum Creek Lake on Alum Creek, and the Hoover Reservoir on Big Walnut

Creek. The city of Delaware obtains its water from the Olentangy River just below Delaware Lake. Delaware Lake is a flood-control structure on the Olentangy River near the Marion County line.

The quality and quantity of ground water are largely determined by the type of aquifer that supplies the water.

Wells that yield 100 to more than 500 gallons per minute are in the western third of the county (Schmidt, 1979). These wells are drilled into limestone formations beneath 5 to 85 feet of till and into the relatively shallow valleys of the Scioto and Olentangy Rivers, which contain deposits of permeable sand and gravel.

Wells producing 25 gallons or more per minute are in the eastern third of the county (Schmidt, 1979). These wells are drilled into sandstone formations beneath 10 to 60 feet of till.

Wells that yield 5 to 15 gallons per minute are drilled into buried pre-glacial valleys in the southern two-thirds of the county (Schmidt, 1979). These buried valleys, as much as 240 feet deep, are filled with till that is interbedded with thin lenses of sand and gravel.

Wells that yield 3 gallons per minute or less are in the central third of the county in a north-south belt between Delaware and Sunbury (Schmidt, 1979). These wells are drilled into till underlain with shale bedrock. Few of these wells are more than 75 feet deep, and deeper wells often include brackish and salty water. Just east of the Olentangy River, wells have been drilled into limestone formations beneath the shale bedrock. Although yields in excess of 400 gallons per minute have been produced, specialized well construction methods that seal off shale and surficial limestone have failed to improve water quality (Schmidt, 1979). For these reasons, the Delaware County Water Authority (DELCO) provides water for domestic use to portions of this area from surface-water supplies obtained from Alum Creek Lake.

Wells drilled into the Broadway and Powell end moraines produce from 3 to 10 gallons per minute (Schmidt, 1979). Thin lenses of sand and gravel interbedded in the till represent the only good source of water for domestic supplies in the central third of the county.

Sand and gravel for local usage have been mined in the past from terraces along the major streams and from kames and eskers.

Rock quarries have provided building stone in the past, mainly from the Delaware limestone formation. Crushed limestone is still mined from four quarries near the Scioto River.

History and Development

The first settlers in the area that is now Delaware County were probably the Mound Builders (Lytle, 1908; Perrin and Battle, 1880). Later, and until the beginning of the 1800's, the Delaware and Mingo tribes were the area's main inhabitants (Buckingham, 1976; Lytle, 1908; Perrin and Battle, 1880). Other inhabitants included the Shawnee, Wyandot, and Seneca tribes (Buckingham, 1976; Lytle, 1908; Perrin and Battle, 1880). The first European settlement was in 1801 (Buckingham, 1976; Perrin and Battle, 1880). After the Treaty of Greenville was signed in 1814, there was a flood of settlers, mainly of European descent, and most of the Delawares left the county (Perrin and Battle, 1880).

Delaware County was formed in 1808, and its present boundaries were established in 1848 (Buckingham, 1976).

Agriculture is still the primary industry in the county. Light manufacturing and service industries are important in Delaware and Sunbury and in the southern part of the county, which has also been developed heavily for residential use. Reservoirs have been built on each of the county's four major waterways to provide water, flood protection, and recreation for Delaware and Franklin Counties.

In 1810, the population of the county was 2,000. In 1990, the population was 66,929 (U.S. Department of Commerce, 1990). Sunbury, Powell, and Ashley and the Franklin County municipalities of Dublin and Westerville all have a population of more than 1,000.

Transportation Facilities

Interstate 71 and U.S. Highways 23, 36, and 42 pass through the county. State highways and a system of well paved county and township roads provide easy access to all areas of the county.

Three railroad lines run north and south through the county. All three lines pass through Delaware.

Delaware Airport is in the southwestern part of the city.

Recreation

Recreational areas in the county include Alum Creek Lake and Alum Creek State Park, Delaware Reservoir, Delaware State Park and Delaware State Wildlife Area, and Hoover and O'Shaughnessy Reservoirs. Highbanks Nature Preserve, the Columbus Zoo, and Wyandot Lake, an amusement park and water park, are in the southern part of the county. Recreation Unlimited is a 160-acre camping and recreational area for people with disabilities. There are several city parks in Delaware. The county has many golf courses.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Some soil boundaries and soil names on the maps in this survey area do not fully match those on the maps for the adjacent survey areas that were published at an earlier date. Differences are the result of changes and refinements in soil series concepts, changes in soil taxonomy, and slight variations in the composition of the map units in the survey areas. Also, the State Soil Geographic data (STATSGO) map was used as the base for the general soil map in this publication.

Survey Procedures

The general procedures followed in making this survey are described in the National Soil Survey Handbook of the Natural Resources Conservation Service. “Soil Survey of Delaware County, Ohio” (USDA, 1969) and “Geology of Delaware County” (Westgate, 1926) were among the references used.

Prior to the soil survey modernization, a soil survey review team conducted an evaluation of the 1969 survey of Delaware County at the request of the Delaware County Commissioners. A report of the evaluation was prepared and sent to the Soil Inventory Board for review. After reviewing the evaluation report, the Soil Inventory Board recommended a soil survey modernization program and outlined the work to be completed.

Before the fieldwork began, a detailed study of all existing laboratory data, soil survey reports, and research studies was conducted by the Delaware County soil survey staff. U.S. Geological Survey topographic maps, at a scale of 1:24,000, were used by the soil scientists to relate land and image features.

There is a large number of soil series in Delaware County. The 1969 soil survey is a valuable historical document that was relied on extensively during the modernization process. Patterns within the soil landscape are commonly complex. Modern soil survey procedures differ from those practiced during the earlier survey. Some soil series names used in the former report no longer apply to the soils that were mapped and correlated during the modernization project. Soil scientists making the 1969 survey did not recognize all of the soil series that soil scientists identify today using the modern soil taxonomy and classification system. In addition, soil observations and evaluations during the 1969 survey were made to a depth of only 60 inches, whereas during the modernization project the soils were evaluated to a depth of 80 inches.

Recent aerial photographs, photographs from earlier flights, various geology maps, and the United States Geological Survey quadrangles were used in making the survey. The maps and soil descriptions in the 1969 survey were used as references in the correlation of soil series and map units. The old survey was also used to determine the areas of highest variability when mapping and transect intervals were planned.

A reconnaissance was made by vehicle before the soil scientists traversed the surface on foot and examined the soils. Maps of the area east of Hoover Reservoir and areas of alluvial and outwash soils were determined to be the least reliable.

Transects were made, and notes were taken that would help to determine the composition of all of the map units in the county. Most transects consisted of a series of ten soil borings in a straight line from one edge of the map unit to the other edge. The borings were spaced as much as about 200 feet apart. Transects were oriented perpendicular to landscape features in areas where soil patterns might follow those features, such as on a flood plain or outwash terrace, or across a steep valley. Transects were oriented randomly in areas with few landform features, such as on a flat till plain, or where landscape features are not linear, such as on a rolling till plain. Observations of such items as landforms, vegetation, erosion, ditchbanks, and surface colors were made without regard to spacing. Soil boundaries were determined on the basis of soil examinations, observations, and photo interpretation. The soil material was examined to a depth of about 80 inches or to bedrock if within a depth of 80 inches. The soils described as typical were observed and studied in pits that were dug with shovels and spades.

Samples for chemical and physical analyses were taken from representative sites of several of the soils in the county. The chemical and physical analyses were made by the Soil Characterization Laboratory, School of Natural Resources, The Ohio State University, Columbus, Ohio. The results of the analyses are stored in a computerized data file at the laboratory. The laboratory procedures can be obtained on request from the laboratory. The results of the analyses can be obtained from the School of Natural Resources, The Ohio State University; the Ohio Department of Natural Resources, Division of Soil and Water Conservation; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

After completion of the fieldwork, map unit delineations were transferred by hand to another set of photographs. Surface features were recorded from observation of the maps and the landscape.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. These areas are called associations. Each association on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils or miscellaneous areas. It is named for the major soils. The components of one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Glynwood-Blount-Pewamo Association

Very deep, level to strongly sloping soils that formed in till

Setting

Landform: Ground moraines, end moraines (fig. 3)
Slope range: 0 to 12 percent
Landscape features: Low rises, a few depressions, and a few knolls

Composition

Percent of the survey area: 26
Extent of the soils in the association:
Glynwood soils—42 percent
Blount soils—19 percent
Pewamo soils—11 percent
Minor soils—28 percent

Soil Properties and Qualities

Glynwood

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits, shoulders, backslopes
Parent material: Till
Surface textural class: Silt loam, silty clay loam
Slope range: 2 to 12 percent
Permeability: Slow or very slow
Available water capacity: Low

Blount

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Slight rises, flat areas, knolls, areas of swell-and-swale topography, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 0 to 4 percent
Permeability: Slow or very slow
Available water capacity: Moderate

Pewamo

Depth class: Very deep
Drainage class: Very poorly drained
Position on the landform: Depressions, flat areas, drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope range: 0 to 1 percent
Permeability: Moderately slow
Available water capacity: High

Minor Soils

- Rossburg and Sloan soils on flood plains
- Scioto soils on outwash terraces
- Lybrand soils in dissected areas along streams

Figure 3.—An area of Pewamo silty clay loam, 0 to 1 percent slopes, is on the ground moraine in the foreground. Glynwood silt loam, 2 to 6 percent slopes, is on the end moraine in the background.

Use and Management

Major uses: Agriculture
Management concerns: Wetness, erosion, permeability

2. Blount-Pewamo-Glynwood Association

Very deep, level to strongly sloping soils that formed in till

Setting

Landform: Ground moraines
Slope range: 0 to 12 percent
Landscape features: Low rises, a few depressions, and a few knolls

Composition

Percent of the survey area: 31
Extent of the soils in the association (fig. 4):
Blount soils—40 percent
Pewamo soils—38 percent
Glynwood soils—14 percent
Minor soils—8 percent

Soil Properties and Qualities

Blount

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Slight rises, flat areas, knolls, areas of swell-and-swale topography, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 0 to 4 percent
Permeability: Slow or very slow
Available water capacity: Moderate

Pewamo

Depth class: Very deep
Drainage class: Very poorly drained
Position on the landform: Depressions, flat areas, drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope range: 0 to 1 percent
Permeability: Moderately slow
Available water capacity: High

Glynwood

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits, shoulders, backslopes
Parent material: Till
Surface textural class: Silt loam, silty clay loam
Slope range: 2 to 12 percent
Permeability: Slow or very slow
Available water capacity: Low

Minor Soils

- Sloan and Rossburg soils on flood plains
- Lybrand soils in dissected areas along streams

Use and Management

Major uses: Agriculture
Management concerns: Wetness, erosion, permeability

3. Scioto-Martinsville-Stone Association

Very deep and deep, level to strongly sloping soils that formed in outwash and in drift overlying limestone or dolostone

Setting

Landform: Eskers, kames, outwash terraces, ground moraines, abandoned stream terraces, outwash plains
Slope range: 0 to 12 percent
Landscape features: A few old gravel pits, long rises, and high knolls

Composition

Percent of the survey area: 2
Extent of the soils in the association:
Scioto soils—36 percent
Martinsville soils—25 percent
Stone soils—11 percent
Minor soils—28 percent

Soil Properties and Qualities

Scioto

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Summits, shoulders, flat areas, rises, backslopes
Parent material: Outwash
Surface textural class: Silt loam, silty clay loam
Slope range: 0 to 12 percent
Permeability: Moderate or moderately slow in the upper part of the subsoil; moderate or moderately rapid in the lower part of the subsoil and in the substratum
Available water capacity: Low

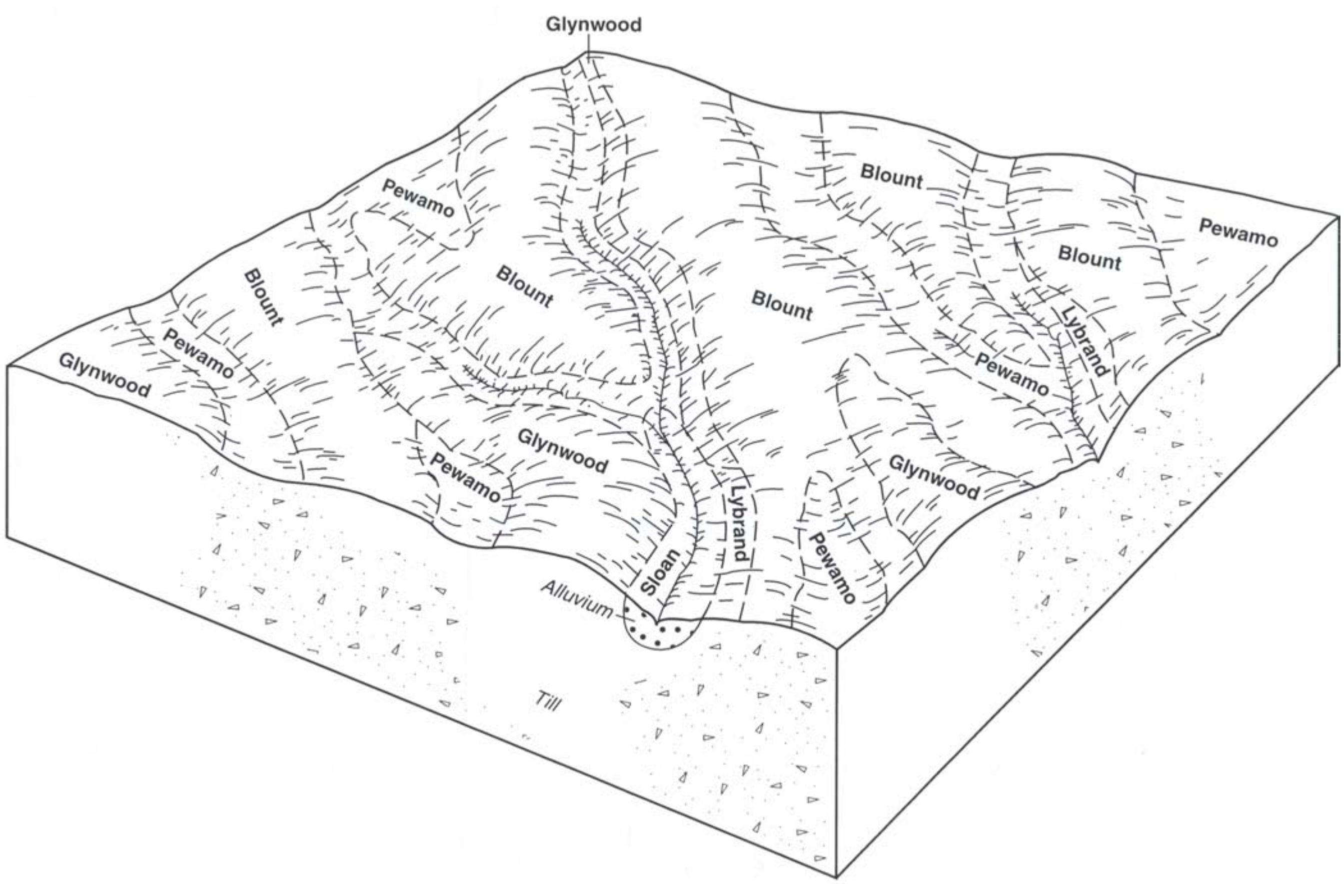

Figure 4.—Typical pattern of soils and parent material in the Blount-Pewamo-Glynwood association.

Martinsville

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Summits, shoulders, backslopes
Parent material: Outwash; outwash overlying till in the till substratum phase
Surface textural class: Loam
Slope range: 2 to 6 percent
Permeability: Moderate
Available water capacity: High

Stone

Depth class: Deep
Drainage class: Somewhat poorly drained
Position on the landform: Flat areas, depressions
Parent material: Drift overlying limestone or dolostone
Surface textural class: Silty clay loam, clay loam
Slope range: 0 to 2 percent
Permeability: Moderately slow in the upper part; moderate or moderately rapid in the lower part
Available water capacity: Low

Minor Soils

- Glynwood and Pewamo soils on ground moraines
- Millgrove soils in depressions and drainageways
- Rossburg and Sloan soils on flood plains

Use and Management

Major uses: Agriculture
Management concerns: Erosion, droughtiness, wetness, permeability

4. Glynwood-Milton-Blount Association

Very deep and moderately deep, nearly level to moderately steep soils that formed in loess, till, and residuum derived from limestone or dolostone

Setting

Landform: Ground moraines, end moraines
Slope range: 0 to 18 percent
Landscape features: Strongly sloping to moderately steep backslopes surrounding O’Shaughnessy Reservoir on the Scioto River

Composition

Percent of the survey area: 3
Extent of the soils in the association:
Glynwood soils—42 percent
Milton soils—18 percent
Blount soils—11 percent
Minor soils—29 percent

Soil Properties and Qualities

Glynwood

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits, shoulders, backslopes
Parent material: Till
Surface textural class: Silt loam, silty clay loam
Slope range: 2 to 12 percent
Permeability: Slow or very slow
Available water capacity: Low

Milton

Depth class: Moderately deep
Drainage class: Well drained
Position on the landform: Summits, shoulders, backslopes
Parent material: Loess, till, and residuum derived from limestone or dolostone
Surface textural class: Silt loam
Slope range: 2 to 18 percent
Permeability: Moderate or moderately slow
Available water capacity: Low

Blount

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Slight rises, flat areas, knolls, areas of swell-and-swale topography, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 0 to 4 percent
Permeability: Slow or very slow
Available water capacity: Moderate

Minor Soils

- Scioto soils on outwash terraces
- Lybrand soils on the steeper slopes

Use and Management

Major uses: Urban and recreational development
Management concerns: Steep slopes, depth to bedrock, permeability, erosion

5. Bennington-Cardington-Pewamo Association

Very deep, level to strongly sloping soils that formed in till

Setting

Landform: Ground moraines
Slope range: 0 to 12 percent

Landscape features: Low rises, a few depressions, and a few knolls

Composition

Percent of the survey area: 15
Extent of the soils in the association (fig. 5):
Bennington soils—40 percent
Cardington soils—22 percent
Pewamo soils—12 percent
Minor soils—26 percent

Soil Properties and Qualities

Bennington

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Slight rises, flat areas, knolls, areas of swell-and-swale topography, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 0 to 4 percent
Permeability: Slow
Available water capacity: Moderate

Cardington

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits, shoulders, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 2 to 12 percent
Permeability: Slow
Available water capacity: Moderate

Pewamo

Depth class: Very deep
Drainage class: Very poorly drained
Position on the landform: Depressions, flat areas, drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope range: 0 to 1 percent
Permeability: Moderately slow
Available water capacity: High

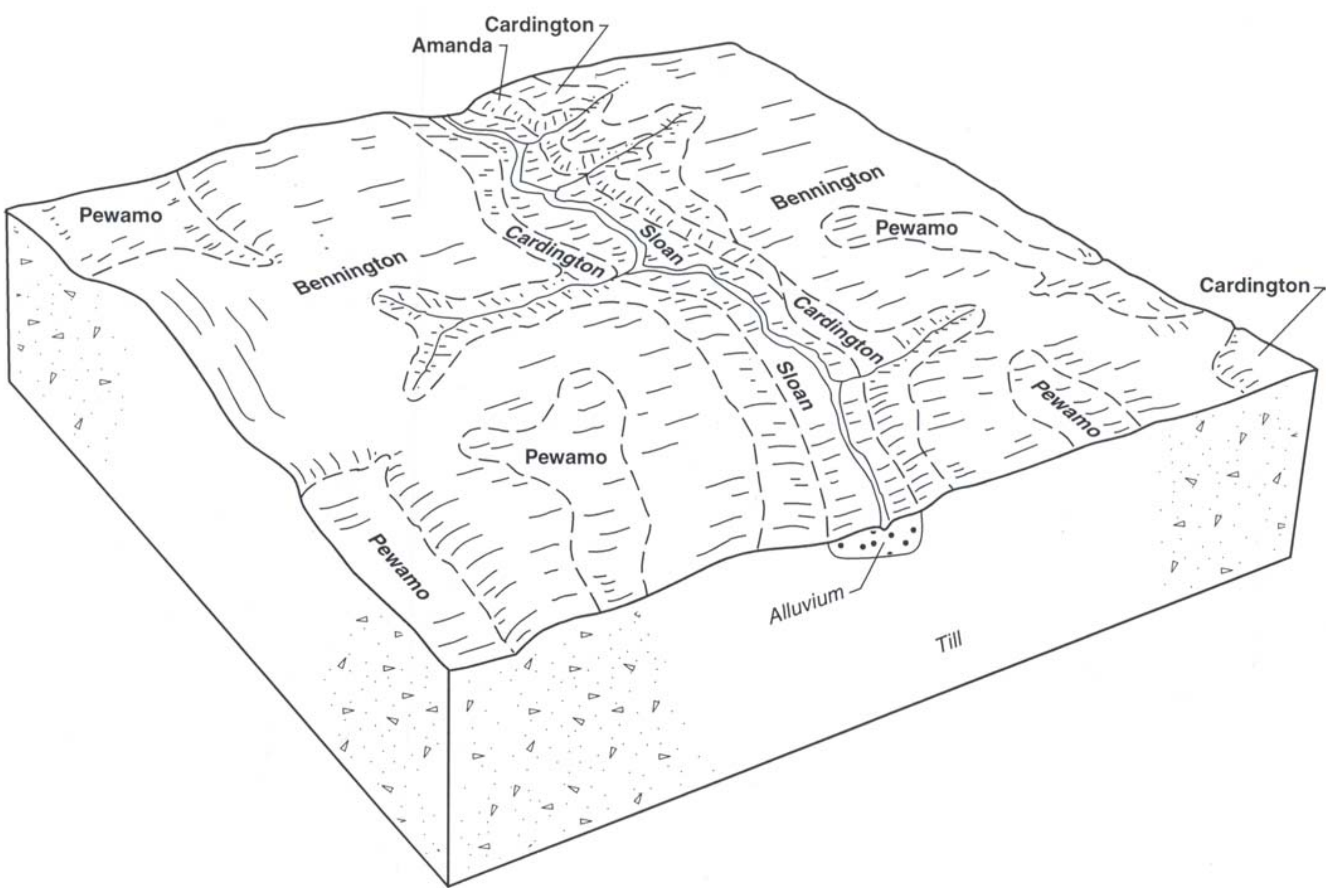

Figure 5.—Typical pattern of soils and parent material in the Bennington-Cardington-Pewamo association.

Minor Soils

- Amanda soils on backslopes and shoulders near flood plains
- Gallman soils on outwash terraces
- Sloan soils on flood plains

Use and Management

Major uses: Agriculture, urban development
Management concerns: Wetness, erosion, permeability

6. Cardington-Bennington-Pewamo Association

Very deep, level to strongly sloping soils that formed in till

Setting

Landform: End moraines
Slope range: 0 to 12 percent
Landscape features: Low rises, a few depressions, and a few knolls

Composition

Percent of the survey area: 7
Extent of the soils in the association:
Cardington soils—43 percent
Bennington soils—22 percent
Pewamo soils—11 percent
Minor soils—24 percent

Soil Properties and Qualities

Cardington

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits, shoulders, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 2 to 12 percent
Permeability: Slow
Available water capacity: Moderate

Bennington

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Slight rises, flat areas, knolls, areas of swell-and-swale topography, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 0 to 4 percent
Permeability: Slow
Available water capacity: Moderate

Pewamo

Depth class: Very deep
Drainage class: Very poorly drained
Position on the landform: Depressions, flat areas, drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope range: 0 to 1 percent
Permeability: Moderately slow
Available water capacity: High

Minor Soils

- Amanda soils on backslopes and shoulders near flood plains
- Gallman soils on outwash terraces
- Lobdell, Rossburg, and Sloan soils on flood plains

Use and Management

Major uses: Agriculture, urban development
Management concerns: Permeability, erosion, wetness

7. Bennington-Centerburg-Pewamo Association

Very deep, level to strongly sloping soils that formed in till

Setting

Landform: End moraines, ground moraines
Slope range: 0 to 12 percent
Landscape features: Low rises, a few depressions, and a few knolls

Composition

Percent of the survey area: 3
Extent of the soils in the association:
Bennington soils—35 percent
Centerburg soils—33 percent
Pewamo soils—17 percent
Minor soils—15 percent

Soil Properties and Qualities

Bennington

Depth class: Very deep
Drainage class: Somewhat poorly drained

Position on the landform: Slight rises, flat areas, knolls, areas of swell-and-swale topography, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 0 to 4 percent
Permeability: Slow
Available water capacity: Moderate

Centerburg

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits, shoulders, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 2 to 12 percent
Permeability: Moderately slow
Available water capacity: Moderate

Pewamo

Depth class: Very deep
Drainage class: Very poorly drained
Position on the landform: Depressions, flat areas, drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope range: 0 to 1 percent
Permeability: Moderately slow
Available water capacity: High

Minor Soils

- Amanda soils on backslopes and shoulders near flood plains
- Gallman soils on outwash terraces
- Lobdell and Sloan soils on flood plains

Use and Management

Major uses: Agriculture, urban development
Management concerns: Wetness, erosion, permeability

8. Bennington-Pewamo-Centerburg Association

Very deep, level to strongly sloping soils that formed in till

Setting

Landform: Ground moraines, end moraines
Slope range: 0 to 12 percent
Landscape features: Low rises, a few depressions, and a few knolls

Composition

Percent of the survey area: 13
Extent of the soils in the association:
Bennington soils—43 percent
Pewamo soils—27 percent
Centerburg soils—15 percent
Minor soils—15 percent

Soil Properties and Qualities

Bennington

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Slight rises, flat areas, knolls, areas of swell-and-swale topography, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 0 to 4 percent
Permeability: Slow
Available water capacity: Moderate

Pewamo

Depth class: Very deep
Drainage class: Very poorly drained
Position on the landform: Depressions, flat areas, drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope range: 0 to 1 percent
Permeability: Moderately slow
Available water capacity: High

Centerburg

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits, shoulders, backslopes
Parent material: Till
Surface textural class: Silt loam
Slope range: 2 to 12 percent
Permeability: Moderately slow
Available water capacity: Moderate

Minor Soils

- Lobdell and Sloan soils on flood plains
- Amanda soils on backslopes and shoulders near flood plains

- Gallman soils on outwash terraces
- Hyatts and Smothers soils in areas that are moderately deep or deep to bedrock; in the southern part of the county

Use and Management

Major uses: Agriculture
Management concerns: Wetness, erosion, permeability

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the county. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given in the tables.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called similar, or noncontrasting, soils. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called dissimilar, or contrasting, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of soil mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Glynwood silt loam, 2 to 6 percent slopes, is a phase of the Glynwood series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are called complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Latham-Brecksville complex, 25 to 70 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Figure 6 shows the relationship between different geomorphic slope positions and slope terminology. In Delaware County, these terms are applied only in areas that have slopes of more than 2 percent. More detailed definitions of these landform components are in the Glossary.

AmD2—Amanda silt loam, 12 to 18 percent slopes, eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Backslopes, shoulders
Size of areas: 2 to 20 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 6 inches—brown, friable silt loam

Subsurface layer:
6 to 9 inches—yellowish brown, friable silt loam

Subsoil:
9 to 22 inches—yellowish brown, firm silty clay loam
22 to 42 inches—yellowish brown and dark yellowish brown, mottled, firm silty clay loam

Substratum:
42 to 80 inches—brown, mottled, firm silt loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 40 to 70 inches
Drainage class: Well drained
Kind of water table: Perched
Depth to the water table: 3.5 to 6.0 feet
Permeability: Moderately slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 9.5 inches
Cation-exchange capacity: 10 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Moderately well drained soils
- Soils that have lenses of very fine sand and silt in the substratum

Composition

Amanda and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Bennington soils in drainageways

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

AmE—Amanda silt loam, 18 to 25 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Backslopes
Size of areas: 2 to 30 acres
Special features: Moderately steep slopes

Typical Profile

Surface layer:
0 to 3 inches—dark brown, friable silt loam

Subsurface layer:
3 to 9 inches—yellowish brown, friable silt loam

Subsoil:
9 to 23 inches—yellowish brown, firm silty clay loam
23 to 43 inches—yellowish brown and dark yellowish brown, mottled, firm silty clay loam

Substratum:
43 to 80 inches—dark yellowish brown, firm silt loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 40 to 70 inches
Drainage class: Well drained
Kind of water table: Perched

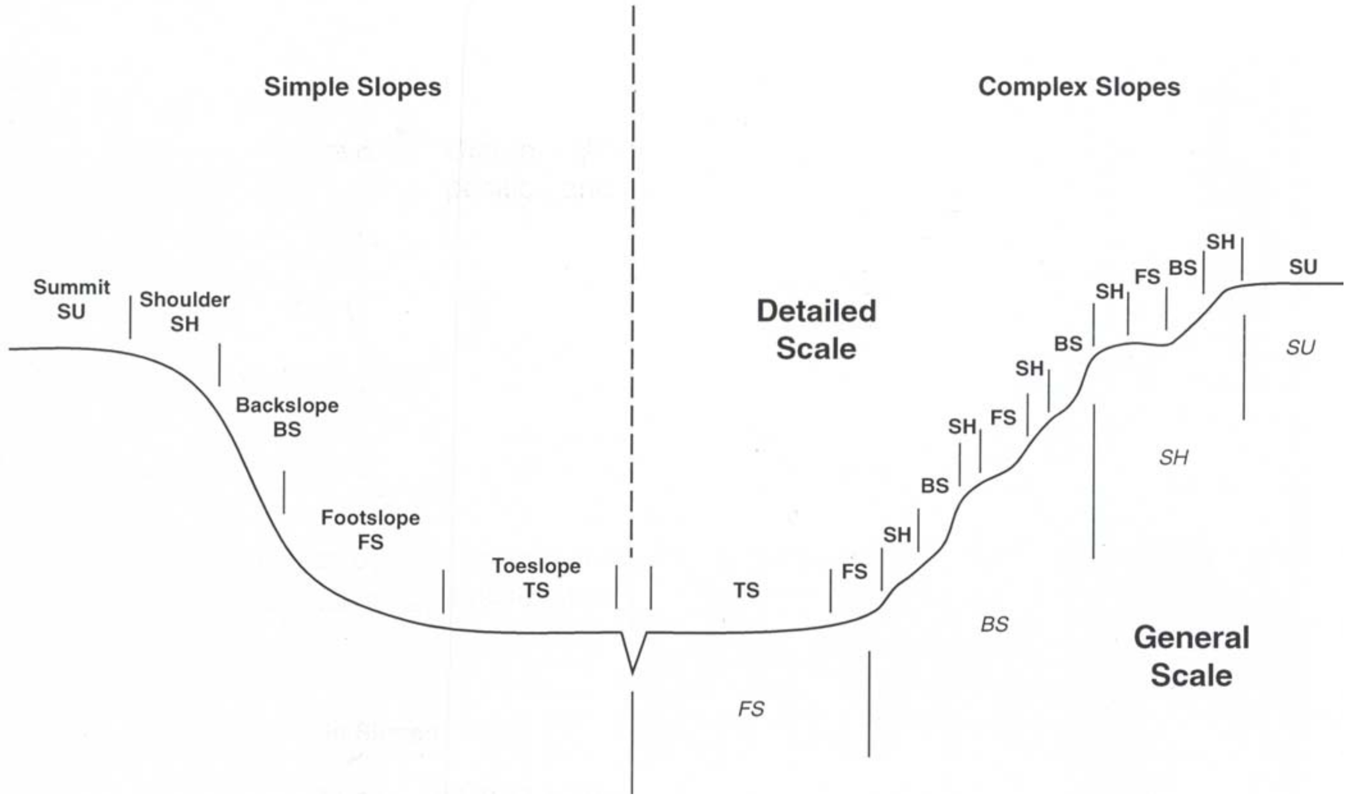

Figure 6.—Diagram showing the relationship between slope position and slope terminology.

Depth to the water table: 3.5 to 6.0 feet
Permeability: Moderately slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 9.5 inches
Cation-exchange capacity: 10 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Moderately well drained soils
- Soils that have lenses of very fine sand and silt in the substratum

Composition

Amanda and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Bennington soils near the base of slopes

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

AmF—Amanda silt loam, 25 to 50 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Backslopes
Size of areas: 2 to 50 acres
Special features: Steep slopes

Typical Profile

Surface layer:
0 to 8 inches—dark brown and brown, friable silt loam

Subsoil:
8 to 26 inches—yellowish brown, friable silt loam and firm silty clay loam
26 to 32 inches—dark yellowish brown, mottled, firm silty clay loam

32 to 48 inches—dark yellowish brown and yellowish brown, mottled, firm silty clay loam

Substratum:
48 to 80 inches—dark yellowish brown, firm loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Kind of water table: Perched
Depth to the water table: 3.5 to 6.0 feet
Permeability: Moderately slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 9.9 inches
Cation-exchange capacity: 10 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Moderately well drained soils
- Soils that have lenses of very fine sand and silt in the substratum

Composition

Amanda and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Brecksville soils on the steeper parts of slopes
- Bennington soils near the base of slopes

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

BeA—Bennington silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Slight rises, flat areas (fig. 7)
Size of areas: 2 to 200 acres

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsoil:
8 to 10 inches—yellowish brown, mottled, firm silt loam
10 to 29 inches—light brownish gray and yellowish brown, mottled, firm silty clay loam
29 to 54 inches—dark yellowish brown, mottled, firm silty clay loam

Substratum:
54 to 80 inches—brown, mottled, firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 28 to 70 inches
Drainage class: Somewhat poorly drained
Kind of water table: Perched
Depth to the water table: 0.5 to 1.0 foot
Permeability: Slow
Dominant parent material: Till
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 8.4 inches
Cation-exchange capacity: 12 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have lenses of very fine sand and silt in the substratum
- Moderately well drained soils

Composition

Bennington and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Condit soils in swales
- Pewamo soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section

Figure 7.—Soybeans in an area of Bennington silt loam, 0 to 2 percent slopes. The buildings in the background are on Centerburg silt loam, 6 to 12 percent slopes, eroded.

- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

BeB—Bennington silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Areas of swell-and-swale topography, knolls, slight rises, backslopes
Size of areas: 2 to 50 acres

Typical Profile

Surface layer:
0 to 9 inches—dark grayish brown, friable silt loam

Subsoil:
9 to 20 inches—yellowish brown, mottled, firm silty clay loam
20 to 55 inches—dark yellowish brown, mottled, firm silty clay loam

Substratum:
55 to 80 inches—dark yellowish brown, firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 28 to 70 inches
Drainage class: Somewhat poorly drained
Kind of water table: Perched
Depth to the water table: 0.5 to 1.0 foot
Permeability: Slow
Dominant parent material: Till
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 8.4 inches
Cation-exchange capacity: 12 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have lenses of very fine sand and silt in the substratum

- Soils that have an eroded surface layer
- Moderately well drained soils

Composition

Bennington and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Condit soils in swales
- Pewamo soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

BoA—Blount silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Slight rises, flat areas
Size of areas: 2 to 50 acres

Typical Profile

Surface layer:
0 to 9 inches—brown, friable silt loam

Subsoil:
9 to 27 inches—yellowish brown and dark yellowish brown, mottled, firm silty clay loam
27 to 38 inches—brown, mottled, firm clay loam

Substratum:
38 to 80 inches—brown, mottled, very firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 20 to 45 inches
Drainage class: Somewhat poorly drained
Kind of water table: Perched
Depth to the water table: 0.5 to 1.0 foot
Permeability: Slow or very slow
Dominant parent material: Till
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 7.1 inches
Cation-exchange capacity: 17 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
- Moderately well drained soils

Composition

Blount and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Pewamo soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

BoB—Blount silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Areas of swell-and-swale topography, knolls, slight rises, backslopes
Size of areas: 2 to 30 acres

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsoil:
8 to 32 inches—yellowish brown, mottled, firm silty clay loam
32 to 42 inches—dark yellowish brown, mottled, firm silty clay loam

Substratum:
42 to 80 inches—brown, mottled, very firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 20 to 45 inches
Drainage class: Somewhat poorly drained
Kind of water table: Perched

Depth to the water table: 0.5 to 1.0 foot
Permeability: Slow or very slow
Dominant parent material: Till
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 7.6 inches
Cation-exchange capacity: 17 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have an eroded surface layer
- Soils that have a substratum within a depth of 20 inches
- Moderately well drained soils

Composition

Blount and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Pewamo soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

CaB—Cardington silt loam, 2 to 6 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Summits, shoulders, backslopes
Size of areas: 2 to 100 acres

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsoil:
8 to 12 inches—yellowish brown, firm silty clay loam and dark grayish brown silt loam
12 to 38 inches—yellowish brown, dark yellowish brown, and brown, mottled, firm silty clay loam and clay loam

Substratum:
38 to 60 inches—brown, firm clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 28 to 50 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 7.8 inches
Cation-exchange capacity: 12 to 18 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have an eroded surface layer
- Somewhat poorly drained soils

Composition

Cardington and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Pewamo soils in drainageways

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

CaC2—Cardington silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Summits, shoulders, backslopes
Size of areas: 2 to 50 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 9 inches—brown, friable silt loam

Subsoil:
9 to 14 inches—yellowish brown, friable silty clay loam
14 to 43 inches—dark yellowish brown and brown, mottled, firm silty clay loam

Substratum:
43 to 80 inches—brown, firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 28 to 50 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 8.1 inches
Cation-exchange capacity: 12 to 18 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that contain more clay in the surface layer
- Well drained soils
- Somewhat poorly drained soils

Composition

Cardington and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

CeB—Centerburg silt loam, 2 to 6 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Summits, shoulders, backslopes
Size of areas: 2 to 100 acres

Typical Profile

Surface layer:
0 to 6 inches—brown, friable silt loam

Subsoil:
6 to 12 inches—dark yellowish brown, mottled, firm silty clay loam
12 to 38 inches—yellowish brown, mottled, firm clay loam
38 to 50 inches—dark yellowish brown, firm loam

Substratum:
50 to 80 inches—brown, firm loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 30 to 54 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Moderately slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 9.7 inches
Cation-exchange capacity: 6 to 18 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have an eroded surface layer
- Soils that have lenses of very fine sand and silt in the substratum
- Somewhat poorly drained soils

Composition

Centerburg and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Pewamo soils in drainageways

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

CeC2—Centerburg silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Summits, shoulders, backslopes
Size of areas: 2 to 50 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown, friable silt loam

Subsoil:
7 to 31 inches—yellowish brown and dark yellowish brown, mottled, firm clay loam

Substratum:
31 to 80 inches—brown, firm loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 30 to 54 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Moderately slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 8.0 inches
Cation-exchange capacity: 6 to 18 milliequivalents per 100 grams in the surface layer
Similar soils:
- Well drained soils
- Soils that have more clay in the surface layer
- Soils that have lenses of very fine sand and silt in the substratum
- Somewhat poorly drained soils

Composition

Centerburg and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

CnA—Condit silt loam, 0 to 1 percent slopes

Setting

Landform: Ground moraines
Position on the landform: Closed depressions
Size of areas: 2 to 20 acres
Special features: Subject to ponding

Typical Profile

Surface layer:
0 to 10 inches—dark grayish brown, friable silt loam

Subsoil:
10 to 32 inches—grayish brown, mottled, firm silty clay loam
32 to 70 inches—dark yellowish brown and brown, mottled, firm silty clay loam

Substratum:
70 to 80 inches—brown, mottled, firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 38 to 75 inches
Drainage class: Very poorly drained
Kind of water table: Perched
Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Long
Permeability: Slow
Dominant parent material: Till
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 8.1 inches
Cation-exchange capacity: 14 to 26 milliequivalents per 100 grams in the surface layer
Special features: Hydric soil
Similar soils:
- Soils that have less clay in the subsoil
- Soils that have a darker surface layer
- Soils that have more clay in the surface layer

Composition

Condit and similar soils: 90 percent

Dissimilar components: 10 percent

Dissimilar Components

• Bennington soils on slight rises and near the edges of the mapped areas

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

EdA—Edwards muck, 0 to 1 percent slopes

Setting

Landform: Outwash plains
Position on the landform: Depressions
Size of areas: 2 to 20 acres
Special features: Subject to ponding

Typical Profile

Surface layer:
0 to 10 inches—black, friable muck

Subsurface layer:
10 to 19 inches—black, friable muck

Substratum:
19 to 80 inches—light gray, mottled, very friable marl

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Very poorly drained
Kind of water table: Apparent
Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Very long
Permeability: Moderately slow to moderately rapid in the organic material; moderately slow or slow in the marl
Dominant parent material: Organic deposits overlying marl
Organic matter content in the surface layer: 55.0 to 75.0 percent
Potential for frost action: High
Available water capacity: About 7.6 inches
Cation-exchange capacity: 150 to 230 milliequivalents per 100 grams in the surface layer
Special features: The organic surface layer is subject to oxidation, subsidence, and wind erosion. Also, this soil is a hydric soil.
Similar soils:
• Soils in which the organic deposit is less than 16 inches thick

Composition

Edwards and similar soils: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

• Pewamo soils at the edges of the mapped areas
• Stone soils on slight rises and near the edges of the mapped areas

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

GaC2—Gallman loam, loamy substratum, 6 to 12 percent slopes, eroded

Setting

Landform: Kames, outwash terraces
Position on the landform: Shoulders, summits, backslopes
Size of areas: 2 to 10 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown, friable loam

Subsoil:
7 to 25 inches—brown, firm gravelly loam and gravelly clay loam
25 to 35 inches—dark yellowish brown, firm very gravelly loam
35 to 50 inches—brown, friable very gravelly loam

Substratum:
50 to 80 inches—brown, very friable very gravelly sandy loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderately rapid
Dominant parent material: Outwash
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 7.9 inches
Cation-exchange capacity: 8 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have a substratum within a depth of 20 inches
- Soils that have a water table in the lower part and formed in till

Composition

Gallman and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

GbA—Gallman silt loam, loamy substratum, 0 to 2 percent slopes

Setting

Landform: Outwash terraces, end moraines
Position on the landform: Flat areas, summits
Size of areas: 2 to 40 acres

Typical Profile

Surface layer:
0 to 10 inches—brown, friable silt loam

Subsoil:
10 to 35 inches—dark yellowish brown, friable clay loam and sandy clay loam
35 to 56 inches—brown, friable gravelly clay loam

Substratum:
56 to 80 inches—brown, friable gravelly loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderately rapid
Dominant parent material: Outwash
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 8.1 inches
Cation-exchange capacity: 8 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have a water table in the lower part
- Soils that have a channery or very channery substratum
- Soils that have shale bedrock at a depth of 60 to 80 inches

Composition

Gallman and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Millgrove soils in depressions
- Heverlo soils in the lower positions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

GbB—Gallman silt loam, loamy substratum, 2 to 6 percent slopes

Setting

Landform: Outwash terraces, end moraines
Position on the landform: Backslopes, knolls
Size of areas: 2 to 40 acres

Typical Profile

Surface layer:
0 to 9 inches—brown, firm silt loam

Subsurface layer:
9 to 16 inches—dark yellowish brown, firm loam

Subsoil:
16 to 50 inches—brown, firm gravelly clay loam and very gravelly clay loam
50 to 73 inches—brown, friable sandy clay loam

Substratum:
73 to 80 inches—dark grayish brown and light yellowish brown, loose loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderately rapid
Dominant parent material: Outwash
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 8.2 inches
Cation-exchange capacity: 8 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have an eroded surface layer
- Soils that have a channery or very channery substratum
- Soils that have shale bedrock at a depth of 60 to 80 inches

Composition

Gallman and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Millgrove soils in depressions
- Heverlo soils in the lower positions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

GcB—Gallman silt loam, till substratum, 2 to 6 percent slopes

Setting

Landform: Outwash terraces, end moraines
Position on the landform: Backslopes, knolls
Size of areas: 2 to 40 acres

Typical Profile

Surface layer:
0 to 12 inches—brown, friable silt loam

Subsoil:
12 to 45 inches—brown, friable gravelly clay loam and clay loam
45 to 60 inches—dark brown, friable clay loam with pockets of stratified sandy clay loam, sandy loam, and coarse sandy loam

Substratum:
60 to 65 inches—yellowish brown, very friable very gravelly sandy loam
65 to 80 inches—brown, firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderately rapid
Dominant parent material: Outwash overlying till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 8.3 inches
Cation-exchange capacity: 15 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have more sand and less clay in the substratum
- Soils that have a darker surface layer

Composition

Gallman and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

GwB—Glynwood silt loam, 2 to 6 percent slopes

Setting

Landform: Ground moraines, end moraines (fig. 8)

Figure 8.—Pasture in an area of Glynwood silt loam, 2 to 6 percent slopes.

Position on the landform: Summits, shoulders, backslopes
Size of areas: 2 to 200 acres

Typical Profile

Surface layer:
0 to 8 inches—brown, friable silt loam

Subsoil:
8 to 12 inches—yellowish brown, firm silty clay loam
12 to 25 inches—yellowish brown, mottled, firm silty clay loam
25 to 33 inches—dark yellowish brown, mottled, firm silty clay loam

Substratum:
33 to 80 inches—yellowish brown, very firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 25 to 40 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Slow or very slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 5.9 inches
Cation-exchange capacity: 12 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have an eroded surface layer
- Soils that have more clay in the surface layer
- Well drained soils
- Somewhat poorly drained soils

Composition

Glynwood and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Pewamo soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section

- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

GwC2—Glynwood silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Shoulders, backslopes, summits
Size of areas: 2 to 50 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 7 inches—brown and yellowish brown, friable silt loam

Subsoil:
7 to 15 inches—yellowish brown, firm silty clay loam
15 to 22 inches—yellowish brown, mottled, firm silty clay loam
22 to 36 inches—dark yellowish brown, mottled, firm silty clay loam

Substratum:
36 to 80 inches—brown, very firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 25 to 40 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Slow or very slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 6.0 inches
Cation-exchange capacity: 12 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have more clay in the surface layer
- Somewhat poorly drained soils

Composition

Glynwood and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Pewamo soils in drainageways

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

GzC3—Glynwood silty clay loam, 6 to 12 percent slopes, severely eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Shoulders, backslopes
Size of areas: 2 to 10 acres
Special features: Most of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown, friable silty clay loam

Subsoil:
7 to 10 inches—yellowish brown, firm silty clay
10 to 18 inches—yellowish brown, mottled, firm silty clay
18 to 36 inches—yellowish brown, mottled, firm silty clay loam

Substratum:
36 to 80 inches—brown, very firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 25 to 40 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Slow or very slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 2.0 percent
Potential for frost action: High

Available water capacity: About 5.7 inches
Cation-exchange capacity: 12 to 20 milliequivalents per 100 grams in the surface layer
Special features: High clay content in the surface layer
Similar soils:
- Well drained soils

Composition

Glynwood and similar soils: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

- Pewamo soils in drainageways
- Blount soils in the less sloping areas

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

HeF—Heverlo silt loam, 25 to 70 percent slopes

Setting

Landform: Valley sides on till plains
Position on the landform: Backslopes, shoulders
Size of areas: 2 to 10 acres
Special features: Very steep slopes

Typical Profile

Surface layer:
0 to 5 inches—dark brown, friable silt loam

Subsurface layer:
5 to 10 inches—dark grayish brown and yellowish brown, friable silt loam

Subsoil:
10 to 27 inches—yellowish brown, firm silty clay loam

Bedrock:
27 to 37 inches—black, soft shale

Soil Properties and Qualities

Depth class: Moderately deep (20 to 40 inches)
Root zone: Shale bedrock at a depth of 20 to 40 inches
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate
Dominant parent material: Outwash overlying shale
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 4.7 inches
Cation-exchange capacity: 5 to 10 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have less clay in the subsoil
- Moderately well drained soils

Composition

Heverlo and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Gallman soils on shoulders

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

HyA—Hyatts silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines
Position on the landform: Flat areas
Size of areas: 5 to 20 acres

Typical Profile

Surface layer:
0 to 11 inches—grayish brown, friable silt loam

Subsoil:
11 to 16 inches—yellowish brown, mottled, firm silty clay loam
16 to 35 inches—strong brown and dark yellowish brown, mottled, firm silty clay and silty clay loam
35 to 46 inches—variegated yellowish brown, grayish brown, and yellowish red, firm silty clay

Bedrock:
46 to 56 inches—yellowish brown and grayish brown, soft shale

Soil Properties and Qualities

Depth class: Deep (40 to 60 inches)
Root zone: Shale bedrock at a depth of 40 to 60 inches
Drainage class: Somewhat poorly drained
Kind of water table: Perched
Depth to the water table: 0.5 to 1.0 foot
Permeability: Slow
Dominant parent material: Till and the underlying residuum derived from shale
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 6.8 inches
Cation-exchange capacity: 15 to 19 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have shale bedrock at a depth of 20 to 40 inches
- Moderately well drained soils

Composition

Hyatts and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

HyB—Hyatts silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines
Position on the landform: Areas of swell-and-swale topography, knolls, backslopes
Size of areas: 5 to 30 acres

Typical Profile

Surface layer:
0 to 9 inches—brown, friable silt loam

Subsoil:
9 to 50 inches—yellowish brown and dark yellowish brown, mottled, firm silty clay loam and silty clay
50 to 58 inches—variegated gray and yellowish brown, firm silty clay loam

Bedrock:
58 to 68 inches—variegated grayish brown and yellowish brown, soft shale

Soil Properties and Qualities

Depth class: Deep (40 to 60 inches)
Root zone: Shale bedrock at a depth of 40 to 60 inches
Drainage class: Somewhat poorly drained
Kind of water table: Perched
Depth to the water table: 0.5 to 1.0 foot
Permeability: Slow
Dominant parent material: Till and the underlying residuum derived from shale
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 8.3 inches
Cation-exchange capacity: 15 to 19 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have an eroded surface layer
- Soils that have shale bedrock at a depth of 20 to 40 inches
- Moderately well drained soils

Composition

Hyatts and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

JmA—Jimtown silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash terraces
Position on the landform: Flat areas
Size of areas: 2 to 50 acres

Typical Profile

Surface layer:
0 to 10 inches—dark grayish brown, friable and firm silt loam

Subsurface layer:
10 to 15 inches—brown, mottled, friable silt loam

Subsoil:
15 to 25 inches—grayish brown, mottled, firm silt loam
25 to 40 inches—dark yellowish brown, mottled, firm clay loam and friable sandy loam
40 to 47 inches—yellowish brown and gray, mottled, friable silty clay loam and clay loam

Substratum:
47 to 64 inches—dark grayish brown, friable sandy loam and very friable gravelly sandy loam
64 to 80 inches—very dark grayish brown and very dark gray, very friable gravelly clay loam and gravelly loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Somewhat poorly drained
Kind of water table: Apparent
Depth to the water table: 0.5 to 1.0 foot
Permeability: Moderate
Dominant parent material: Outwash
Organic matter content in the surface layer: 2.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 8.1 inches
Cation-exchange capacity: 10 to 18 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have more clay and less sand in the subsoil
- Soils that have more clay and less sand in the substratum

Composition

Jimtown and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Millgrove soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

LbF—Latham-Brecksville complex, 25 to 70 percent slopes

Setting

Landform: Latham—dissected areas on till plains; Brecksville—valley sides of dissected till plains
Position on the landform: Latham—shoulders; Brecksville—backslopes
Size of areas: 2 to 100 acres
Special features: Very steep slopes

Typical Profile

Latham

Surface layer:
0 to 3 inches—dark grayish brown, friable silt loam

Subsoil:
3 to 11 inches—brown, friable silty clay loam
11 to 21 inches—brown, yellowish brown, and reddish brown, mottled, firm silty clay loam and silty clay

Substratum:
21 to 30 inches—yellowish brown, mottled, firm channery silty clay loam

Bedrock:
30 to 40 inches—black, soft shale

Brecksville

Surface layer:
0 to 3 inches—dark grayish brown, very friable silt loam

Subsoil:
3 to 18 inches—yellowish brown, friable very channery silty clay loam and channery silty clay loam

Substratum:
18 to 22 inches—yellowish brown, friable very channery silty clay loam

Bedrock:
22 to 32 inches—black, soft shale

Soil Properties and Qualities

Latham

Depth class: Moderately deep (20 to 40 inches)

Root zone: Shale bedrock at a depth of 20 to 40 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Slow
Dominant parent material: Residuum derived from shale
Organic matter content in the surface layer: 1.0 to 3.0 percent
Shrink-swell potential: High
Potential for frost action: High
Available water capacity: About 4.1 inches
Cation-exchange capacity: 6 to 17 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have sandstone bedrock at a depth of 20 to 40 inches

Brecksville

Depth class: Moderately deep (20 to 40 inches)
Root zone: Shale bedrock at a depth of 20 to 40 inches
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderately slow
Dominant parent material: Residuum derived from shale
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 3.3 inches
Cation-exchange capacity: 8 to 22 milliequivalents per 100 grams in the surface layer

Composition

Latham and similar soils: 40 percent
Brecksville and similar soils: 35 percent
Dissimilar components: 25 percent

Dissimilar Components

- Amanda soils near the base of slopes
- Cardington soils on shoulders

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

LeE—Leoni gravelly loam, 12 to 25 percent slopes

Setting

Landform: Eskers, kames
Position on the landform: Backslopes, shoulders
Size of areas: 2 to 10 acres
Special features: Moderately steep slopes

Typical Profile

Surface layer:
0 to 3 inches—very dark grayish brown, friable gravelly loam

Subsurface layer:
3 to 7 inches—dark brown, friable very gravelly loam

Subsoil:
7 to 26 inches—dark yellowish brown, friable and very friable very gravelly clay loam and very gravelly loam
26 to 37 inches—dark yellowish brown, very friable very gravelly sandy loam

Substratum:
37 to 44 inches—yellowish brown, loose very gravelly sandy loam with pockets of gravelly loamy sand
44 to 80 inches—grayish brown, loose loamy sand

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate or moderately rapid in the subsoil; moderately rapid or rapid in the substratum
Dominant parent material: Outwash
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 5.3 inches
Cation-exchange capacity: 10 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have more clay and less sand in the subsoil
- Soils that have more gravel and stones in the subsoil and substratum

Composition

Leoni and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

LoA—Lobdell silt loam, channery substratum, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains
Position on the landform: Flat areas
Size of areas: 5 to 50 acres

Typical Profile

Surface layer:
0 to 9 inches—brown, friable silt loam

Subsoil:
9 to 36 inches—dark yellowish brown and brown, mottled, friable loam

Substratum:
36 to 48 inches—brown, mottled, friable loam and clay loam
48 to 65 inches—brown, mottled, friable channery and very channery loam and clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Moderately well drained
Kind of water table: Apparent
Depth to the water table: 1 to 2 feet
Flooding duration: Brief
Permeability: Moderate
Dominant parent material: Alluvium
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 10.2 inches
Cation-exchange capacity: 8 to 17 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have more clay and less sand in the substratum
- Soils that have a darker surface layer

Composition

Lobdell and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Sloan soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

LsA—Lobdell, channery substratum-Sloan, till substratum complex, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Lobdell—natural levees on flood plains; Sloan—flood plains
Position on the landform: Lobdell—slightly higher areas adjacent to the stream channel; Sloan—backswamps, old stream channels
Size of areas: 5 to 100 acres
Special features: The Sloan soil is subject to ponding.

Typical Profile

Lobdell

Surface layer:
0 to 11 inches—dark brown, friable silt loam

Subsoil:
11 to 20 inches—brown, friable silt loam
20 to 26 inches—brown, mottled, friable silt loam

Substratum:
26 to 44 inches—grayish brown, mottled, friable loam
44 to 80 inches—dark grayish brown, mottled, friable channery loam

Sloan

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 19 inches—very dark gray, mottled, firm silty clay loam

Subsoil:
19 to 25 inches—gray, mottled, firm silty clay loam

Substratum:
25 to 54 inches—yellowish brown, mottled, firm silty clay loam
54 to 64 inches—gray, mottled, friable loam
64 to 80 inches—dark gray, firm clay loam

Soil Properties and Qualities

Lobdell

Depth class: Very deep (more than 80 inches)
Drainage class: Moderately well drained
Kind of water table: Apparent
Depth to the water table: 1 to 2 feet
Flooding duration: Brief
Permeability: Moderate
Dominant parent material: Alluvium
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 10.7 inches
Cation-exchange capacity: 8 to 17 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have more gravel in the substratum
- Better drained soils
- Well drained soils that have a darker surface layer

Sloan

Depth class: Very deep (more than 80 inches)
Drainage class: Very poorly drained
Kind of water table: Apparent
Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Brief
Permeability: Moderate or moderately slow
Dominant parent material: Alluvium overlying till
Organic matter content in the surface layer: 3.0 to 6.0 percent
Potential for frost action: High
Available water capacity: About 9.6 inches
Cation-exchange capacity: 20 to 32 milliequivalents per 100 grams in the surface layer
Special features: Hydric soil
Similar soils:
- Frequently flooded areas
- Soils that have a lighter colored surface layer

Composition

Lobdell and similar soils: 60 percent
Sloan and similar soils: 35 percent
Dissimilar components: 5 percent

Dissimilar Components

- Jimtown soils in the higher positions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

LvB—Loudonville silt loam, 2 to 6 percent slopes

Setting

Landform: Ground moraines
Position on the landform: Summits
Size of areas: 5 to 40 acres

Typical Profile

Surface layer:
0 to 12 inches—brown, friable silt loam

Subsoil:
12 to 19 inches—yellowish brown, firm silt loam
19 to 33 inches—yellowish brown, mottled, firm silty clay loam

Bedrock:
33 to 34 inches—grayish brown, hard, fine grained sandstone

Soil Properties and Qualities

Depth class: Moderately deep (20 to 40 inches)
Root zone: Sandstone bedrock at a depth of 20 to 40 inches
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate
Dominant parent material: Till overlying sandstone
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 5.5 inches
Cation-exchange capacity: 8 to 18 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have a water table in the lower part
- Soils that have sandstone bedrock at a depth of 40 to 60 inches

Composition

Loudonville and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Smothers soils in the flatter positions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

LyD2—Lybrand silt loam, 12 to 18 percent slopes, eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Backslopes and shoulders, dissected areas along streams (fig. 9)
Size of areas: 5 to 50 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 9 inches—dark grayish brown, friable silt loam

Subsoil:
9 to 33 inches—yellowish brown, firm silty clay loam and silty clay
33 to 45 inches—yellowish brown, mottled, firm silty clay loam

Substratum:
45 to 80 inches—brown, mottled, very firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 30 to 50 inches
Drainage class: Well drained
Kind of water table: Perched

Figure 9.—Pasture in an area of Lybrand silt loam, 12 to 18 percent slopes, eroded.

Depth to the water table: 3.5 to 6.0 feet
Permeability: Slow or very slow
Dominant parent material: Till
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 6.8 inches
Cation-exchange capacity: 18 to 23 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have more clay in the surface layer
- Moderately well drained soils

Composition

Lybrand and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Milton soils in drainageways

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

LyE2—Lybrand silt loam, 18 to 25 percent slopes, eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Backslopes, dissected areas along streams
Size of areas: 5 to 50 acres
Special features: Moderately steep slopes

Typical Profile

Surface layer:
0 to 7 inches—brown, friable silt loam

Subsoil:
7 to 25 inches—yellowish brown, firm silty clay loam
25 to 37 inches—yellowish brown, mottled, firm silty clay loam

Substratum:
37 to 80 inches—dark yellowish brown, mottled, very firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 30 to 50 inches
Drainage class: Well drained
Kind of water table: Perched
Depth to the water table: 3.5 to 6.0 feet
Permeability: Slow or very slow
Dominant parent material: Till
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 5.8 inches
Cation-exchange capacity: 18 to 23 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have an uneroded surface layer
- Moderately well drained soils

Composition

Lybrand and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

LzD3—Lybrand silty clay loam, 12 to 18 percent slopes, severely eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Shoulders, backslopes, dissected areas along streams
Size of areas: 5 to 20 acres
Special features: Most of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 2 inches—brown, friable silty clay loam

Subsoil:
2 to 32 inches—dark yellowish brown and yellowish brown, firm and very firm silty clay loam

Substratum:
32 to 80 inches—yellowish brown, mottled, very firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 30 to 50 inches
Drainage class: Well drained
Kind of water table: Perched
Depth to the water table: 3.5 to 6.0 feet
Permeability: Slow or very slow
Dominant parent material: Till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 4.9 inches
Cation-exchange capacity: 18 to 25 milliequivalents per 100 grams in the surface layer
Special features: High clay content in the surface layer
Similar soils:
- Soils having a surface layer that is less severely eroded
- Moderately well drained soils

Composition

Lybrand and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

MaB—Martinsville loam, 2 to 6 percent slopes

Setting

Landform: Outwash terraces
Position on the landform: Summits, shoulders, backslopes
Size of areas: 2 to 10 acres

Typical Profile

Surface layer:
0 to 7 inches—brown, friable loam

Subsoil:
7 to 40 inches—brown, firm clay loam
40 to 80 inches—brown, friable clay loam and sandy clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate
Dominant parent material: Outwash
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 10.0 inches
Cation-exchange capacity: 5 to 16 milliequivalents per 100 grams in the surface layer
Similar soils:
- Moderately well drained soils that formed in till

Composition

Martinsville and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

MbB—Martinsville loam, till substratum, 2 to 6 percent slopes

Setting

Landform: Outwash terraces, ground moraines
Position on the landform: Summits, shoulders, backslopes
Size of areas: 5 to 50 acres

Typical Profile

Surface layer:
0 to 11 inches—brown, friable loam

Subsoil:
11 to 26 inches—dark yellowish brown, friable loam and clay loam
26 to 35 inches—yellowish brown, firm clay loam
35 to 49 inches—dark yellowish brown and brown, friable sandy clay loam
49 to 55 inches—dark grayish brown, friable sandy loam

Substratum:
55 to 65 inches—dark yellowish brown, loose, stratified loamy sand and very fine sandy loam
65 to 80 inches—yellowish brown, firm loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate
Dominant parent material: Outwash overlying till
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 10.6 inches
Cation-exchange capacity: 6 to 18 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have more sand and less clay in the substratum
- Moderately well drained soils that formed in till

Composition

Martinsville and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

McD2—Mentor silt loam, 12 to 18 percent slopes, eroded

Setting

Landform: Kames
Position on the landform: Backslopes, shoulders, summits
Size of areas: 2 to 20 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 3 inches—brown, friable silt loam
3 to 7 inches—dark yellowish brown, friable silt loam

Subsoil:
7 to 24 inches—dark yellowish brown, friable silty clay loam
24 to 62 inches—dark yellowish brown, mottled, friable silt loam
62 to 70 inches—yellowish brown and grayish brown, mottled, friable, stratified silt loam and silt

Substratum:
70 to 80 inches—yellowish brown and grayish brown, mottled, friable, stratified silt and very fine sandy loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Kind of water table: Apparent
Depth to the water table: 3.5 to 6.0 feet
Permeability: Moderate
Dominant parent material: Glaciofluvial deposits
Organic matter content in the surface layer: 1.0 to 3.0 percent
Potential for frost action: High
Available water capacity: About 11.6 inches
Cation-exchange capacity: 8 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Moderately well drained soils that formed in till

Composition

Mentor and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

MfA—Millgrove silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash terraces, outwash plains
Position on the landform: Flat areas, depressions, drainageways

Size of areas: 2 to 100 acres
Special features: Subject to ponding

Typical Profile

Surface layer:
0 to 10 inches—very dark grayish brown, firm silt loam

Subsurface layer:
10 to 12 inches—very dark gray, mottled, firm silt loam

Subsoil:
12 to 20 inches—dark gray, mottled, firm silty clay loam
20 to 38 inches—gray, mottled, friable clay loam
38 to 50 inches—grayish brown, friable gravelly loam

Substratum:
50 to 80 inches—grayish brown, friable extremely gravelly loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Very poorly drained
Kind of water table: Apparent
Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Brief
Permeability: Moderate
Dominant parent material: Outwash
Organic matter content in the surface layer: 3.0 to 8.0 percent
Potential for frost action: High
Available water capacity: About 8.7 inches
Cation-exchange capacity: 15 to 30 milliequivalents per 100 grams in the surface layer
Special features: Hydric soil

Composition

Millgrove and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Jimtown soils on slight rises and near the edges of the mapped areas

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

MgA—Millgrove silty clay loam, 0 to 2 percent slopes

Setting

Landform: Outwash terraces, outwash plains
Position on the landform: Flat areas, depressions, drainageways
Size of areas: 2 to 100 acres
Special features: Subject to ponding

Typical Profile

Surface layer:
0 to 15 inches—very dark grayish brown, firm silty clay loam

Subsoil:
15 to 45 inches—gray, mottled, firm silty clay loam
45 to 55 inches—gray, mottled, friable gravelly silt loam

Substratum:
55 to 80 inches—gray, friable very gravelly loam and very gravelly silt loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Very poorly drained
Kind of water table: Apparent
Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Brief
Permeability: Moderate
Dominant parent material: Outwash
Organic matter content in the surface layer: 3.0 to 8.0 percent
Potential for frost action: High
Available water capacity: About 9.0 inches
Cation-exchange capacity: 20 to 32 milliequivalents per 100 grams in the surface layer
Special features: High clay content in the surface layer; hydric soil
Similar soils:
- Soils that have more clay in the subsoil and formed in till

Composition

Millgrove and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Stone soils on slight rises and low knolls

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

MhA—Millgrove silty clay loam, 0 to 2 percent slopes, rarely flooded

Setting

Landform: Outwash terraces
Position on the landform: Flat areas, depressions, drainageways
Size of areas: 5 to 100 acres
Special features: Subject to ponding

Typical Profile

Surface layer:
0 to 10 inches—very dark gray, firm silty clay loam

Subsoil:
10 to 27 inches—grayish brown, mottled, firm silty clay loam
27 to 34 inches—grayish brown, mottled, friable very gravelly clay loam

Substratum:
34 to 80 inches—dark grayish brown and grayish brown, loose extremely cobbly sandy loam, extremely gravelly loam, and extremely gravelly coarse sandy loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Very poorly drained
Kind of water table: Apparent
Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Brief
Permeability: Moderate
Dominant parent material: Outwash
Organic matter content in the surface layer: 3.0 to 8.0 percent
Potential for frost action: High
Available water capacity: About 6.2 inches
Cation-exchange capacity: 20 to 35 milliequivalents per 100 grams in the surface layer
Special features: High clay content in the surface layer; hydric soil

Composition

Millgrove and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Stone soils on slight rises and low knolls

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

MoB—Milton silt loam, 2 to 6 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Summits, shoulders, backslopes
Size of areas: 2 to 100 acres

Typical Profile

Surface layer:
0 to 10 inches—brown, friable silt loam

Subsoil:
10 to 15 inches—yellowish brown, friable silty clay loam
15 to 28 inches—dark yellowish brown, firm clay loam and clay
28 to 31 inches—yellowish brown, firm extremely gravelly clay loam

Bedrock:
31 to 32 inches—white, hard limestone

Soil Properties and Qualities

Depth class: Moderately deep (20 to 40 inches)
Root zone: Limestone bedrock at a depth of 20 to 40 inches
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate or moderately slow

Dominant parent material: Loess, till, and the underlying residuum derived from limestone or dolostone
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 5.2 inches
Cation-exchange capacity: 10 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have limestone bedrock at a depth of 40 to 60 inches
- Soils that have more clay in the surface layer

Composition

Milton and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Glynwood soils in the higher positions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

MoC2—Milton silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Shoulders, summits, backslopes
Size of areas: 2 to 10 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 10 inches—brown, friable silt loam

Subsoil:
10 to 26 inches—dark yellowish brown, firm silty clay loam
26 to 28 inches—dark yellowish brown, firm loam

Bedrock:
28 to 29 inches—white, hard limestone

Soil Properties and Qualities

Depth class: Moderately deep (20 to 40 inches)
Root zone: Limestone bedrock at a depth of 20 to 40 inches
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate or moderately slow
Dominant parent material: Till overlying limestone or dolostone
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 4.8 inches
Cation-exchange capacity: 10 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have limestone bedrock at a depth of 40 to 60 inches
- Soils that have a water table in the lower part

Composition

Milton and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Glynwood soils in the higher positions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

MpD2—Milton-Lybrand complex, 12 to 18 percent slopes, eroded

Setting

Landform: Ground moraines, end moraines
Position on the landform: Milton—shoulders; Lybrand—backslopes
Size of areas: 5 to 20 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Milton

Surface layer:
0 to 8 inches—brown, friable silt loam

Subsoil:
8 to 22 inches—yellowish brown, firm silty clay loam

Bedrock:
22 to 23 inches—white, hard limestone

Lybrand

Surface layer:
0 to 7 inches—brown, friable silt loam

Subsoil:
7 to 48 inches—yellowish brown, firm silty clay loam

Substratum:
48 to 80 inches—dark yellowish brown, mottled, very firm silty clay loam

Soil Properties and Qualities

Milton

Depth class: Moderately deep (20 to 40 inches)
Root zone: Limestone bedrock at a depth of 20 to 40 inches
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate or moderately slow
Dominant parent material: Till overlying limestone or dolostone
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 3.7 inches
Cation-exchange capacity: 10 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have limestone bedrock at a depth of 40 to 60 inches

Lybrand

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 30 to 50 inches
Drainage class: Well drained
Kind of water table: Perched
Depth to the water table: 3.5 to 6.0 feet
Permeability: Slow or very slow
Dominant parent material: Till
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 8.0 inches
Cation-exchange capacity: 18 to 23 milliequivalents per 100 grams in the surface layer
Similar soils:
- Moderately well drained soils

Composition

Milton and similar soils: 50 percent
Lybrand and similar soils: 50 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

PaA—Pacer silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash terraces
Position on the landform: Flat areas
Size of areas: 5 to 50 acres

Typical Profile

Surface layer:
0 to 10 inches—dark brown, friable silt loam

Subsurface layer:
10 to 14 inches—very dark grayish brown, friable silt loam

Subsoil:
14 to 26 inches—brown, friable gravelly loam
26 to 51 inches—brown, mottled, friable very gravelly loam, gravelly clay loam, and gravelly sandy clay loam
51 to 66 inches—yellowish brown, mottled, firm silt loam

Substratum:
66 to 80 inches—brown, mottled, very firm silt loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Dense, unweathered till at a depth of 40 to 70 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 2.0 to 3.5 feet
Permeability: Moderate in the upper part; moderately slow to very slow in the lower part
Dominant parent material: Outwash and till

Organic matter content in the surface layer: 3.0 to 5.0 percent
Available water capacity: About 6.8 inches
Cation-exchange capacity: 15 to 21 milliequivalents per 100 grams in the surface layer
Similar soils:
- Well drained soils that do not have a till substratum

Composition

Pacer and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Millgrove soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

PwA—Pewamo silty clay loam, 0 to 1 percent slopes

Setting

Landform: Ground moraines, end moraines
Position on the landform: Depressions, flat areas, drainageways (fig. 10)
Size of areas: 2 to 500 acres
Special features: Subject to ponding

Typical Profile

Surface layer:
0 to 9 inches—very dark gray, friable and firm silty clay loam

Subsurface layer:
9 to 13 inches—very dark gray, mottled, firm silty clay

Subsoil:
13 to 20 inches—dark grayish brown, mottled, firm silty clay
20 to 57 inches—yellowish brown, mottled, firm silty clay and silty clay loam
57 to 68 inches—brown, mottled, firm silty clay loam

Substratum:
68 to 80 inches—brown, firm silty clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Root zone: Unweathered till at a depth of 40 to 70 inches
Drainage class: Very poorly drained
Kind of water table: Apparent
Water table depth: 1.0 foot above to 0.5 foot below the surface
Ponding duration: Brief
Permeability: Moderately slow
Dominant parent material: Till
Organic matter content in the surface layer: 3.0 to 5.0 percent
Potential for frost action: High
Available water capacity: About 10.3 inches
Cation-exchange capacity: 10 to 25 milliequivalents per 100 grams in the surface layer
Special features: High clay content in the surface layer; hydric soil
Similar soils:
- Soils that have a thicker surface layer
- Soils that have a thinner surface layer
- Soils that have lenses of very fine sand and silt in the substratum

Composition

Pewamo and similar soils: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

- Bennington or Blount soils on slight rises and near the edges of the mapped areas

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

Pz—Pits, gravel

Setting

Landform: Outwash terraces
Position on the landform: Depressions

Figure 10.—Harvesting soybeans in an area of Pewamo silty clay loam, 0 to 1 percent slopes.

Size of areas: 2 to 5 acres

General Description

- This map unit consists of abandoned gravel pits ranging from 20 to 30 feet deep. Some of the pits contain trash.

Composition

Pits: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

- Gallman, Leoni, or Scioto soils near the edges of the mapped areas
- Udorthents intermixed throughout the mapped areas

RdB2—Rarden silt loam, 2 to 6 percent slopes, eroded

Setting

Landform: Dissected areas on till plains
Position on the landform: Summits
Size of areas: 2 to 5 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 3 inches—dark yellowish brown, friable silt loam

Subsoil:
3 to 5 inches—dark yellowish brown and strong brown, firm silty clay loam
5 to 9 inches—reddish brown, firm silty clay
9 to 33 inches—red and reddish brown, mottled, firm silty clay and silty clay loam

Bedrock:
33 to 43 inches—light olive brown, soft shale

Soil Properties and Qualities

Depth class: Moderately deep (20 to 40 inches)
Root zone: Shale bedrock at a depth of 20 to 40 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Slow
Dominant parent material: Residuum derived from shale
Organic matter content in the surface layer: 1.0 to 3.0 percent

Shrink-swell potential: High
Potential for frost action: High
Available water capacity: About 4.4 inches
Cation-exchange capacity: 5 to 17 milliequivalents per 100 grams in the surface layer
Similar soils:
- Better drained soils
- Somewhat poorly drained soils that have shale bedrock at a depth of 40 to 60 inches

Composition

Rarden and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

RdC2—Rarden silt loam, 6 to 15 percent slopes, eroded

Setting

Landform: Dissected areas on till plains
Position on the landform: Shoulders, summits
Size of areas: 2 to 5 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 3 inches—brown, friable silt loam

Subsoil:
3 to 12 inches—reddish brown, firm silty clay loam and silty clay
12 to 22 inches—reddish brown, mottled, firm silty clay

Substratum:
22 to 34 inches—light olive brown, mottled, firm silty clay loam

Bedrock:
34 to 44 inches—dark grayish brown, soft shale

Soil Properties and Qualities

Depth class: Moderately deep (20 to 40 inches)
Root zone: Shale bedrock at a depth of 20 to 40 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Slow
Dominant parent material: Residuum derived from shale
Organic matter content in the surface layer: 1.0 to 3.0 percent
Shrink-swell potential: High
Potential for frost action: High
Available water capacity: About 4.4 inches
Cation-exchange capacity: 5 to 17 milliequivalents per 100 grams in the surface layer
Similar soils:
- Better drained soils

Composition

Rarden and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Centerburg soils in the higher positions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

RdF2—Rarden silt loam, 20 to 50 percent slopes, eroded

Setting

Landform: Dissected areas on till plains
Position on the landform: Backslopes
Size of areas: 10 to 50 acres
Special features: Steep slopes

Typical Profile

Surface layer:
0 to 3 inches—brown, friable silt loam

Subsoil:
3 to 6 inches—strong brown, firm silty clay loam
6 to 28 inches—yellowish red and reddish brown, mottled, firm silty clay

28 to 38 inches—yellowish red, mottled, firm silty clay loam

Bedrock:
38 to 48 inches—dark reddish gray and olive brown, soft shale

Soil Properties and Qualities

Depth class: Moderately deep (20 to 40 inches)
Root zone: Shale bedrock at a depth of 20 to 40 inches
Drainage class: Moderately well drained
Kind of water table: Perched
Depth to the water table: 1 to 2 feet
Permeability: Slow
Dominant parent material: Residuum derived from shale
Organic matter content in the surface layer: 1.0 to 3.0 percent
Shrink-swell potential: High
Potential for frost action: High
Available water capacity: About 4.9 inches
Cation-exchange capacity: 5 to 17 milliequivalents per 100 grams in the surface layer
Similar soils:
- Better drained soils
- Soils that have shale bedrock within a depth of 20 inches
- Well drained soils that have sandstone bedrock at a depth of 20 to 40 inches

Composition

Rarden and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

RoA—Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains
Position on the landform: Flat areas
Size of areas: 5 to 50 acres

Typical Profile

Surface layer:
0 to 14 inches—very dark grayish brown, friable silt loam

Subsurface layer:
14 to 20 inches—dark brown, friable silt loam

Subsoil:
20 to 67 inches—brown, friable silt loam

Substratum:
67 to 80 inches—brown, mottled, friable, stratified silt loam and loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Kind of water table: Apparent
Depth to the water table: 3.5 to 6.0 feet
Flooding duration: Very brief
Permeability: Moderate
Dominant parent material: Alluvium
Organic matter content in the surface layer: 4.0 to 8.0 percent
Available water capacity: About 11.7 inches
Cation-exchange capacity: 13 to 32 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have a thicker surface layer
- Moderately well drained soils

Composition

Rossburg and similar soils: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

- Sloan soils in old stream channels
- Gallman soils in the higher positions
- Scioto soils in the higher positions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

RsA—Rossburg-Sloan complex, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Rossburg—natural levees on flood plains; Sloan—flood plains
Position on the landform: Rossburg—slightly higher areas adjacent to the stream channel; Sloan—backswamps, old stream channels
Size of areas: 5 to 200 acres
Special features: The Sloan soil is subject to ponding.

Typical Profile

Rossburg

Surface layer:
0 to 12 inches—dark brown, friable silt loam

Subsoil:
12 to 40 inches—brown, friable silt loam

Substratum:
40 to 80 inches—brown, mottled, friable silt loam

Sloan

Surface layer:
0 to 9 inches—very dark grayish brown, friable silt loam

Subsurface layer:
9 to 15 inches—very dark gray, friable silt loam

Subsoil:
15 to 35 inches—dark gray, mottled, friable silt loam

Substratum:
35 to 80 inches—dark gray, mottled, firm silty clay loam

Soil Properties and Qualities

Rossburg

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Kind of water table: Apparent
Depth to the water table: 3.5 to 6.0 feet
Flooding duration: Very brief
Permeability: Moderate
Dominant parent material: Alluvium
Organic matter content in the surface layer: 4.0 to 8.0 percent
Available water capacity: About 9.8 inches
Cation-exchange capacity: 13 to 32 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have a thicker surface layer
- Moderately well drained soils
- Soils that have a lighter colored surface layer

Sloan

Depth class: Very deep (more than 80 inches)
Drainage class: Very poorly drained
Kind of water table: Apparent
Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Brief
Flooding duration: Brief
Permeability: Moderate or moderately slow
Dominant parent material: Alluvium
Organic matter content in the surface layer: 3.0 to 6.0 percent
Potential for frost action: High
Available water capacity: About 10.5 inches
Cation-exchange capacity: 13 to 26 milliequivalents per 100 grams in the surface layer
Special features: Hydric soil
Similar soils:
- Soils that have a lighter colored surface layer

Composition

Rossburg and similar soils: 50 percent
Sloan and similar soils: 40 percent
Dissimilar components: 10 percent

Dissimilar Components

- Gallman soils in the higher positions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

ScA—Scioto silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash terraces
Position on the landform: Flat areas
Size of areas: 10 to 50 acres

Typical Profile

Surface layer:
0 to 10 inches—brown, friable silt loam

Subsoil:
10 to 16 inches—brown, firm clay
16 to 28 inches—brown, firm extremely cobbly silty clay loam
28 to 51 inches—yellowish brown, firm extremely cobbly silt loam and extremely cobbly loam

Substratum:
51 to 80 inches—yellowish brown, friable extremely stony coarse sandy loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate or moderately slow in the upper part of the subsoil; moderate or moderately rapid in the lower part of the subsoil and in the substratum
Dominant parent material: Outwash
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 5.3 inches
Cation-exchange capacity: 15 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
• Soils that have more sand and less clay in the substratum

Composition

Scioto and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

• Glynwood soils near the base of sloping areas

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

• “Woodland Management and Productivity” section
• “Crops and Pasture” section
• “Land Capability Classification” section
• “Recreation” section
• “Wildlife Habitat” section
• “Engineering” and “Soil Properties” sections

ScB—Scioto silt loam, 2 to 6 percent slopes

Setting

Landform: Outwash terraces, eskers
Position on the landform: Rises, shoulders, summits, backslopes
Size of areas: 5 to 40 acres

Typical Profile

Surface layer:
0 to 12 inches—brown, friable silt loam

Subsoil:
12 to 20 inches—brown, firm silty clay loam
20 to 25 inches—brown, friable very gravelly silty clay loam
25 to 37 inches—dark yellowish brown, friable extremely gravelly loam

Substratum:
37 to 80 inches—yellowish brown, friable extremely stony sandy loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate or moderately slow in the upper part of the subsoil; moderate or moderately rapid in the lower part of the subsoil and in the substratum
Dominant parent material: Outwash
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 5.3 inches
Cation-exchange capacity: 15 to 22 milliequivalents per 100 grams in the surface layer
Similar soils:
• Soils that have more sand and less clay in the substratum
• Soils that have an eroded surface layer

Composition

Scioto and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

• Glynwood soils near the base of sloping areas

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

• “Woodland Management and Productivity” section
• “Crops and Pasture” section
• “Land Capability Classification” section
• “Recreation” section
• “Wildlife Habitat” section
• “Engineering” and “Soil Properties” sections

SdC2—Scioto silty clay loam, 6 to 12 percent slopes, eroded

Setting

Landform: Outwash terraces, eskers, kames
Position on the landform: Rises, shoulders, summits, backslopes
Size of areas: 2 to 20 acres
Special features: Part of the original surface layer has been removed.

Typical Profile

Surface layer:
0 to 5 inches—dark yellowish brown, friable silty clay loam

Subsoil:
5 to 15 inches—yellowish brown and brown, firm silty clay loam and silty clay
15 to 55 inches—yellowish brown, friable extremely gravelly silty clay loam and extremely cobbly clay loam

Substratum:
55 to 80 inches—yellowish brown, friable extremely cobbly loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate or moderately slow in the upper part of the subsoil; moderate or moderately rapid in the lower part of the subsoil and in the substratum
Dominant parent material: Outwash
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 5.1 inches
Cation-exchange capacity: 17 to 27 milliequivalents per 100 grams in the surface layer
Special features: High clay content in the surface layer
Similar soils:
- Soils that have more sand and less clay in the substratum
- Soils that have a severely eroded surface layer

Composition

Scioto and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Millgrove soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

SfA—Scioto silt loam, 0 to 2 percent slopes, rarely flooded

Setting

Landform: Outwash terraces
Position on the landform: Flat areas
Size of areas: 5 to 20 acres

Typical Profile

Surface layer:
0 to 9 inches—dark brown, friable silt loam

Subsurface layer:
9 to 14 inches—dark yellowish brown and dark brown, friable silt loam

Subsoil:
14 to 20 inches—dark yellowish brown, firm clay loam
20 to 40 inches—dark yellowish brown, friable and very friable extremely cobbly clay loam and extremely cobbly loam

Substratum:
40 to 80 inches—yellowish brown, friable extremely cobbly sandy loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Well drained
Depth to the water table: Greater than 6 feet
Permeability: Moderate or moderately slow in the upper part of the subsoil; moderate or moderately rapid in the lower part of the subsoil and in the substratum
Dominant parent material: Outwash
Organic matter content in the surface layer: 1.0 to 3.0 percent
Available water capacity: About 5.6 inches
Cation-exchange capacity: 15 to 22 milliequivalents per 100 grams in the surface layer

Similar soils:
- Soils that have a thicker surface layer
- Soils that have a water table in the lower part and have a darker surface layer

Composition

Scioto and similar soils: 100 percent

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

SgA—Shoals silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains
Position on the landform: Flat areas
Size of areas: 5 to 20 acres

Typical Profile

Surface layer:
0 to 10 inches—dark grayish brown, friable silt loam

Subsoil:
10 to 21 inches—grayish brown, mottled, friable silt loam with strata of very fine sandy loam
21 to 29 inches—yellowish brown, mottled, very friable loam with strata of silt loam and sandy loam

Substratum:
29 to 60 inches—brown and yellowish brown, mottled, very friable and friable, stratified loam, silt loam, and sandy loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Somewhat poorly drained
Kind of water table: Apparent
Depth to the water table: 0.5 foot to 1.5 feet
Flooding duration: Brief
Permeability: Moderate
Dominant parent material: Alluvium
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 10.7 inches
Cation-exchange capacity: 12 to 27 milliequivalents per 100 grams in the surface layer
Similar soils:
- Moderately well drained soils

Composition

Shoals and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Sloan soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- "Woodland Management and Productivity" section
- "Crops and Pasture" section
- "Land Capability Classification" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" and "Soil Properties" sections

SkA—Sloan silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains (fig. 11)
Position on the landform: Depressions, backswamps
Size of areas: 5 to 100 acres
Special features: Subject to ponding

Typical Profile

Surface layer:
0 to 12 inches—very dark gray, friable silt loam

Subsoil:
12 to 48 inches—dark gray and dark grayish brown, mottled, firm silty clay loam and clay loam

Substratum:
48 to 80 inches—dark gray and very dark gray, friable gravelly clay loam and gravelly silt loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Very poorly drained
Kind of water table: Apparent
Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Brief

Figure 11.—Dairy heifers grazing in an area of Sloan silt loam, 0 to 2 percent slopes, occasionally flooded. The higher areas on the left are Scioto silt loam, 2 to 6 percent slopes.

Flooding duration: Brief
Permeability: Moderate or moderately slow
Dominant parent material: Alluvium
Organic matter content in the surface layer: 3.0 to 6.0 percent
Potential for frost action: High
Available water capacity: About 10.6 inches
Cation-exchange capacity: 13 to 26 milliequivalents per 100 grams in the surface layer
Special features: Hydric soil
Similar soils:

- Soils that are subject to frequent flooding
- Soils that have a substratum at a depth of 60 to 80 inches
- Soils that have a lighter colored surface layer

Composition

Sloan and similar soils: 90 percent
Dissimilar components: 10 percent

Dissimilar Components

- Lobdell soils in thin strips adjacent to stream channels

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

SnA—Sloan silt loam, till substratum, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains
Position on the landform: Flat areas, backswamps, old stream channels
Size of areas: 5 to 100 acres
Special features: Subject to ponding

Typical Profile

Surface layer:
0 to 13 inches—very dark grayish brown, friable silt loam

Subsurface layer:
13 to 19 inches—very dark gray, very friable silty clay loam

Subsoil:
19 to 37 inches—dark gray and grayish brown, mottled, friable loam

Substratum:
37 to 61 inches—gray, grayish brown, dark gray, and very dark gray, friable, stratified gravelly loam, very gravelly loam, loam, and silt loam
61 to 80 inches—dark gray, firm clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Very poorly drained
Kind of water table: Apparent
Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Brief
Flooding duration: Brief
Permeability: Moderate or moderately slow
Dominant parent material: Alluvium overlying till
Organic matter content in the surface layer: 3.0 to 6.0 percent
Potential for frost action: High
Available water capacity: About 10.4 inches
Cation-exchange capacity: 20 to 32 milliequivalents per 100 grams in the surface layer
Special features: Hydric soil
Similar soils:
- Soils that are subject to frequent flooding
- Soils that have a till substratum at a depth of more than 80 inches
- Soils that have a lighter colored surface layer

Composition

Sloan and similar soils: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

- Millgrove soils in the higher positions
- Pewamo soils interfingering along the edges of the mapped areas
- Shoals soils in thin strips adjacent to stream channels

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

SoA—Sloan silty clay loam, till substratum, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains
Position on the landform: Flat areas, backswamps, old stream channels
Size of areas: 5 to 100 acres
Special features: Subject to ponding

Typical Profile

Surface layer:
0 to 12 inches—very dark grayish brown, friable silty clay loam

Subsurface layer:
12 to 22 inches—very dark grayish brown, mottled, very friable silty clay loam

Subsoil:
22 to 47 inches—dark gray, mottled, friable loam and clay loam

Substratum:
47 to 75 inches—gray, grayish brown, dark grayish brown, dark gray, and very dark gray, friable, stratified clay loam, very gravelly clay loam, loam, and silt loam
75 to 80 inches—gray, firm clay loam

Soil Properties and Qualities

Depth class: Very deep (more than 80 inches)
Drainage class: Very poorly drained
Kind of water table: Apparent

Water table depth: 1 foot above to 1 foot below the surface
Ponding duration: Brief
Flooding duration: Brief
Permeability: Moderate or moderately slow
Dominant parent material: Alluvium overlying till
Organic matter content in the surface layer: 3.0 to 6.0 percent
Potential for frost action: High
Available water capacity: About 10.8 inches
Cation-exchange capacity: 20 to 35 milliequivalents per 100 grams in the surface layer
Special features: High clay content in the surface layer; hydric soil
Similar soils:
- Soils that are subject to frequent flooding
- Soils that have a till substratum at a depth of more than 80 inches
- Soils that have a lighter colored surface layer

Composition

Sloan and similar soils: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

- Pewamo soils interfingering along the edges of the mapped areas
- Shoals soils in thin strips adjacent to stream channels

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

SsA—Smothers silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines
Position on the landform: Flat areas
Size of areas: 2 to 50 acres

Typical Profile

Surface layer:
0 to 10 inches—dark grayish brown, friable silt loam

Subsoil:
10 to 22 inches—yellowish brown, mottled, firm silty clay
22 to 30 inches—dark yellowish brown, mottled, firm extremely flaggy silty clay

Bedrock:
30 to 31 inches—light olive brown, hard sandstone

Soil Properties and Qualities

Depth class: Moderately deep (20 to 40 inches)
Root zone: Sandstone bedrock at a depth of 20 to 40 inches
Drainage class: Somewhat poorly drained
Kind of water table: Perched
Depth to the water table: 0.5 to 1.0 foot
Permeability: Slow
Dominant parent material: Till overlying sandstone
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 4.6 inches
Cation-exchange capacity: 16 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
- Soils that have sandstone bedrock at a depth of 40 to 60 inches

Composition

Smothers and similar soils: 95 percent
Dissimilar components: 5 percent

Dissimilar Components

- Pewamo soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

SsB—Smothers silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines
Position on the landform: Rises, knolls, backslopes
Size of areas: 2 to 30 acres

Typical Profile

Surface layer:
0 to 3 inches—very dark grayish brown, friable silt loam

Subsurface layer:
3 to 9 inches—light brownish gray, friable silt loam

Subsoil:
9 to 29 inches—yellowish brown, mottled, firm silty clay loam
29 to 33 inches—yellowish brown, mottled, firm very channery silty clay

Bedrock:
33 to 34 inches—olive brown, hard sandstone

Soil Properties and Qualities

Depth class: Moderately deep (20 to 40 inches)
Root zone: Sandstone bedrock at a depth of 20 to 40 inches
Drainage class: Somewhat poorly drained
Kind of water table: Perched
Depth to the water table: 0.5 to 1.0 foot
Permeability: Slow
Dominant parent material: Till overlying sandstone
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 4.9 inches
Cation-exchange capacity: 16 to 20 milliequivalents per 100 grams in the surface layer
Similar soils:
• Soils that have sandstone bedrock at a depth of 40 to 60 inches

Composition

Smothers and similar soils: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

- Pewamo soils in depressions
- Loudonville soils at the edges of the mapped areas

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

StA—Stone silty clay loam, 0 to 2 percent slopes

Setting

Landform: Outwash terraces, outwash plains, abandoned stream terraces
Position on the landform: Flat areas, depressions
Size of areas: 10 to 100 acres

Typical Profile

Surface layer:
0 to 12 inches—very dark gray, firm silty clay loam

Subsoil:
12 to 20 inches—light olive brown, mottled, firm clay loam and silty clay loam
20 to 30 inches—light olive brown, mottled, friable very gravelly silt loam

Substratum:
30 to 42 inches—yellowish brown, mottled, friable very cobbly loam

Bedrock:
42 to 43 inches—white and gray, hard, highly fractured limestone

Soil Properties and Qualities

Depth class: Deep (40 to 60 inches)
Root zone: Limestone bedrock at a depth of 40 to 60 inches
Drainage class: Somewhat poorly drained
Kind of water table: Apparent
Depth to the water table: 0.5 to 1.0 foot
Permeability: Moderately slow in the upper part; moderate or moderately rapid in the lower part
Dominant parent material: Drift overlying limestone or dolostone
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 5.8 inches
Cation-exchange capacity: 20 to 35 milliequivalents per 100 grams in the surface layer
Special features: High clay content in the surface layer
Similar soils:
• Soils that have limestone bedrock at a depth of 60 to 80 inches
• Soils that have a lighter colored surface layer

Composition

Stone and similar soils: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

- Millgrove soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

SuA—Stone clay loam, 0 to 2 percent slopes, rarely flooded

Setting

Landform: Outwash terraces, outwash plains, abandoned stream terraces
Position on the landform: Flat areas, depressions
Size of areas: 20 to 100 acres

Typical Profile

Surface layer:
0 to 12 inches—very dark grayish brown, firm clay loam

Subsoil:
12 to 29 inches—yellowish brown, mottled, firm clay loam
29 to 34 inches—grayish brown, mottled, firm gravelly loam

Substratum:
34 to 44 inches—gray, mottled, firm extremely channery loam

Bedrock:
44 to 45 inches—light gray, hard, fractured dolostone

Soil Properties and Qualities

Depth class: Deep (40 to 60 inches)
Root zone: Limestone bedrock at a depth of 40 to 60 inches
Drainage class: Somewhat poorly drained
Kind of water table: Apparent
Depth to the water table: 0.5 to 1.0 foot
Permeability: Moderately slow in the upper part; moderate or moderately rapid in the lower part
Dominant parent material: Drift overlying limestone or dolostone
Organic matter content in the surface layer: 2.0 to 4.0 percent
Potential for frost action: High
Available water capacity: About 6.5 inches
Cation-exchange capacity: 20 to 35 milliequivalents per 100 grams in the surface layer
Special features: High clay content in the surface layer
Similar soils:
- Soils that have limestone bedrock at a depth of 60 to 80 inches
- Soils that have a lighter colored surface layer

Composition

Stone and similar soils: 85 percent
Dissimilar components: 15 percent

Dissimilar Components

- Millgrove soils in depressions
- Scioto soils interfingering along the edges of the mapped areas

Management

For general and detailed information about managing this map unit, see the following sections and their corresponding tables:

- “Woodland Management and Productivity” section
- “Crops and Pasture” section
- “Land Capability Classification” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” and “Soil Properties” sections

Uc—Udorthents

Setting

Landform: Ground moraines, end moraines, outwash terraces
Position on the landform: Shoulders, summits, flat areas
Size of areas: 2 to 50 acres

Typical Profile

Surface soil:
0 to 26 inches—yellowish brown, mottled, friable loam and clay loam

Substratum:
26 to 80 inches—brown, firm silty clay loam

Soil Properties and Qualities

General description: This map unit consists of areas previously mapped as Borrow pit, Gravel pit, and

Made land. Areas in the city of Delaware that were previously mapped as Gravel pit did not contain any gravel. Some of these areas and areas mapped as Made land were excavated for clay and have been subsequently filled with soil and, in some areas, used as sites for landfill. Some areas previously mapped as Borrow pit are along I-71 and are filled with water; others do not contain any water but support little vegetation. Slope generally ranges from 0 to 6 percent.
Dominant parent material: Till

Composition

Udorthents: 100 percent

UdB—Udorthents, clayey-Urban land complex, undulating

Setting

Landform: Ground moraines, end moraines, outwash terraces
Position on the landform: Shoulders, summits, flat areas
Size of areas: 20 to 1,000 acres

Typical Profile

Udorthents

Surface soil:
0 to 37 inches—yellowish brown and brown, mottled, firm silty clay loam and clay loam

Substratum:
37 to 80 inches—brown, firm silty clay loam

Component Properties and Qualities

Udorthents

General description: This component consists of areas that have had soil material either added or removed during construction. Slope generally ranges from 0 to 6 percent.
Dominant parent material: Till
Special features: High clay content in the subsoil

Urban land

General description: This component is characterized by streets, parking lots, buildings, and buried utilities. Slope generally ranges from 0 to 2 percent.

Composition

Udorthents: 45 percent
Urban land: 40 percent
Dissimilar components: 15 percent

Dissimilar Components

- Pewamo soils in drainageways
- Bennington or Blount soils on the more nearly level or gentler slopes
- Cardington or Glynwood soils on the more nearly level or gentler slopes

Up—Udorthents-Pits complex

Setting

Landform: Ground moraines, end moraines, outwash terraces
Position on the landform: Depressions, shoulders, summits
Size of areas: 2 to 100 acres

Typical Profile

Udorthents

Substratum:
0 to 80 inches—mixed brown and strong brown, gravelly clay loam and gravelly loam

Component Properties and Qualities

Udorthents

General description: Areas around limestone quarries that contain piles of overburden consisting of remnants of natural soils and limestone waste products, such as impure limestone layers; slope generally ranges from 0 to 15 percent.

Pits

General description: Limestone quarries that are sometimes partially filled with water

Composition

Udorthents: 50 percent
Pits: 35 percent
Dissimilar components: 15 percent

Dissimilar Components

- Blount or Bennington soils near the edges of the mapped areas
- Glynwood, Cardington, or Centerburg soils near the edges of the mapped areas
- Milton or Amanda soils near the edges of the mapped areas

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and for hay and pasture is suggested in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained, prime farmland is described, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the information given in the description of each soil under the heading “Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or Ohio State University Extension.

In 1990, about 182,000 acres in Delaware County, or 64 percent of the total land area, was used for farming. This acreage decreased from 212,000 acres, or 75 percent of the total land area, in 1980 (Crawford, 1992). In 1995, about 72,200 acres was used for soybeans, 43,300 acres for corn, 18,800 acres for wheat, and 8,300 acres for hay (Ohio Agricultural Statistics Service, 1996).

Major soil management concerns are based upon similarities and differences in soil properties and qualities associated with the different kinds of soil. The major soil management concerns are seasonal wetness (including ponded areas), erosion, soil structure damage (compaction, crusting, clod formation), droughtiness, and soil fertility.

Seasonal wetness and included ponded areas are the major management concerns on about 109,000 acres of land used for crops and pasture in the county. The very poorly drained Condit, Millgrove, Pewamo, and Sloan soils are naturally so wet that crop production is generally not possible unless surface and subsurface drainage systems are installed. The somewhat poorly drained Bennington, Blount, Hyatts, Jimtown, Smothers, and Stone soils are naturally so wet that crops are damaged during most years and planting and harvesting are delayed unless subsurface drainage systems are installed.

Small tracts of wet soils in seepy areas, along drainageways, and in swales are commonly mapped as included soils in areas of the moderately well drained Cardington, Centerburg, Glynwood, Lobdell, and Pacer soils. Random subsurface drainage systems are installed in these areas for maximum crop yields.

The design of surface and subsurface drainage systems varies with the kind of soil. A combination of surface and subsurface drainage is needed in many areas of very poorly drained Condit, Millgrove, Pewamo, and Sloan soils used for intensive crop production. Drains should be more closely spaced in soils that have slow permeability than in soils that have moderately slow permeability. Bennington, Blount, Condit, Hyatts, and Smothers soils have slow or very slow permeability.

Establishing adequate outlets for subsurface drainage systems can be difficult in some areas of Condit, Pewamo, Millgrove, Sloan, and Stone soils. Existing county and private drainage systems should be maintained as adequate outlets for present and future land uses. These systems often become outlets for basement and septic system curtain drains in many areas of Delaware County. Urban construction activities can damage and disrupt these existing systems. As a result, renewed wetness and ponding of these previously drained cropland areas now impact homeowners' use of this land. Correcting these problems may be very difficult because of the need for cooperation among many homeowners in efforts to reestablish the drainage systems.

Information about the design of drainage systems for each kind of soil is provided in the Field Office Technical Guide, which is available in the local office of the Natural Resources Conservation Service and the Delaware Soil and Water Conservation District.

Erosion by water is a major concern on about 38,000 acres of cropland and pasture in the county. On bare soils, erosion is generally a hazard where the slope is more than 2 percent. The hazard increases as the percent of slope increases.

Erosion reduces natural soil fertility and productivity as the original topsoil is removed and the more acid subsoil is incorporated into the surface layer through tillage. The need for lime and fertilizer to replace lost plant nutrients and maintain productivity is increased. If the amount of annual soil loss exceeds the rate at which new soil is formed, long-term productivity and natural fertility will be impaired. Loss of the original topsoil is of great concern on soils that have a high content of clay in the subsoil, such as Bennington, Blount, Cardington, Glynwood, Hyatts, Lybrand, Milton, Rarden, and Smothers soils.

Erosion increases the cost of crop production, results in poor soil structure in the surface layer, increases the need for tillage to incorporate organic matter into the surface layer, and reduces the available water capacity of the surface layer. Tillage for preparing a good seedbed requires more energy in eroded areas of many sloping fields. Smaller plant populations result from inadequate soil-to-seed contact and lower available water. These eroded spots are common in areas of the eroded Glynwood, Lybrand, Rarden, and Scioto soils.

Eroding soil particles with attached nutrients, herbicides, and pesticides enter drainageways, streams, rivers, ponds, lakes, and reservoirs. These sediments can fill drainage ditches and block subsurface drainage outlets. Sediment removal is the largest cost item in ditch maintenance. Controlling erosion protects the soil resource base, maintains long-term productivity, reduces the cost of drainage maintenance, and improves water quality.

Management measures that control erosion include crop rotations, cover crops, crop residue management, grassed waterways, conservation tillage, and spring plowing rather than fall plowing. Management measures that conform to a particular cropping system can be selected to keep soil loss at a level that will not reduce long-term productivity.

Crop rotations that include cover crops and grasses and legumes reduce the hazard of erosion by providing plant cover for extended periods. These rotations protect bare soil from the erosive forces of raindrop impact and water runoff. The rate of water infiltration increases as soil structure improves in the surface layer. The proportion of hay or pasture in the rotation should increase as the degree of slope increases.

A system of conservation tillage, including no-till planting, that leaves crop residue on the surface can help to control erosion on most of the soils in the county. Such a system is best suited to well drained and moderately well drained soils that dry and warm early in the spring. Installing surface and subsurface drainage on somewhat poorly drained and very poorly drained soils is necessary if conservation tillage systems are used. A high level of management, including weed and insect control, also is needed.

Terms used to describe soil structure damage in the surface layer include compaction, crusting, and clod formation.

Surface compaction is a general management concern on all of the cropland in the county. Pressure applied to the land surface by farm machinery can cause compaction when the soil is soft and compressible because of wetness. As soil structural units are mashed and smeared, the pore space occupied by air and water within these structural units and between the structural units is reduced. Air and water movement into and out of the soil is also restricted. As a result, water ponds on the surface. This ponding is especially noticeable at the ends of fields, where traffic is common. Lower crop yields are common in these areas because root penetration is restricted to the upper part of the subsoil.

Factors that affect compaction on all soils regardless of use include size, weight, and design of machinery (pounds of force per square inch of soil surface area) and the type of farm implements (wheeled versus tracked).

In addition to compaction, soil texture and soil moisture content also affect crusting and clod formation. Crusting, or hardening of the bare soil surface, follows intense rainfall as soon as the surface layer starts to dry. Most of the soils in Delaware County have a surface layer of silt loam or silty clay loam. A crust will form in these soils as the granular soil structure is destroyed by tillage. This crust must be broken before some crop seedlings will be able to emerge, especially in areas that are continuously row cropped and in which conventional tillage systems are used.

Clod formation, or hardening of the entire surface layer, follows tillage when the soil moisture content is too high. It is most noticeable on soils that have a surface layer of silty clay loam (fig. 12). Additional tillage is needed to break up these clods and to facilitate preparation of a good seedbed. Unless adequate rain is received soon after planting, lower plant populations result from inadequate soil-to-seed contact and inadequate available water.

Compaction, crusting, and clod formation can be minimized by tilling the soil at the proper soil moisture content. Also, minimizing tillage helps to prevent the destruction of soil structure. No-till systems initially result in less pore space for air and water movement. After 2 or 3 years, however, new soil structural units are formed and pore space increases. More roots in the soil contribute to better soil structure. This condition is most noticeable in all soils that have a grass cover crop or where grass is included in the hay part of the crop rotation and in pastures dominated by permanent grass.

Droughtiness is an insufficient amount of water available for good crop growth between rains. Some crops, such as soybeans, are more tolerant of droughty conditions than other crops, such as corn. Some soils have a higher available water capacity than others. Soils that are considered to be droughty soils used as cropland or pasture in Delaware County are the severely eroded Glynwood soils that have slopes of 6 to 12 percent; Loudonville soils that have slopes of 2 to 6 percent; the severely eroded Lybrand soils that have slopes of 12 to 18 percent; Milton soils that have slopes of 2 to 18 percent; Rarden soils that have slopes of 2 to 15 percent; Scioto soils that have slopes of 0 to 12 percent; and Smothers soils that have slopes of 0 to 6 percent. Moderate depth to bedrock, stony or gravelly material in the lower part of the subsoil, severe erosion, or any combination of these soil properties and qualities results in low available water capacity.

Many of the soils in which moisture shortages occur are well suited to a system of conservation tillage, such as no-till planting, that leaves crop residue on the surface. The crop residue increases the moisture supply by increasing the rate of water infiltration and by reducing runoff and evaporation rates.

The fertility of a soil depends on the natural fertility level and on past use and management, including previous applications of lime and fertilizer. As a result, fertility can vary widely from field to field, even in areas of the same kind of soil.

About 16 chemical elements are essential to the growth of plants (Ohio Cooperative Extension Service, 1985). High crop yields and productive pastures require adequate levels of plant nutrients, lime, and organic matter. Maintaining these levels results in sustained high yields on all of the soils in the county.

Many nutrients are most readily available to plants where the soil is nearly neutral in reaction (pH). They are less readily available where the soil is more acid or more alkaline. Most of the somewhat poorly drained, moderately well drained, and well drained soils in Delaware County are acid in the upper part of the root zone. In these soils, periodic additions of lime are needed to increase the availability of plant nutrients.

Soil texture, the content of organic matter, and the type of clay minerals influence the cation-exchange capacity of the soil, which affects the storage and availability of nutrients. The ability to store and release plant nutrients increases as the content of clay and organic matter increases. Soils that have a lower content of clay or organic matter have a reduced capacity to store and release nutrients and lose more nutrients through leaching. On these soils, frequent applications of a small amount of fertilizer compensates for the nutrients lost through leaching.

On all soils, additions of lime and fertilizer should be based on the results of soil tests and on crop needs for the expected level of yields. Ohio State University Extension can help in determining the kinds and amounts of fertilizer and lime to be applied.

Organic matter influences many soil properties, including color, structure, tilth, the rate of water infiltration, available water capacity, and cation-exchange capacity. In Delaware County, soils that have a light-colored surface layer generally have a moderate or low content of organic matter in the surface layer. Soils that have a dark surface layer have

Figure 12.—Dried, hard clods in the plowed clayey surface layer of Pewamo silty clay loam, 0 to 1 percent slopes.

a high content of organic matter. Cultivation tends to lower the organic matter content by increasing the rate of oxidation and by increasing the rate of erosion on sloping soils. Returning all crop residue to the soil helps to maintain the organic matter content. Cover crops, sod crops, green manure crops, and additions of manure increase the organic matter content.

Sewage sludge can have economic value as a source of organic matter and some plant nutrients. If the sludge is applied to land, management concerns include the application rate, the hazards associated with heavy metals, possible odor problems, and health hazards. The chemical composition of the sludge should be determined before its application on land. Additions of sludge to cropland should be based on analysis of the sludge, the results of soil tests, and the expected level of crop yields. Ohio State University Extension can provide information about the application of sewage sludge.

Some of the acreage in the county is used as pasture. The more common pasture and hay plants are alfalfa, red clover, alsike clover, bluegrass, orchardgrass, tall fescue, timothy, and bromegrass.

The ability of a pasture to produce forage and to provide enough cover for erosion control is influenced by the number of livestock, the length of the period of grazing, the timeliness of grazing, the forage being grazed, and the availability of water. Good management measures, such as proper stocking rates, pasture rotation, timely deferment of grazing, applications of lime and fertilizer, and control of weeds and insects, help to maintain the key forage plants. Applying herbicides and mowing help to control weeds. The need for lime and fertilizer should be determined by the results of soil tests. The amount of nutrients to be applied should be based on the requirements of the grasses or legumes to be grown.

Erosion control is a major management need on gently sloping to very steep soils used for pasture. The hazard of erosion increases as the slope increases. Many of these soils are already eroded. Control of erosion is particularly important when the pasture is seeded. Using a no-till seeding method or growing small grain as a companion crop can help to control further erosion.

Soil compaction is caused by overgrazing or grazing when the soils are wet. It can greatly reduce the vigor of pasture plants. Also, it can increase the runoff rate and the hazard of erosion on sloping soils. Deferring grazing during wet periods minimizes compaction. Subsurface drains can be effective in removing excess water from pastured areas of soils that are very poorly drained or somewhat poorly drained.

Seeding mixtures should be selected on the basis of soil type and the desired management system. Legumes increase the nutrient value of the forage and provide nitrogen for the growth of grasses. Alfalfa should be seeded on well drained soils that have adequate levels of plant nutrients and lime. The wetter soils are better suited to alsike clover than to red clover. Information about seeding mixtures, herbicide treatment, and other management measures for specific soils can be obtained from local offices of the Natural Resources Conservation Service and Ohio State University Extension.

The specialty crops grown commercially in Delaware County include vegetables, nursery stock, Christmas trees, and fruits. Also, small acreages throughout the county are used for melons, strawberries, raspberries, popcorn, sweet corn, tomatoes, other vegetables, and small fruits. The latest information about growing specialty crops can be obtained from local offices of the Natural Resources Conservation Service and Ohio State University Extension.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the county, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or Ohio State University Extension can provide information about the management and productivity of the soils for those crops.

The crop yield index (table 6) reflects the relative productivity of a soil in relation to other soils in the county. This index is provided to assist in ranking soils by relative productivity within the county. The most productive soil is given a rating of 100, and other soils are ranked against this standard. The index is based on a crop rotation of corn, soybeans, and winter wheat.

Advances in planter technology, crop genetics, drainage, weed control, pest management, soil fertility, and soil management can make a standard yield table obsolete within several years. The yield index in table 6 should provide users with good information on the relative productivity of soils in the county for years to come.

Soils that have slopes of more than 12 percent were not ranked for crop production. These soils were ranked on the basis of estimated pasture and hayland yields.

Some map units are not used for any type of crop production and thus are not rated in the table.

Cropland Limitations and Hazards

The management concerns affecting the use of the detailed soil map units in the county for crops are shown in table 7. The main concerns in managing nonirrigated cropland are controlling water erosion, removing excess water, minimizing surface crusting and compaction, and maintaining soil tilth, organic matter content, and fertility.

Generally, a combination of several practices is needed to control *water erosion*. Conservation tillage, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss.

Surface and/or subsurface drainage is used to lower a *seasonal high water table* and to control *ponding*.

Tilling within the proper range in moisture content minimizes *surface compaction*.

Measures that help to maintain *soil tilth, organic matter content,* and *fertility* include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

Some of the limitations and hazards shown in the table cannot be easily overcome. These include *ponding, flooding, slope, depth to rock,* and *limited organic matter content*.

Ponding.—Surface drains help to remove excess surface water and reduce damage from ponding.

Flooding.—Flooding can damage winter grain and forage crops. A tillage method that partly covers crop residue and leaves a rough or ridged surface helps to prevent the removal of crop residue by floodwater. Tilling and planting should be delayed in the spring until flooding is no longer a hazard.

Slope.—Where the slope is more than 15 percent, water erosion can be excessive on cultivated fields. The selection of crops and the use of equipment are limited. Cultivation may be restricted.

Depth to rock.—Rooting depth and available moisture may be limited by bedrock within a depth of 40 inches.

Limited organic matter content.—Many soils that have a light-colored surface layer have a low or moderately low content of organic matter and weak or moderate structure. Regularly adding crop residue, manure, and other organic materials to the soil maintains or improves the organic matter content and the soil structure.

Additional limitations and hazards are as follows:

Potential for ground-water pollution.—This is a hazard in soils that have excessive permeability or have bedrock or an apparent water table within the profile.

High bulk density in the substratum.—Soil layers with high bulk density have little pore space. These layers limit water storage and restrict the penetration of plant roots.

Limited available water capacity, poor tilth or *fair tilth,* and *surface crusting*.—These limitations can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems.

Excessive permeability.—This limitation causes deep leaching of nutrients and pesticides. The capacity of the soil to retain moisture for plant use is poor. Crops generally respond better to smaller, more frequent applications of fertilizer and lime than to one large application.

Surface rock fragments.—This limitation causes rapid wear of tillage equipment. It cannot be easily overcome.

Surface stones.—Stones or boulders on the surface can hinder normal tillage unless they are removed.

Surface crusting.—Hardening of the bare soil surface can hinder or prevent seedling emergence. Minimizing tillage slows the destruction of soil structure and helps to prevent crusting.

Frost heave.—Frost heaving can damage deep-rooted legumes and some small grain.

Subsidence of organic matter.—Subsidence or shrinking occurs as a result of oxidation in the organic material after the soil is drained. Control of the water table by subirrigation through subsurface drain lines reduces the hazards of subsidence, burning, and soil blowing.

Following is an explanation of the criteria used to determine the limitations or hazards.

Ponding.—Ponding duration is assigned to the component of the map unit.

Frequent flooding.—The component of the map unit is frequently flooded.

Occasional flooding.—The component of the map unit is occasionally flooded.

Rare flooding.—The component of the map unit is subject to rare flooding.

High potential for ground-water pollution.—The soil has an apparent water table within a depth of 4 feet or bedrock within a depth of 60 inches, or permeability is more than 6 inches per hour in at least one layer within the soil.

Moderate potential for ground-water pollution.—Permeability is between 2 and 6 inches per hour in at least one layer within the soil.

Easily eroded.—The surface K factor multiplied by the upper slope limit is more than 2.

Slope.—The upper slope range of the component of the map unit is more than 15 percent.

Most of surface layer removed.—The surface layer of the component of the map unit is severely eroded: 75 percent or more of the original A and E horizons has been lost.

Part of surface layer removed.—The surface layer of the component of the map unit is eroded: 25 to 75 percent of the original A and E horizons has been lost.

High bulk density in the substratum.—At least one layer within a depth of 40 inches has a bulk density of more than 1.75.

Limited available water capacity.—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 6 inches or less.

Depth to rock.—Bedrock is within a depth of 40 inches.

Excessive permeability.—The upper limit of the permeability range is 6 inches or more within the soil profile.

Surface stones.—The terms describing the texture of the surface layer include any stony or bouldery modifier, or the soil is a stony or bouldery phase.

Surface rock fragments.—The terms describing the texture of the surface layer include any rock fragment modifier except for gravelly or channery, and “surface stones” is not already indicated as a limitation.

Seasonal high water table.—The top of the water table in the component of the map unit is at a depth of 1.5 feet or shallower, and ponding duration is not assigned.

Surface compaction.—The component of the map unit has a surface layer of silt loam, silty clay loam, clay loam, or silty clay.

Poor tilth.—The component of the map unit is severely eroded, has less than 1 percent organic matter in the surface layer, or has more than 35 percent clay in the surface layer.

Fair tilth.—The component of the map unit has a surface layer of silty clay loam or clay loam or is a moderately eroded phase of loam or silt loam.

Surface crusting.—The average organic matter content in the surface layer is less than or equal to 3 percent, and the texture is silt loam or silty clay loam.

Limited organic matter content.—The average organic matter content in the surface layer of the component of the map unit is less than or equal to 3 percent.

Frost heave.—The component of the map unit has a high potential for frost action.

Subsidence of organic matter.—The organic matter content in the surface layer of the component of the map unit is greater than or equal to 20 percent.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for pasture and hayland, for woodland, or for engineering purposes.

In the capability system, soils generally are grouped at three levels—capability class, subclass, and unit (USDA, 1961). These categories indicate the degree and kinds of limitations affecting mechanized farming systems that produce the more commonly grown field crops, such as corn, small grain, soybeans, hay, and field-grown vegetables. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a letter, *e, w, s,* or *c*, to the class number, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless a 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 very cold or very dry.

There are no subclasses in class 1 because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in table 5 and in the section “Interpretive Groups.” The acreage of soils in each capability class and subclass is shown in table 8.

Pasture and Hayland Interpretations

Soils are assigned to pasture and hayland groups according to their suitability for the production of forage. The soils in each group are similar enough to be suited to the same species of grasses or legumes, have similar limitations and hazards, require similar management, and have similar productivity levels and other responses to management.

Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

Yield estimates are often provided in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

The pasture and hayland suitability group symbol for each soil is listed in the section “Interpretive Groups.” Soils assigned the same suitability group symbol require the same general management and have about the same potential productivity. The pasture and hayland suitability groups are based on soil characteristics and limitations.

Soils assigned to group A have few limitations affecting the management and growth of climatically adapted plants.

Soils in group A-1 are deep or very deep and are well drained or moderately well drained. They have a surface layer of silt loam or loam. The available water capacity ranges from moderate to very high. These soils respond favorably to additions of lime. Frequent applications may be needed to maintain an adequate pH level. A low pH in the subsoil can shorten the life of some deep-rooted legumes in the stand. Slopes range from 0 to 18 percent.

Soils in group A-2 are deep or very deep and are well drained or moderately well drained. They have a surface layer of silt loam. Available water capacity ranges from moderate to very high. These soils respond favorably to additions of lime. Frequent applications may be needed to maintain an adequate pH level. The low pH of the subsoil can shorten the life of some deep-rooted legumes in the stand. Slopes range from 18 to 25 percent. The slope may interfere with mechanical application of lime and fertilizer and with clipping, mowing, and spraying for weed control. The slope also increases the hazard of erosion if the areas are overgrazed or cultivated for reseeding. These soils are suited to no-till reseedings and interseedings.

Soils in group A-3 are deep or very deep and are well drained or moderately well drained. They have a surface layer of silt loam. Slopes range from 25 to 50 percent. These soils generally are not suited to pasture or hay because of the slope.

Soils in group A-5 are deep or very deep and are well drained or moderately well drained. They are subject to brief or very brief periods of flooding. The flooding limits the use of these soils for pasture during periods of stream overflow, and sediment lowers the quality of the forage. The soils have a surface layer of silt loam. Available water capacity ranges from low to very high. Slopes range from 0 to 2 percent.

Soils in group A-6 are deep or very deep, are well drained or moderately well drained, and are subject to frost action. Frost action can damage legume stands. Mixing fibrous-rooted grasses with legumes and using proper grazing management methods help to prevent the damage caused by frost action. The soils have a surface layer of silt loam or silty clay loam. Available water capacity ranges from low to very high. Slopes range from 0 to 18 percent.

Soils in group B have limited growth and production potential because of droughtiness.

Soils in group B-1 are deep or very deep and are well drained or moderately well drained. They have a surface layer ranging from gravelly loam to silty clay loam. Available water capacity is low or very low. These soils are sandy or skeletal in the subsoil. Slopes range from 0 to 25 percent.

Soils in group C are wet because of a seasonal high water table.

Soils in group C-1 are deep or very deep and are somewhat poorly drained or very poorly drained. They have a surface layer of silt loam or silty clay loam. Available water capacity ranges from moderate to very high. These soils normally respond well to subsurface drainage. Slopes range from 0 to 4 percent.

Soils in group C-2 are moderately deep to very deep and are somewhat poorly drained or very poorly drained. They have a surface layer of silt loam, silty clay loam, or clay loam. Available water capacity ranges from low to very high. A seasonal high water table limits the rooting depth of deep-rooted forage plants. Some of these soils have bedrock at a depth that also restricts root penetration. Shallow-rooted species grow best in areas of these soils. Subsurface drains are used to lower the seasonal high water table. The effectiveness of subsurface drainage is typically restricted by the permeability of the subsoil, the depth to bedrock, or the landscape position of the soil. Because of the limited root zone, the soils in this group are better suited to forage species that do not have a tap root. Slopes range from 0 to 4 percent.

Soils in group C-3 are very deep and are very poorly drained or somewhat poorly drained. They are subject to flooding. The flooding limits the use of these soils for pasture during periods of stream overflow, and sediment lowers the quality of the forage. The soils have a surface layer of silt loam or silty clay loam. Available water capacity ranges from moderate to very high. Slopes range from 0 to 2 percent. Frost action may damage legumes. Including grasses in a seeding mixture and using proper grazing management methods help to prevent the damage caused by frost heaving. A seasonal high water table limits the rooting depth of forage plants. Shallow-rooted species grow best in areas of these soils. Subsurface drains are used to lower the seasonal high water table. The effectiveness of subsurface drainage is restricted by the landscape position of the soils.

Soils in group D are organic soils.

Soils in group D-1 are very deep and are very poorly drained. They formed entirely or partially in organic material. Available water capacity ranges from moderate to very high. Slopes range from 0 to 2 percent.

Soils in group F have only a moderately deep root zone. The growth of climatically adapted plants is restricted in these soils to a depth of 20 to 40 inches. These soils are better suited to forage species that do not have a tap root.

Soils in group F-1 are moderately deep and are well drained or moderately well drained. They have a surface layer of silt loam. Available water capacity is low. These soils are droughty but are suitable for warm-season grasses, such as switchgrass, big bluestem, indiangrass, and Caucasian bluestem. The soils respond favorably to additions of lime. Frequent applications may be needed to maintain an adequate pH level. The low pH of the subsoil in some of these soils can shorten the life of some deep-rooted legumes in the stand. Slopes range from 0 to 18 percent.

Soils in group F-2 are moderately deep and are well drained or moderately well drained. They have a surface layer of silt loam. Available water capacity is low or moderate. Slopes range from 20 to 50 percent. These soils generally are not suited to pasture or hay because of the slope.

Soils in group H-1 are not suited to pasture or hay because they are toxic or because the slope is more than 40 percent.

The local office of the Natural Resources Conservation Service or Ohio State University Extension can provide information about forage yields other than those shown in table 5.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 245,000 acres in the county, or about 86 percent of the total land area, potentially is prime farmland. This land is evenly distributed throughout the county. Areas that qualify as prime farmland in the southern half of the county are increasingly being converted to urban or other uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the county that meet the requirements for prime farmland are listed in table 9.

This list does not constitute a recommendation for a particular land use. On some soils included in the table, measures that overcome limitations are needed. The need for these measures is indicated in parentheses after the map unit name. The location of each map unit is shown on the detailed soil maps. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units."

Erosion Factors

Soil erodibility (K) and soil-loss tolerance (T) factors are used in an equation that predicts the amount of soil lost through water erosion in areas of cropland. The procedure for predicting soil loss is useful in guiding the selection of soil and water conservation practices. Definitions and criteria for the soil erodibility factor (K), fragment-free soil erodibility factor (Kf), soil-loss tolerance factor (T), wind erodibility index, and wind erodibility groups are provided in the section "Physical and Chemical Properties of the Soils." The erosion factors, the wind erodibility index, and the wind erodibility groups for each soil are listed in table 21.

Additional information about wind erodibility groups and K, Kf, and T factors can be obtained from local offices of the Natural Resources Conservation Service or Ohio State University Extension.

Woodland Management and Productivity

Information on woodland management is available from the Ohio Department of Natural Resources, Division of Forestry; Ohio State University Extension; the Farm Services Agency; and the Natural Resources Conservation Service.

Table 10 can be used by forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed.

The table lists the woodland ordination symbol for each soil. The ordination system is a nationwide uniform system of labeling soils or groups of soils that are similar in use and management. The primary factors evaluated in the woodland ordination system are productivity of the forest overstory tree species and the principal soil properties resulting in hazards and limitations that affect forest management. There are three parts of the ordination system—class, subclass, and group. The class and subclass are referred to as the ordination symbol. The ordination symbol listed in the table is for south aspects.

The first element of the ordination symbol is a number that denotes potential productivity in terms of cubic meters of wood per hectare per year for the selected tree species. The larger the number, the greater the potential productivity. Potential productivity is based on site index and the corresponding culmination of the mean annual increment. For example, the number 1 indicates a potential production of 1 cubic meter of wood per hectare per year (14.3 cubic feet per acre per year), and the number 10 indicates a potential production of 10 cubic meters of wood per hectare per year (143 cubic feet per acre per year).

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. It applies to fully stocked, even-aged, unmanaged stands. The site indexes shown in table 10 are averages based on measurements made at sites that are representative of the soil series. When the site index and woodland productivity of different soils are compared, the values for the same tree species should be compared. The higher the site index number, the more productive the soil for that species. Site index values are used in conjunction with yield tables to determine average annual yields. Indirectly, they are used to determine the productivity class in the ordination class symbol.

The second element of the ordination symbol, the subclass, is a capital letter indicating certain soil or physiographic characteristics that contribute to important hazards or limitations to be considered in management. The subclasses are defined as follows:

Subclass X indicates that woodland use and management are limited by stones or rocks.

Subclass W indicates that woodland use and management are significantly limited by excess water, either seasonally or throughout the year. Restricted drainage, a high water table, or flooding can adversely affect either stand development or management.

Subclass T indicates that the root zone has toxic substances. Excessive alkalinity, acidity, sodium salts, or other toxic substances impede the development of desirable species.

Subclass D indicates that woodland use and management are limited by a restricted rooting depth. The rooting depth is restricted by hard bedrock, a hardpan, or other restrictive layers in the soil.

Subclass C indicates that woodland use and management are limited by the kind or amount of clay in the upper part of the soil.

Subclass S indicates that the soil is sandy, has a low available water capacity, and normally has a low content of available plant nutrients. The use of equipment is limited during dry periods.

Subclass F indicates that woodland use and management are limited by a high content of rock fragments that are larger than 2 millimeters and smaller than 10 inches. This subclass includes flaggy soils.

Subclass R indicates that woodland use and management are limited by excessive slope.

Subclass A indicates that no significant limitations affect woodland use and management.

In table 10, the soils are rated for erosion hazard, equipment limitation, seedling mortality, windthrow hazard, and plant competition.

The *erosion hazard* is *slight* if the expected soil loss is small; *moderate* if some measures are needed to control erosion during logging and road construction; and *severe* if intensive management or special equipment and methods are needed to prevent excessive soil loss.

The *equipment limitation* is *slight* if the use of equipment is not limited to a particular kind of equipment or time of year; *moderate* if there is a short seasonal limitation or a need for some modification in the management of equipment; and *severe* if there is a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings are for seedlings that are from a good planting stock and that are properly planted during a period of average rainfall. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate* indicates that the expected mortality is 25 to 50 percent; and *severe* indicates that the expected mortality is more than 50 percent.

The *windthrow hazard* is *slight* if trees in wooded areas are not expected to be blown down by commonly occurring winds; *moderate* if some trees are blown down during periods of excessive soil wetness and strong winds; and *severe* if many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

Plant competition is *slight* if there is little or no competition from other plants; *moderate* if plant competition is expected to hinder the development of a fully stocked stand of desirable trees; and *severe* if plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed for the control of undesirable plants.

The potential productivity of merchantable or *common trees* is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest land managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume* is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Suggested trees to plant are those that are suitable for commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters, a tree or shrub may grow well or grow poorly, depending on the characteristics of the soil. Each tree or shrub has definable potential heights in a given physiographic area and under a given climate. Accurate definitions of potential heights are necessary when a windbreak is planned and designed.

Table 11 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in this table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens.

Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service, Ohio State

University Extension, or the Ohio Department of Natural Resources, Division of Forestry, or from a nursery.

Landscape Plants

The natural landscape of Delaware County has been logged, grazed, and cropped since the early 1800's. Agricultural land users have drained most areas that are too wet for cropland. They have also mixed the surface layer with the upper part of the more clayey subsoil on eroded slopes. Lime has been added to maintain near neutral pH in the surface layer.

Information about present soil conditions and landscape plant growing needs can help the user save money by preventing plant losses. The user should also know about possible maintenance costs. Drastically disturbed soils, such as those in areas of the Udorthents, clayey-Urban land complex, undulating, are not considered.

The soil-water-plant relationship is unique to every plant. It is affected by the position of the soil on the landscape, the texture of the surface layer and subsoil, natural drainage, available water capacity, and soil reaction (pH).

Much of the rainwater and snowmelt rapidly runs off the higher and drier parts of the landscape, such as knolls, rises, and slopes, and runs onto the lower and wetter areas, such as flat areas, depressions, drainageways, and flood plains. Some of this surface water on the higher and drier parts of the landscape soaks into the surface layer and subsoil. Some of the water moves less rapidly downslope along the surface layer contact with the subsoil. The rest of the water percolates slowly into the lower part of the subsoil and may eventually enter the subsoil in the lower and wetter areas. Therefore, much more water, along with any dissolved nutrients, is available for plant growth in the lower and wetter areas than in the higher and drier areas. If these lower and wetter areas are not drained or if old drainage systems are not maintained, these areas will be wet for most of the year. Wetland plants are associated with areas that are wet for most of the year. If these areas are drained or if old drainage systems are maintained, upland plants will become more dominant.

Soils in these lower areas are very poorly drained. Drainage systems help to remove excess water. The soils have a very high, high, or moderate available water capacity, and they are generally neutral or slightly acid (pH of 6.1 to 7.3) in the surface layer and subsoil.

Plants likely to grow well on these soils are wetland plants that tolerate ponding or flooding. Edwards muck is neutral or alkaline at a depth of 20 inches. Areas of this soil are difficult to drain and are natural wetlands. Condit, Millgrove, Pewamo, and Sloan soils also support wetland plants in areas that are not drained.

Soils in the higher and drier areas are moderately well drained or well drained. They have a moderate, low, or very low available water capacity and are mostly neutral or acid in the surface layer and in the upper part of the subsoil unless they have been limed.

Plants likely to grow well on these soils are upland tree species and other plants that need about equal parts of air and water in the surface layer and the upper part of the subsoil. Some plants will not tolerate the low amount of air in a clayey subsoil. Other plants will not tolerate the very low available water capacity (droughtiness) in a very gravelly or sandy subsoil. A few plants need very acidic soils, which are not common in the county.

Soils in the higher and drier areas are Amanda, Brecksville, Cardington, Centerburg, Gallman, Glynwood, Heverlo, Latham, Leoni, Loudonville, Lybrand, Martinsville, Mentor, Milton, Pacer, Rarden, and Scioto soils.

Somewhat poorly drained soils in flat areas and on low slopes are too dry in the summer to be considered along with the lower and wetter soils but are too wet in the spring to be considered among the soils in the higher and drier areas. These somewhat poorly drained soils have a low, moderate, or high available water capacity. They are neutral or acid in the surface layer and the upper part of the subsoil unless they have been limed.

Plants likely to grow well on these soils are those that can tolerate both wet and dry conditions in most years, unless the soils are drained.

Soils in these areas are Bennington, Blount, Hyatts, Jimtown, Shoals, Smothers, and Stone soils.

New varieties of some plants can be designed to overcome some plant concerns. For example, Fraser fir, which is grown for Christmas tree production, cannot tolerate the wet, clayey subsoil common to Bennington and Blount soils. A new variety of Fraser fir could grow well in areas of these soils.

Additional information regarding the adaptability of selected plants to the planting site can be obtained from local offices of the Natural Resources Conservation Service, Ohio State University Extension, and the Ohio Department of Natural Resources, Division of Forestry, or from a nursery.

Recreation

The soils of the county are rated in table 12 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites, and either access to public sewer lines or the capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of the height, duration, intensity, and frequency of flooding is essential in planning recreational facilities.

The degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are favorable for the rated use. The limitations are minor and can be easily overcome. Good performance and low maintenance are expected. *Moderate* means that soil properties are moderately favorable for the rated use. The limitations can be overcome or alleviated by planning, design, or maintenance. During some part of the year, the expected performance may be less desirable than that of soils rated *slight*. *Severe* means that soil properties are unfavorable for the rated use. Examples of limitations are slope, bedrock near the surface, flooding, and a seasonal high water table. These limitations generally require major soil reclamation, special design, or intensive maintenance. Overcoming the limitations generally is difficult and costly.

The information in table 12 can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in table 14 and interpretations for septic tank absorption fields in table 15.

Camp areas are tracts of land used intensively as sites for tents, trailers, and campers and for outdoor activities that accompany such sites. These areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The soils are rated on the basis of soil properties that influence the ease of developing camp areas and performance of the areas after development. Also considered are the soil properties that influence trafficability and promote the growth of vegetation after heavy use.

Picnic areas are natural or landscaped tracts of land that are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation after development. The surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Playgrounds are areas used intensively for baseball, football, or similar activities. These areas require a nearly level soil that is free of stones and that can withstand heavy foot traffic and maintain an adequate cover of vegetation. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation. Slope and stoniness are the main concerns in developing playgrounds. The surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Paths and trails are areas used for hiking and horseback riding. The areas should require little or no cutting and filling during site preparation. The soils are rated on the basis of soil properties that influence trafficability and erodibility. Paths and trails should remain firm under foot traffic and not be dusty when dry.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. If food, cover, or water is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area.

If the soils have potential for habitat development, wildlife habitat can be created or improved by planting appropriate vegetation, properly managing the existing plant cover, and fostering the natural establishment of desirable plants.

In table 13, the soils in the county are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are foxtail, goldenrod, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, and shrubs. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include pheasant, meadowlark, field sparrow, killdeer, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of hardwoods or conifers or a mixture of these and associated grasses, legumes, and wild herbaceous plants. The wildlife attracted to this habitat include thrushes, woodpeckers, owls, tree squirrels, porcupine, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas that support water-tolerant plants. The wildlife attracted to this habitat include ducks, geese, herons, rails, kingfishers, and muskrat.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” (USDA, 1999) and “Keys to Soil Taxonomy” (USDA, 1998) and in the “Soil Survey Manual” (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators that can be used to make onsite determinations of hydric soils in this survey area are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

This survey can be used to locate probable areas of hydric soils.

The following map units may meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

CnA	Condit silt loam, 0 to 1 percent slopes
EdA	Edwards muck, 0 to 1 percent slopes
LsA	Lobdell, channery substratum-Sloan, till substratum complex, 0 to 2 percent slopes, occasionally flooded (Sloan component only)
MfA	Millgrove silt loam, 0 to 2 percent slopes
MgA	Millgrove silty clay loam, 0 to 2 percent slopes
MhA	Millgrove silty clay loam, 0 to 2 percent slopes, rarely flooded
PwA	Pewamo silty clay loam, 0 to 1 percent slopes
RsA	Rossburg-Sloan complex, 0 to 2 percent slopes, occasionally flooded (Sloan component only)
SkA	Sloan silt loam, 0 to 2 percent slopes, occasionally flooded
SnA	Sloan silt loam, till substratum, 0 to 2 percent slopes, occasionally flooded
SoA	Sloan silty clay loam, till substratum, 0 to 2 percent slopes, occasionally flooded

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The following map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

BeA	Bennington silt loam, 0 to 2 percent slopes
BeB	Bennington silt loam, 2 to 4 percent slopes
BoA	Blount silt loam, 0 to 2 percent slopes
BoB	Blount silt loam, 2 to 4 percent slopes
CaB	Cardington silt loam, 2 to 6 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes

GbA Gallman silt loam, loamy substratum, 0 to 2 percent slopes
GbB Gallman silt loam, loamy substratum, 2 to 6 percent slopes
GwB Glynwood silt loam, 2 to 6 percent slopes
GwC2 Glynwood silt loam, 6 to 12 percent slopes, eroded
GzC3 Glynwood silty clay loam, 6 to 12 percent slopes, severely eroded
JmA Jimtown silt loam, 0 to 2 percent slopes
LoA Lobdell silt loam, channery substratum, 0 to 2 percent slopes, occasionally flooded
PaA Pacer silt loam, 0 to 2 percent slopes
RoA Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded
SdC2 Scioto silty clay loam, 6 to 12 percent slopes, eroded
SgA Shoals silt loam, 0 to 2 percent slopes, occasionally flooded
SsA Smothers silt loam, 0 to 2 percent slopes
SsB Smothers silt loam, 2 to 4 percent slopes
StA Stone silty clay loam, 0 to 2 percent slopes
SuA Stone clay loam, 0 to 2 percent slopes, rarely flooded
UdB Udorthents, clayey-Urban land complex, undulating

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the “Soil Properties” section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, diversions, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 14 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features generally are favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills generally are limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, potential for frost action, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 15 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted, relatively impervious soil material. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Relatively impervious soil material for the lagoon floor and sides is desirable to minimize seepage and contamination of local ground water.

Table 15 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

A *trench sanitary landfill* is an area where solid waste is disposed of by placing refuse in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil that is excavated from the trench. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. Soil properties that influence the risk of pollution, the ease of excavation, trafficability, and revegetation are the major considerations in rating the soils.

An *area sanitary landfill* is an area where solid waste is disposed of by placing refuse in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil that is imported from a source away from the site. A final cover of soil at least 2 feet thick is placed over the completed landfill. Soil properties that influence trafficability, revegetation, and the risk of pollution are the main considerations in rating the soils for area sanitary landfills.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. The ratings in table 15 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, and soil reaction affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The suitability of a soil for use as cover is based on properties that affect workability and the ease of digging, moving, and spreading the material over the refuse daily during both wet and dry periods.

Soil texture, wetness, rock fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 16 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In the table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 16, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, reaction, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils generally is preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 17 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features generally are favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In table 17, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders or organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table and permeability of the aquifer. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff.

Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. Low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Waste Management

Soil properties and site features are important when organic waste is applied as fertilizer. They also are important when the soil is used as a medium for the treatment and disposal of organic waste. Unfavorable soil properties and site features can result in environmental damage.

The use of organic waste as a production resource results in energy and resource conservation and minimizes the problems associated with waste disposal. If disposal is the goal, applying a maximum amount of the organic waste or the wastewater to a minimal area holds costs to a minimum and environmental damage is the main hazard. If reuse is the goal, a minimum amount should be applied to a maximum area and environmental damage is unlikely.

Specific information regarding waste management is available at the local office of the Natural Resources Conservation Service or Ohio State University Extension.

Table 18 shows the degree and kinds of limitations that affect the land application of manure, food-processing waste, and municipal sewage sludge.

A rating of *slight* indicates that the soils have no limitations or that the limitations can be easily overcome. Good performance and low maintenance can be expected. A rating of *moderate* indicates that the limitations should be recognized but generally can be overcome by good management or special design. A rating of *severe* indicates that overcoming the limitations is difficult or impractical.

The ratings are based on soil properties and site features. Slope affects the ease of application and the potential for surface runoff. Permeability, a high water table, depth to bedrock, and flooding affect absorption of liquid wastes.

Certain factors, such as excessively slow absorption of liquids and excess runoff, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is near the surface, if slope is excessive, or if the water table is near the surface.

Water Quality

Table 19 shows the degree and kinds of soil limitations given for pesticide loss potential resulting from leaching and from surface runoff.

A rating of *slight* indicates that the soils have no limitations or that the limitations can be easily overcome. Good performance and low maintenance can be expected. A rating of *moderate* indicates that the limitations should be recognized but generally can be overcome by good management or special design. A rating of *severe* indicates that overcoming the limitations is difficult or impractical.

Pesticide loss potential from leaching.—Pesticides can be leached through a soil and into the water table before they are taken up by plants or before they are broken down or tied up with organic compounds. Rapid permeability, a high water table, and bedrock near the surface can increase the risk of pesticide loss through leaching. A thicker surface layer and a higher content of organic matter reduce the amount of pesticide lost through leaching.

Pesticide loss potential from surface runoff.—Pesticides can be lost in runoff water, both in solution and adsorbed to sediment suspended in the runoff. Steeper slopes, flooding, and artificial drainage of ponded areas can increase the loss of pesticides resulting from surface runoff.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the county, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

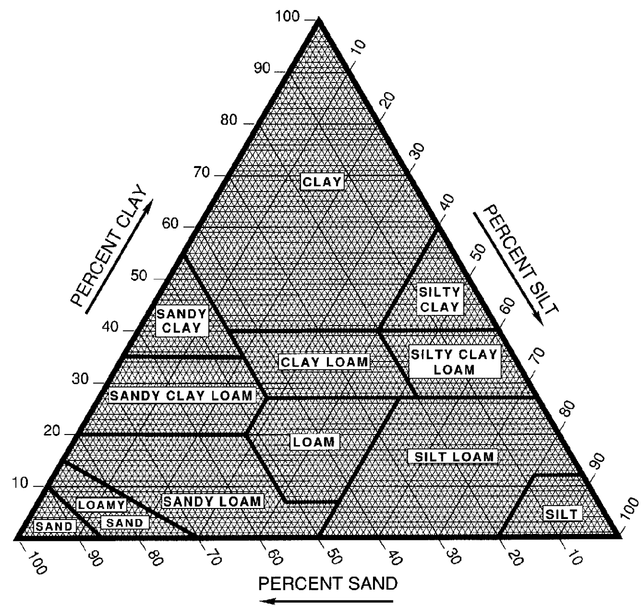

Figure 13.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 20 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the county. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading “Soil Series and Their Morphology.”

Texture is given in the standard terms used by the U.S. Department of Agriculture (fig. 13). These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the county and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the county or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index generally are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Tables 21 and 22 show estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the county. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading “Soil Series and Their Morphology.”

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. The estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrinking and swelling, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $1/3$-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In table 21, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, greater than 9 percent.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 21, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

The *wind erodibility index* is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

In table 22, *cation-exchange capacity* is the total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the soil. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Water Features

Table 23 gives estimates of several important water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low potential for surface runoff) when thoroughly wet. These consist chiefly of very deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have a moderately fine to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils that have a moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high potential for surface runoff) when thoroughly wet. These consist chiefly of clayey soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflow from streams or by runoff from adjacent slopes. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in marshes and swamps or in closed depressions is considered to be ponding.

Table 23 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur. Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. “More than 6.0” indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Ponding is standing water in a closed depression (fig. 14). Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 23 indicates the *maximum ponding depth* and the *duration* of ponding. Maximum ponding depth refers to the depth of the water above the surface of the soil. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days.

Soil Features

Table 24 gives estimates of several important soil features. The estimates are used in land use planning that involves engineering considerations.

Depth to bedrock is given if bedrock is within a depth of 80 inches. The depth is based on many soil borings and on observations during fieldwork. The bedrock is specified as either soft or hard. If the bedrock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the bedrock is hard or massive, blasting or special equipment generally is needed for excavation.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 24 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on

Figure 14.—Ponded surface water in an area of Pewamo silty clay loam, 0 to 1 percent slopes.

thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

A *low* potential for frost action indicates that the soil is rarely susceptible to the formation of ice lenses; a *moderate* potential indicates that the soil is susceptible to formation of ice lenses, resulting in frost heave and the subsequent loss of soil strength; and a *high* potential indicates that the soil is highly susceptible to formation of ice lenses, resulting in frost heave and the subsequent loss of soil strength.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the texture, moisture content, and acidity of the soil.

Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Physical and Chemical Analyses of Selected Soils

Many of the soils in Delaware County were sampled by the Soil Characterization Laboratory, School of Natural Resources, The Ohio State University, Columbus, Ohio. The physical and chemical data obtained from the samples include particle-size distribution, reaction, organic matter content, calcium carbonate content, and extractable cations.

These data were used in classifying and correlating the soils and in evaluating their behavior under various land uses. Seven pedons were selected as representative of their respective series. They are described in the section “Soil Series and Their Morphology.” These series and their laboratory identification numbers are: Cardington, DL-27; Hyatts, DL-54; Lybrand, DL-57; Pacer, DL-56; Scioto, DL-53; Smothers, DL-55; and Stone, DL-59.

In addition to the data from Delaware County, laboratory data are available from nearby counties that include many of the same soils. These data and the data from Delaware County are on file at the School of Natural Resources, The Ohio State University, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 25 shows the classification of the soils in the county. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning from a flood plain, plus *aquent*, the suborder of the Entisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. An example is Aeric Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the county is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the county is described. Pedons used in this publication were primarily described and documented as part of the Delaware County modernization process. In certain circumstances, pedons from adjacent survey areas or from the site of the official series description (OSD) were utilized. In most cases, typical pedons from adjacent survey areas were used to provide consistent supporting data and documentation across survey area boundaries. Pedons from the site of the OSD were used in some cases as part of a nationwide trend in soil survey publications. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (USDA, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (USDA, 1999). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Amanda Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Parent material: Till
Landform: Ground moraines, end moraines
Position on the landform: Backslopes, shoulders
Slope range: 12 to 50 percent
Adjacent soils: Bennington, Cardington, Centerburg, Pewamo, Sloan
Taxonomic classification: Fine-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon

Amanda silt loam, eroded, on a slope of 10 percent; the official soil series description pedon located in Licking County, Ohio; Washington Township; about 1 mile southwest of Utica; 1,950 feet north and 810 feet east of the southwest corner of quarter township 2, T. 4 N., R. 12 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; common fine roots; 10 percent yellowish brown (10YR 5/6), mixed subsoil material; 4 percent rock fragments; moderately acid; abrupt smooth boundary.

Bt1—6 to 14 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; firm; few fine roots; few distinct yellowish brown (10YR 5/4) clay films on faces of peds; common distinct brown (10YR 4/3) coatings along root channels; 5 percent rock fragments; strongly acid; clear smooth boundary.

Bt2—14 to 21 inches; yellowish brown (10YR 5/6) clay loam; moderate fine subangular blocky structure; firm; few fine roots; many distinct yellowish brown (10YR 5/4) clay films on faces of peds; 5 percent rock fragments; very strongly acid; clear smooth boundary.

Bt3—21 to 28 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many faint yellowish brown (10YR 5/6) clay films on faces of peds; few fine yellowish red (5YR 5/8) masses of iron and manganese accumulation; 8 percent rock fragments; strongly acid; clear smooth boundary.

Bt4—28 to 35 inches; yellowish brown (10YR 5/4) clay loam; weak medium subangular blocky structure; firm; few fine roots; many faint pale brown (10YR 6/3) clay films on faces of peds; common medium distinct pale brown (10YR 6/3) iron depletions in the matrix; few fine yellowish red (5YR 5/8) masses of iron and manganese accumulation; 8 percent rock fragments; moderately acid; clear smooth boundary.

BC—35 to 45 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; firm; few medium faint pale brown (10YR 6/3) iron depletions in the matrix; few fine yellowish red (5YR 5/8) masses of iron and manganese accumulation; 8 percent rock fragments; slightly acid; clear wavy boundary.

C—45 to 60 inches; dark yellowish brown (10YR 4/4) loam; massive; firm; 10 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 70 inches
Depth to carbonates: 40 to 70 inches
Depth to bedrock: Greater than 80 inches

A or Ap horizon:
Color—hue of 10YR, value of 3 or 4, chroma of 2 to 4
Texture—silt loam
Content of rock fragments—0 to 5 percent

Bt horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 4 to 6
Texture—silty clay loam, loam, or clay loam
Content of rock fragments—2 to 10 percent

C horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture—loam or silt loam
Content of rock fragments—5 to 10 percent

Bennington Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Till
Landform: Ground moraines, end moraines
Position on the landform: Slight rises, flat areas, knolls, areas of swell-and-swale topography, backslopes
Slope range: 0 to 4 percent
Adjacent soils: Cardington, Centerburg, Amanda, Condit, Pewamo
Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon

Bennington silt loam, 0 to 2 percent slopes, in Berkshire Township; about 0.75 mile west of Berkshire; 80 feet south and 3,660 feet west of the intersection of U. S. Highway 36/Ohio Highway 37 and South Galena Road:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, very pale brown (10YR 7/3) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; few fine and medium roots; 2 percent pebbles; slightly acid; abrupt smooth boundary.

BE—8 to 10 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct grayish brown (10YR 5/2) and light olive brown (2.5Y 5/3) clay depletions on faces of peds and in pores; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; 2 percent pebbles; strongly acid; clear smooth boundary.

Btg—10 to 15 inches; light brownish gray (10YR 6/2) silty clay loam; moderate fine subangular blocky structure; firm; few fine roots; few distinct brown (10YR 5/3) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings in root channels; many medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 2 percent pebbles; strongly acid; gradual wavy boundary.

Bt1—15 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; weak coarse prismatic structure parting to moderate medium angular blocky and moderate fine subangular blocky; firm; few very fine roots; many distinct grayish brown (10YR 5/2) and few distinct light brownish gray (10YR 6/2) clay films on faces of peds; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few medium distinct gray (10YR 6/1) iron depletions in the matrix; few medium distinct black (10YR 2/1) iron and manganese concretions in the matrix; 2 percent pebbles; strongly acid; gradual wavy boundary.

Bt2—23 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; few distinct dark gray (10YR 4/1) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct gray (10YR 6/1) iron depletions in the matrix; 2 percent pebbles; neutral; gradual wavy boundary.

BCt—29 to 54 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium subangular blocky structure; firm; common distinct gray (10YR 6/1) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings in old root channels; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C—54 to 80 inches; brown (10YR 4/3) silty clay loam; massive; firm; few distinct gray (10YR 6/1) carbonate coatings on faces of partings; common medium faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 5 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 28 to 70 inches
Depth to carbonates: 26 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 or 2
Texture—silt loam
Content of rock fragments—0 to 5 percent

Bt horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 to 6
Texture—silty clay loam, clay loam, silty clay, or clay
Content of rock fragments—2 to 5 percent

C horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture—silty clay loam, clay loam, silt loam, or loam
Content of rock fragments—2 to 15 percent

Blount Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow or very slow
Parent material: Till
Landform: Ground moraines, end moraines
Position on the landform: Slight rises, flat areas, knolls, areas of swell-and-swale topography, backslopes

Slope range: 0 to 4 percent
Adjacent soils: Glynwood, Pewamo
Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon

Blount silt loam on a slope of 1 percent; the official soil series description pedon located in Mercer County, Ohio; Washington Township; approximately 1.25 miles east of Wabash; 130 feet west and 1,880 feet south of the northeast corner of sec. 3, T. 6 S., R. 1 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure; friable; common roots; 3 percent pebbles; slightly acid; abrupt smooth boundary.

Btg—7 to 12 inches; grayish brown (10YR 5/2) silty clay; moderate medium subangular structure; firm; common roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct light gray (10YR 7/1) clay depletions on vertical faces of peds; many distinct yellowish brown (10YR 5/4) irregularly shaped masses of iron accumulation with clear boundaries in the matrix; 3 percent pebbles; strongly acid; clear wavy boundary.

Bt—12 to 23 inches; dark yellowish brown (10YR 4/4) clay; weak fine and medium prismatic structure parting to moderate medium subangular blocky; firm; few roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; many faint dark grayish brown (10YR 4/2) irregularly shaped iron depletions with clear boundaries in the matrix; common distinct gray (10YR 5/1) irregularly shaped iron depletions with clear boundaries and yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation with diffuse boundaries in the matrix; 4 percent pebbles; slightly acid; clear wavy boundary.

BCtg—23 to 30 inches; grayish brown (10YR 5/2) silty clay loam; weak medium subangular blocky structure; firm; few faint dark grayish brown (10YR 4/2) clay films on vertical faces of peds; few distinct light gray (10YR 7/2) calcium carbonate coatings on vertical faces of peds; many distinct dark yellowish brown (10YR 4/4) and common distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation with clear boundaries in the matrix; 8 percent pebbles; slightly alkaline; slightly effervescent; clear wavy boundary.

CB—30 to 42 inches; brown (10YR 4/3) clay loam; weak medium platy structure; very firm; common distinct white (10YR 8/1) calcium carbonate coatings on surfaces; common faint dark grayish brown (10YR 5/2) irregularly shaped iron depletions with diffuse boundaries in the matrix; 10 percent pebbles; moderately alkaline; strongly effervescent; gradual wavy boundary.

Cd1—42 to 54 inches; brown (10YR 5/3) clay loam; massive; very firm; common distinct light gray (10YR 7/1) calcium carbonate coatings on surfaces; few distinct dark gray (10YR 4/1) irregularly shaped iron depletions with diffuse boundaries in the matrix; 10 percent pebbles; moderately alkaline; strongly effervescent; gradual wavy boundary.

Cd2—54 to 80 inches; brown (10YR 4/3) clay loam; massive; very firm; 10 percent pebbles; moderately alkaline; strongly effervescent.

Range in Characteristics

Thickness of the solum: 20 to 45 inches
Depth to carbonates: 20 to 40 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 3 or 4, chroma of 1 to 3
Texture—silt loam
Content of rock fragments—0 to 5 percent

Bt and Btg horizons:
Color—hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture—silty clay loam, clay loam, silty clay, or clay
Content of rock fragments—3 to 10 percent

Cd horizon:
Color—hue of 10YR, value of 4 to 6, chroma of 2 to 4
Texture—silty clay loam or clay loam
Content of rock fragments—5 to 15 percent

Brecksville Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Parent material: Residuum derived from shale
Landform: Valley sides of dissected till plains
Position on the landform: Backslopes
Slope range: 25 to 70 percent
Adjacent soils: Gallman, Sloan
Taxonomic classification: Fine-loamy, mixed, mesic Typic Dystrochrepts

Typical Pedon

Brecksville silt loam, in an area of Latham-Brecksville complex, 25 to 70 percent slopes, in Berlin Township; about 2 miles east of Berkshire; 400 feet south and 2,700 feet west of the intersection of North 3 B's and K Road and Heverlo Road:

Oi—0.5 inch to 0; leaf litter.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; strong fine and very fine granular structure; very friable; many medium and common fine roots; 10 percent shale channers; very strongly acid; clear wavy boundary.

BE—3 to 8 inches; yellowish brown (10YR 5/4) very channery silty clay loam; weak fine subangular blocky structure; friable; common fine roots; very few faint brown (10YR 4/3) organic coatings on faces of peds and in pores; 35 percent shale channers; very strongly acid; clear wavy boundary.

Bw—8 to 18 inches; yellowish brown (10YR 5/4) channery silty clay loam; weak fine and medium subangular blocky structure; friable; common fine roots; 30 percent shale channers; very strongly acid; gradual wavy boundary.

C—18 to 22 inches; yellowish brown (10YR 5/4) very channery silty clay loam; massive; friable; few fine roots; 40 percent shale channers; very strongly acid; clear wavy boundary.

Cr—22 to 32 inches; black, soft shale.

Range in Characteristics

Thickness of the solum: 18 to 40 inches
Depth to bedrock: 20 to 40 inches

A horizon:
Color—hue of 10YR, value of 2 to 4, chroma of 1 or 2
Texture—silt loam
Content of rock fragments—0 to 10 percent

Bw horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 or 4
Texture—silty clay loam or channery silty clay loam
Content of rock fragments—0 to 30 percent

C horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture—silty clay loam, channery silty clay loam, or very channery silty clay loam
Content of rock fragments—5 to 40 percent

Cardington Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Parent material: Till
Landform: End moraines, ground moraines
Position on the landform: Summits, shoulders, backslopes
Slope range: 2 to 12 percent
Adjacent soils: Amanda, Bennington, Pewamo
Taxonomic classification: Fine, illitic, mesic Aquic Hapludalfs

Typical Pedon

Cardington silt loam, 2 to 6 percent slopes, in Brown Township; quarter township 4; 1.7 miles southeast of Kilbourne; 9,150 feet south of Kilbourne on Old State Road, then 3,050 feet east; 59 yards south of east-west fence:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; many roots; strongly acid; abrupt smooth boundary.

B/E—8 to 12 inches; 86 percent yellowish brown (10YR 5/4) silty clay loam (B); moderate medium subangular blocky structure; firm; few roots; 14 percent dark grayish brown (10YR 4/2) silt loam (E); the E material is in many distinct clay depletions on faces of peds and in pores; very strongly acid; gradual smooth boundary.

Bt1—12 to 20 inches; yellowish brown (10YR 5/4) silty clay loam; strong medium subangular blocky structure; firm; few roots; few faint brown (10YR 4/3) clay films on faces of peds; common fine prominent grayish brown (2.5Y 5/2) iron depletions in the matrix; very strongly acid; gradual smooth boundary.

Bt2—20 to 27 inches; dark yellowish brown (10YR 4/4) clay loam; strong medium subangular blocky structure; firm; many faint brown (10YR 4/3) clay films on faces of peds; common medium prominent grayish brown (2.5Y 5/2) iron depletions in the matrix; 2 percent rock fragments; strongly acid; gradual smooth boundary.

Bt3—27 to 32 inches; brown (10YR 4/3) clay loam; moderate medium subangular blocky structure; firm; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few dark masses of iron and manganese accumulation; few medium faint grayish brown (10YR 5/2) iron depletions in the matrix; 2 percent rock fragments; moderately acid; gradual wavy boundary.

BC—32 to 38 inches; brown (10YR 4/3) clay loam; weak medium subangular blocky structure; firm; few faint films on vertical faces of peds; common medium distinct dark grayish brown (2.5Y 4/2) iron depletions in the matrix; 5 percent rock fragments; slightly effervescent; slightly alkaline; gradual wavy boundary.

C—38 to 60 inches; brown (10YR 4/3) clay loam; massive; firm; 5 percent rock fragments; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 28 to 50 inches
Depth to carbonates: 26 to 45 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—0 to 5 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 to 6
Texture—silty clay loam, clay loam, silty clay, or clay
Content of rock fragments—0 to 15 percent

C horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 4
Texture—silty clay loam, clay loam, silt loam, or loam
Content of rock fragments—2 to 15 percent

Centerburg Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately slow
Parent material: Till
Landform: End moraines, ground moraines
Position on the landform: Summits, shoulders, backslopes
Slope range: 2 to 12 percent
Adjacent soils: Amanda, Bennington, Pewamo
Taxonomic classification: Fine-loamy, mixed, mesic Aquic Hapludalfs

Typical Pedon

Centerburg silt loam on a slope of 3 percent; the official soil series description pedon located in Licking County, Ohio; St. Albans Township; about 1 mile north of Alexandria; 1,890 yards south and 1,370 yards east of the northwest corner of quarter township 1, T. 2 N., R. 14 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium granular structure; very friable; common fine roots; 2 percent pebbles; moderately acid; abrupt smooth boundary.

Bt1—7 to 12 inches; yellowish brown (10YR 5/4) silt loam; moderate fine subangular blocky structure; friable; few fine roots; few faint brown (10YR 5/3) clay films on faces of peds; 2 percent pebbles; strongly acid; abrupt wavy boundary.

Bt2—12 to 16 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium angular blocky structure; firm; few fine roots; common distinct yellowish brown (10YR 5/4) clay films on faces of peds; 4 percent pebbles; very strongly acid; clear wavy boundary.

Bt3—16 to 23 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many faint yellowish brown (10YR 5/4) clay films on faces of peds; common faint brown (10YR 5/3) clay depletions on faces of peds; common fine distinct grayish brown (10YR 5/2) irregularly shaped iron depletions and yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; 3 percent pebbles; very strongly acid; clear wavy boundary.

Bt4—23 to 29 inches; dark yellowish brown (10YR 4/4) clay loam; moderate coarse subangular blocky structure; firm; few fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) irregularly shaped iron depletions and yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; 3 percent pebbles; moderately acid; gradual wavy boundary.

BCt—29 to 35 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse subangular blocky structure; firm; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) irregularly shaped iron depletions and yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of iron and manganese accumulation throughout; 2 percent pebbles; slightly alkaline; clear wavy boundary.

C1—35 to 40 inches; brown (10YR 4/3) loam; massive; firm; common fine and medium faint grayish brown (10YR 5/2) irregularly shaped iron depletions and distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; few fine prominent white (10YR 8/2) weathered limestone fragments; 8 percent pebbles; slightly effervescent; moderately alkaline; gradual wavy boundary.

C2—40 to 60 inches; brown (10YR 4/3) loam; massive; firm; common medium distinct gray (10YR 5/1) and faint grayish brown (10YR 5/2) irregularly shaped iron depletions and distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; 8 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 30 to 54 inches
Depth to carbonates: 30 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture—silt loam
Content of rock fragments—0 to 10 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 to 6
Texture—silty clay loam, clay loam, silt loam, or loam
Content of rock fragments—0 to 15 percent

C horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 4
Texture—loam or silt loam
Content of rock fragments—3 to 15 percent

Condit Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Slow
Parent material: Till
Landform: Ground moraines
Position on the landform: Closed depressions
Slope range: 0 to 1 percent
Adjacent soils: Cardington, Centerburg, Bennington, Pewamo
Taxonomic classification: Fine, illitic, mesic Typic Epiaqualfs

Typical Pedon

Condit silt loam, 0 to 1 percent slopes, in Kingston Township; about 2.5 miles northwest of Olive Green; 720 feet south and 1,650 feet west of the intersection of Kilbourne Road and Blue Church Road:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; common very fine roots; 10 percent intermixing of grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) material from the Btg1 horizon; very strongly acid; abrupt smooth boundary.

Btg1—10 to 16 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm; very few very fine roots; few faint gray (10YR 5/1) clay films on faces of peds and in pores; many medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few medium distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation in the matrix; very strongly acid; clear smooth boundary.

Btg2—16 to 32 inches; grayish brown (10YR 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; very few very fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds and in pores; common faint gray (10YR 5/1) clay depletions on faces of peds and in pores; many medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; few medium distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation in the matrix; 2 percent pebbles; strongly acid; gradual wavy boundary.

Bt1—32 to 50 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; very few very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds and in pores; few distinct gray (10YR 5/1) clay depletions on faces of peds and in pores; common medium faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation in the matrix; 2 percent pebbles; strongly acid; gradual wavy boundary.

Bt2—50 to 70 inches; brown (10YR 4/3) silty clay loam; moderate medium and coarse subangular blocky structure; firm; very few very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds and in pores; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few prominent very dark gray (N 3/0) masses of iron and manganese accumulation in old root channels; 2 percent pebbles; moderately acid in the upper part grading to neutral in the lower part; gradual wavy boundary.

C—70 to 80 inches; brown (10YR 4/3) silty clay loam; massive; firm; few prominent gray (N 5/0) iron depletions surrounding old root channels; few medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 5 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 38 to 75 inches
Depth to carbonates: 38 to 75 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 1 or 2
Texture—silt loam
Content of rock fragments—0 to 3 percent

Btg horizon:
Color—hue of 10YR, 2.5Y, 5Y, or N, value of 4 or 5, chroma of 0 to 2
Texture—silty clay loam or clay loam; thin subhorizons of silty clay in some pedons
Content of rock fragments—0 to 10 percent

Bt horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 to 6
Texture—silty clay loam or clay loam; thin subhorizons of silty clay in some pedons
Content of rock fragments—0 to 10 percent

C horizon:
Color—value of 4 or 5, chroma of 3 or 4
Texture—silty clay loam or clay loam
Content of rock fragments—1 to 10 percent

Edwards Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow to moderately rapid in the organic material; moderately slow or slow in the marl
Parent material: Organic deposits overlying marl
Landform: Outwash plains
Position on the landform: Depressions
Slope range: 0 to 2 percent
Adjacent soils: Stone, Pewamo, Millgrove
Taxonomic classification: Marly, euic, mesic Limnic Medisaprists

Typical Pedon

Edwards muck on a slope of 1 percent; the official soil series description pedon located in Washtenaw County, Michigan; about 7 miles south of the town of Chelsea; 1,805 feet south and 420 feet east of the northwest corner of sec. 18, T. 3 S., R. 4 E.

Oa1—0 to 9 inches; muck, black (10YR 2/1) broken face and rubbed; about 5 percent fiber before and after rubbing; moderate fine granular structure; friable; sodium pyrophosphate very dark grayish brown (10YR 3/2); herbaceous fibers; slightly alkaline; abrupt smooth boundary.

Oa2—9 to 15 inches; muck, black (10YR 2/1) broken face, very dark brown (10YR 2/2) rubbed; about 10 percent fiber, less than 5 percent rubbed; weak thick platy structure; friable; sodium pyrophosphate very dark grayish brown (10YR 3/2); herbaceous fibers; slightly alkaline; clear smooth boundary.

Oa3—15 to 32 inches; muck, black (10YR 2/1) broken face and rubbed; about 15 percent fiber, 5 percent rubbed; weak thick platy structure; friable; sodium pyrophosphate very dark grayish brown (10YR 3/2); herbaceous fibers; slightly alkaline; clear smooth boundary.

Lma—32 to 60 inches; light gray (10YR 7/1) marl; massive; friable; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the organic deposit: 16 to 24 inches
Depth to bedrock: More than 80 inches

Oa horizon:
Color—hue of 10YR or N, value of 2, chroma of 0 to 2
Texture—sapric material

Lma horizon:
Color—hue of 10YR to 5Y, value of 4 to 8, chroma of 1 or 2
Texture—marl

Gallman Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Parent material: Outwash; outwash overlying till in the till substratum phase
Landform: Outwash terraces, kames, end moraines
Position on the landform: Flat areas, summits, shoulders, backslopes, knolls
Slope range: 0 to 12 percent

Adjacent soils: Amanda, Centerburg, Glynwood, Lobdell, Millgrove, Sloan
Taxonomic classification: Fine-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon

Gallman silt loam, loamy substratum, 2 to 6 percent slopes, in Orange Township; about 3 miles south of Africa; 1,790 feet north and 2,940 feet west of the intersection of Africa Road and Moss Road:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; weak coarse subangular blocky structure parting to weak fine and medium granular; firm; few fine and very fine roots; 10 percent pebbles; strongly acid; abrupt smooth boundary.

AB—9 to 16 inches; dark yellowish brown (10YR 4/4) loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in pores; 5 percent pebbles; strongly acid; clear smooth boundary.

Bt1—16 to 24 inches; brown (7.5YR 4/4) gravelly clay loam; moderate medium subangular blocky structure; firm; few fine roots; many faint brown (7.5YR 4/4) clay films on faces of peds; many distinct brown (10YR 4/3) organic coatings on faces of peds; 25 percent pebbles, mostly shale; moderately acid; gradual smooth boundary.

Bt2—24 to 34 inches; brown (7.5YR 4/4) very gravelly clay loam; moderate medium subangular blocky structure; firm; many distinct brown (7.5YR 4/2) clay films on faces of peds; 35 percent pebbles, mostly shale; moderately acid; clear smooth boundary.

Bt3—34 to 44 inches; brown (7.5YR 4/4) very gravelly clay loam; weak coarse subangular blocky structure; firm; many distinct brown (7.5YR 4/2) clay films on faces of peds; 35 percent pebbles, mostly shale; moderately acid; clear wavy boundary.

Bt4—44 to 50 inches; brown (7.5YR 4/4) gravelly clay loam; weak coarse subangular blocky structure; firm; many distinct brown (7.5YR 4/2) clay films on faces of peds; 25 percent pebbles; moderately acid; clear irregular boundary.

Bt5—50 to 73 inches; brown (7.5YR 4/2) sandy clay loam; weak coarse subangular blocky structure; friable; common faint dark brown (7.5YR 3/2) clay films between sand grains; 2 percent pebbles; slightly acid; clear irregular boundary.

C—73 to 80 inches; 70 percent dark grayish brown (10YR 4/2) and 30 percent light yellowish brown (10YR 6/4) loam; single grain; loose; 2 percent pebbles; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 55 to 120 inches
Depth to till: Greater than 80 inches; 60 to 80 inches in the till substratum phase
Depth to carbonates: 50 to 120 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture—silt loam or loam
Content of rock fragments—0 to 10 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 3 to 5, chroma of 2 to 4
Texture—clay loam, loam, sandy clay loam, or the gravelly or very gravelly analogs of these textures
Content of rock fragments—5 to 30 percent in the upper part and 2 to 40 percent in the lower part

C horizon:
Color—hue of 10YR or 7.5YR, value of 4 to 6, chroma of 2 to 4
Texture—loam or sandy loam with strata of loamy sand or sand, or the gravelly or very gravelly analogs of these textures
Content of rock fragments—2 to 40 percent

2C horizon (till substratum):
Color—hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture—silty clay loam
Content of rock fragments—2 to 15 percent

Glynwood Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow or very slow
Parent material: Till
Landform: Ground moraines, end moraines
Position on the landform: Summits, shoulders, backslopes
Slope range: 2 to 12 percent
Adjacent soils: Blount, Lybrand, Milton, Pewamo
Taxonomic classification: Fine, illitic, mesic Aquic Hapludalfs

Typical Pedon

Glynwood silt loam, 2 to 6 percent slopes, in Scioto Township; about 1 mile southeast of Ostrander; 690

feet south and 510 feet west of the intersection of Calhoun Road and Newhouse Road:

Ap—0 to 8 inches; brown (10YR 5/3) silt loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; many fine roots; moderately acid; clear smooth boundary.

Bt1—8 to 12 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common faint yellowish brown (10YR 5/4) clay films on faces of peds; common faint brown (10YR 5/3) organic coatings on faces of peds; 2 percent pebbles; very strongly acid; clear wavy boundary.

Bt2—12 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium prismatic structure parting to strong medium angular blocky; firm; few fine roots; common faint dark yellowish brown (10YR 4/4) and few distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; common fine distinct gray (10YR 6/1) irregularly shaped iron depletions in the matrix; 2 percent pebbles; moderately acid; clear smooth boundary.

Bt3—25 to 33 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium platy structure parting to weak medium subangular blocky; firm; few fine roots; few faint brown (10YR 5/3) and few distinct grayish brown (10YR 5/2) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation on faces of peds; few fine distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; 5 percent pebbles; strongly effervescent; moderately alkaline; gradual smooth boundary.

Cd—33 to 80 inches; yellowish brown (10YR 5/4) silty clay loam; massive; very firm; few fine roots; few distinct light gray (10YR 6/1) carbonate coatings on faces of partings; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation on faces of partings; 10 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 25 to 40 inches
Depth to carbonates: 16 to 36 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture—silt loam or silty clay loam
Content of rock fragments—0 to 5 percent

Bt horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 to 6
Texture—silty clay, clay, silty clay loam, or clay loam
Content of rock fragments—0 to 10 percent

Cd horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 to 6
Texture—silty clay loam or clay loam
Content of rock fragments—2 to 15 percent

Heverlo Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Outwash overlying shale
Landform: Valley sides on till plains
Position on the landform: Backslopes and shoulders
Slope range: 25 to 70 percent
Adjacent soils: Gallman, Lobdell
Taxonomic classification: Fine, mixed, mesic Typic Hapludalfs

Typical Pedon

Heverlo silt loam, 25 to 70 percent slopes; the official soil series description pedon located in Morrow County, Ohio; Peru Township; about 1 mile southwest of West Liberty; 1,050 feet northeast of the intersection of County Road 24 and County Road 15, along County Road 24, then 900 feet east:

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; strong fine and medium granular structure; friable; few coarse and common fine and medium roots; few fine tubular and vesicular pores; 5 percent pebbles; slightly alkaline; clear smooth boundary.

AE—4 to 9 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few coarse and common fine and medium roots; few fine tubular and vesicular pores; 5 percent pebbles; slightly alkaline; clear smooth boundary.

BE—9 to 14 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; few coarse and common fine and medium roots; many fine vesicular and few medium tubular pores; dark grayish brown (10YR 4/2) krotovinas; tonguing of dark yellowish brown (10YR 4/4) material; 10 percent pebbles; neutral; clear smooth boundary.

Bt1—14 to 20 inches; yellowish brown (10YR 5/6) gravelly clay loam; weak medium subangular blocky structure; firm; few coarse, medium, and fine roots; common fine vesicular and few fine and medium tubular pores; common distinct yellowish brown (10YR 5/4) clay films on faces of peds; few fine distinct reddish yellow (7.5YR 6/8) masses of iron accumulation in the matrix; 15 percent pebbles; neutral; clear smooth boundary.

Bt2—20 to 33 inches; yellowish brown (10YR 5/6) gravelly clay loam; strong fine and medium subangular blocky structure; firm; few fine and medium roots; common fine vesicular and few fine tubular pores; many distinct yellowish brown (10YR 5/4) clay films on faces of peds; few fine faint strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 30 percent rock fragments; slightly acid; clear smooth boundary.

2Cr—33 to 43 inches; variegated very dark brown (10YR 2/2), black (10YR 2/1), and dark gray (10YR 4/1), highly fractured shale; can be cut with a spade.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

A horizon:
Color—hue of 10YR, value of 3 or 4, chroma of 2 to 4
Texture—silt loam
Content of rock fragments—0 to 10 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 4 to 6
Texture—silty clay loam, clay loam, clay, or the gravelly or channery analogs of these textures
Content of rock fragments—5 to 35 percent

Hyatts Series

Depth class: Deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Till and the underlying residuum derived from shale
Landform: Ground moraines
Position on the landform: Flat areas, areas of swell-and-swale topography, knolls, backslopes
Slope range: 0 to 4 percent
Adjacent soils: Loudonville, Pewamo, Rarden, Smothers
Taxonomic classification: Fine, mixed, mesic Aeric Epiaqualfs

Typical Pedon

Hyatts silt loam, 0 to 2 percent slopes, in Genoa Township; about 2 miles southwest of Harlem; 1,340 feet north and 2,530 feet west of the intersection of Smothers Road and Red Bank Road:

Ap—0 to 11 inches; grayish brown (10YR 5/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure; friable; many very fine and medium roots; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix and in pores; few medium distinct very dark grayish brown (10YR 3/2) iron and manganese nodules with diffuse boundaries in the matrix; 1 percent pebbles; strongly acid; abrupt smooth boundary.

Bt1—11 to 16 inches; yellowish brown (10YR 5/6) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine and very fine roots; few distinct brown (10YR 5/3) clay films on faces of peds; many distinct grayish brown (10YR 5/2) clay depletions on faces of peds and in pores; few medium distinct strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; many medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct very dark grayish brown (10YR 3/2) iron and manganese nodules with diffuse boundaries in the matrix; 1 percent pebbles; strongly acid; clear smooth boundary.

Bt2—16 to 31 inches; strong brown (7.5YR 5/6) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; many prominent dark grayish brown (10YR 4/2) clay films on faces of peds and in pores; common prominent grayish brown (10YR 5/2) clay depletions on faces of peds; common medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; 1 percent pebbles; strongly acid in the upper part grading to neutral in the lower part; clear wavy boundary.

Bt3—31 to 35 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak coarse subangular blocky structure; firm; few fine roots; common faint dark yellowish brown (10YR 4/4) and common distinct grayish brown (10YR 5/2) clay films on faces of peds; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; 1 percent pebbles; 10 percent soft limestone and shale fragments; slightly alkaline; clear wavy boundary.

2Btk—35 to 46 inches; silty clay with a variegated color pattern consisting of 40 percent yellowish brown (10YR 5/6), 40 percent grayish brown (10YR 5/2), and 20 percent yellowish red (5YR 5/6); weak coarse prismatic structure; firm; few fine roots; many distinct gray (N 6/0) clay films on faces of peds; common prominent white (N 8/0) carbonate coatings on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings in old root channels that are 5 to 10 mm thick; 10 percent pararock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

2Crk—46 to 56 inches; soft shale, 50 percent yellowish brown (10YR 5/6) and 50 percent grayish brown (10YR 5/2); many prominent white (N 8/0) carbonate coatings in horizontal fractures.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 26 to 50 inches
Depth to bedrock: 40 to 60 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—0 to 5 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 2 to 6
Texture—silty clay loam or silty clay
Content of rock fragments—0 to 10 percent

2Bt horizon:
Color—hue of 5YR to 2.5Y, value of 4 to 6, chroma of 1 to 6
Texture—silty clay loam, silty clay, or the channery analogs of these textures
Content of rock fragments—0 to 25 percent

Jimtown Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Outwash
Landform: Outwash terraces
Position on the landform: Flat areas
Slope range: 0 to 2 percent
Adjacent soils: Bennington, Cardington, Centerburg, Gallman, Millgrove, Sloan

Taxonomic classification: Fine-loamy, mixed, mesic Aeric Endoaqualfs

Typical Pedon

Jimtown silt loam, 0 to 2 percent slopes, in Knox County, Ohio; Brown Township; about 3 miles south of Jelloway; 1,750 feet west along Orange Hill Road from the intersection of Orange Hill Road and Ohio Highway 205, then 1,300 feet north:

Ap—0 to 12 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; 5 percent pebbles; neutral; abrupt smooth boundary.

BE—12 to 15 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; common distinct light brownish gray (10YR 6/2) clay depletions on faces of peds; many coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; few pebbles; strongly acid; clear wavy boundary.

Bt1—15 to 22 inches; yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; friable; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common distinct light brownish gray (10YR 6/2) clay depletions on faces of peds; common coarse prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; many coarse distinct gray (10YR 5/1) iron depletions in the matrix; 5 percent pebbles; moderately acid; diffuse wavy boundary.

Bt2—22 to 32 inches; yellowish brown (10YR 5/4) very gravelly loam; weak fine subangular blocky structure; friable; few thin strata of sandy loam; many distinct grayish brown (10YR 5/2) coatings on faces of peds; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few faint brown (10YR 5/3) clay bridges between pebbles; many prominent strong brown (7.5YR 5/8) stains on pebbles; few medium distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; 40 percent pebbles; pebble line along the lower boundary; moderately acid; clear wavy boundary.

Bt3—32 to 39 inches; yellowish brown (10YR 5/4) very gravelly loam; weak medium subangular blocky structure; very friable; many distinct grayish brown (10YR 5/2) coatings on faces of peds; many faint brown (10YR 5/3) clay films on pebbles and clay bridges between pebbles; common prominent strong brown (7.5YR 5/8) stains on pebbles; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; 40 percent pebbles; strongly acid; clear wavy boundary.

Bt4—39 to 46 inches; dark yellowish brown (10YR 4/4) very gravelly loam; massive; friable; thin strata of very gravelly clay loam; many faint dark yellowish brown (10YR 4/4) clay films on pebbles and clay bridges between pebbles; few prominent strong brown (7.5YR 5/6) stains on pebbles; 45 percent pebbles; slightly acid; clear wavy boundary.

C—46 to 60 inches; yellowish brown (10YR 5/6) very gravelly loam; massive; friable; many prominent strong brown (7.5YR 5/8) stains on pebbles; 35 percent pebbles; slightly acid.

Range in Characteristics

Thickness of the solum: 36 to 48 inches
Depth to carbonates: Greater than 48 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 4, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—0 to 5 percent

Bt and Btg horizons:
Color—hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture—loam, clay loam, silt loam, sandy loam, or the gravelly analogs of these textures
Content of rock fragments—0 to 30 percent

C horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture—loam, clay loam, sandy loam, or the gravelly or very gravelly analogs of these textures
Content of rock fragments—5 to 60 percent

Latham Series

Depth class: Moderately deep
Drainage class: Moderately well drained
Permeability: Slow
Parent material: Residuum derived from shale
Landform: Dissected areas on till plains
Position on the landform: Shoulders
Slope range: 25 to 70 percent
Adjacent soils: Amanda, Bennington, Cardington
Taxonomic classification: Clayey, mixed, mesic Aquic Hapludults

Typical Pedon

Latham silt loam, in an area of Latham-Brecksville complex, 25 to 70 percent slopes, in Berlin Township; about 2 miles east of Berkshire; 120 feet south and 2,670 feet west of the intersection of North 3 B's and K Road and Heverlo Road:

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure; friable; many fine and medium roots; 2 percent shale channers; very strongly acid; clear smooth boundary.

BE—3 to 11 inches; brown (10YR 5/3) silty clay loam; moderate medium and coarse subangular blocky structure; friable; few fine and medium roots; 5 percent shale channers; very strongly acid; gradual wavy boundary.

Bt1—11 to 18 inches; brown (10YR 5/3) silty clay loam; strong medium subangular blocky structure; firm; few fine and medium roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/6) irregularly shaped masses of iron accumulation in the matrix; few fine distinct gray (10YR 6/1) irregularly shaped iron depletions in the matrix; 5 percent shale channers; very strongly acid; gradual smooth boundary.

Bt2—18 to 21 inches; silty clay with a variegated color pattern consisting of 50 percent yellowish brown (10YR 5/4) and 50 percent reddish brown (5YR 4/4); strong fine and medium subangular blocky structure; firm; few fine and medium roots; common faint dark yellowish brown (10YR 4/4) and few prominent gray (N 6/0) clay films on faces of peds; common distinct grayish brown (10YR 5/2) clay depletions on faces of peds; 5 percent shale channers; very strongly acid; clear wavy boundary.

C—21 to 30 inches; yellowish brown (10YR 5/4) channery silty clay loam; massive; firm; few fine roots; few fine distinct light brownish gray (10YR 6/2) iron depletions on rock fragments and on faces of partings; 25 percent shale channers; 25 percent soft shale fragments; very strongly acid; clear irregular boundary.

Cr—30 to 40 inches; black, soft shale.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

A horizon:
Color—hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—0 to 15 percent

Bt horizon:
Color—hue of 2.5Y, 10YR, 7.5YR, or 5YR, value of 4 to 6, chroma of 2 to 8
Texture—silty clay loam, silty clay, or the channery analogs of these textures
Content of rock fragments—0 to 20 percent

C horizon:
Color—hue of 2.5Y or 10YR, value of 5 or 6, chroma of 2 to 6
Texture—silty clay loam, silty clay, or the channery analogs of these textures
Content of rock fragments—0 to 30 percent

Leoni Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate or moderately rapid in the subsoil; moderately rapid or rapid in the substratum
Parent material: Outwash
Landform: Eskers, kames
Position on the landform: Backslopes, shoulders
Slope range: 12 to 25 percent
Adjacent soils: Pewamo, Scioto, Stone
Taxonomic classification: Loamy-skeletal, mixed, mesic Typic Hapludalfs

Typical Pedon

Leoni gravelly sandy loam, on a slope of 4 percent; the official soil series description pedon located in Jackson County, Michigan; about 1.5 miles north of Jackson; 460 feet south and 2,240 feet east of the northwest corner of sec. 23, T. 2 S., R. 1 W.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; 20 percent pebbles; moderately acid; abrupt smooth boundary.
BE—11 to 13 inches; brown (7.5YR 4/4) gravelly sandy loam; moderate medium subangular blocky structure; friable; 25 percent pebbles; neutral; clear wavy boundary.
Bt1—13 to 18 inches; brown (7.5YR 4/4) very gravelly sandy clay loam; moderate medium subangular blocky structure; firm; thin clay films on faces of peds and on pebbles; 35 percent pebbles; 3 percent cobbles; slightly acid; gradual wavy boundary.
Bt2—18 to 29 inches; brown (7.5YR 4/4) very gravelly sandy loam; moderate medium subangular blocky structure; firm; thin clay films on faces of peds and on pebbles; 30 percent pebbles; 10 percent cobbles; neutral; clear wavy boundary.
BC—29 to 42 inches; brown (7.5YR 4/4) very gravelly sandy loam; weak medium subangular blocky structure; friable; 35 percent pebbles; 3 percent cobbles; neutral; abrupt irregular boundary.
C—42 to 60 inches; dark yellowish brown (10YR 4/4) extremely gravelly loamy sand; single grain; loose; 75 percent pebbles; 5 percent cobbles; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 35 to 60 inches
Depth to carbonates: 0 to 24 inches
Depth to bedrock: Greater than 80 inches

A or Ap horizon:
Color—hue of 10YR, value of 3, chroma of 2 or 3
Texture—gravelly loam or very gravelly loam
Content of rock fragments—15 to 40 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 3 to 5, chroma of 4 to 6
Texture—the very gravelly or extremely gravelly analogs of loam, clay loam, sandy loam, or sandy clay loam
Content of rock fragments—35 to 65 percent

C horizon:
Color—hue of 10YR, value of 4 to 6, chroma of 2 to 4
Texture—sandy loam, loamy sand, or the gravelly, cobbly, very gravelly, or very cobbly analogs of these textures
Content of rock fragments—10 to 40 percent

Lobdell Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Alluvium
Landform: Flood plains, natural levees on flood plains
Position on the landform: Flat areas, slightly higher areas adjacent to the stream channel
Slope range: 0 to 2 percent
Adjacent soils: Amanda, Gallman, Sloan
Taxonomic classification: Fine-loamy, mixed, mesic Fluvaquentic Eutrochrepts

Typical Pedon

Lobdell silt loam, channery substratum, 0 to 2 percent slopes, occasionally flooded, in Trenton Township;

about 2 miles north-northeast of Sunbury; 2,715 feet south and 3,720 feet east of the intersection of Ohio Highway 61 and Stockwell Road:

Ap—0 to 9 inches; silt loam, dark brown (10YR 3/3) broken, brown (10YR 4/3) rubbed, light brownish gray (10YR 6/2) dry; moderate medium granular structure from 0 to 4 inches; weak medium subangular blocky structure parting to weak fine granular from 4 to 9 inches; friable; many fine and few medium roots; 1 percent pebbles; neutral; clear smooth boundary.

Bw1—9 to 18 inches; dark yellowish brown (10YR 4/4) loam; moderate medium subangular blocky structure; friable; few fine and very fine roots; many faint dark brown (10YR 3/3) organic coatings on faces of peds and in root channels; few medium distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; 2 percent pebbles; neutral; gradual wavy boundary.

Bw2—18 to 25 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; friable; few fine roots; common faint dark brown (10YR 3/3) organic coatings on faces of peds; few distinct black (10YR 2/1) masses of iron and manganese accumulation on faces of peds; common medium distinct grayish brown (10YR 5/2) irregularly shaped iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix and in worm channels and root channels; 2 percent pebbles; neutral; gradual wavy boundary.

Bw3—25 to 36 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; friable; few fine roots; common faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; few prominent brown (7.5YR 4/4) masses of iron and manganese accumulation in root channels and in pores; many medium faint yellowish brown (10YR 5/4) irregularly shaped masses of iron accumulation in the matrix; common medium faint grayish brown (10YR 5/2) irregularly shaped iron depletions in the matrix; 2 percent pebbles; neutral; gradual wavy boundary.

C1—36 to 44 inches; brown (10YR 5/3) loam; massive; friable; common prominent brown (7.5YR 4/4) and common faint very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation in root channels and in pores; many medium faint yellowish brown (10YR 5/4) irregularly shaped masses of iron accumulation in the matrix; common medium faint grayish brown (10YR 5/2) and gray (10YR 6/1) irregularly shaped iron depletions in the matrix; 10 percent pebbles; neutral; clear wavy boundary.

C2—44 to 48 inches; brown (10YR 5/3) loam and clay loam; massive; friable; common medium prominent strong brown (7.5YR 5/8) irregularly shaped masses of iron accumulation in the matrix; many medium faint grayish brown (10YR 5/2) and many medium distinct gray (10YR 5/1) irregularly shaped iron depletions in the matrix; 2 percent pebbles; neutral; clear wavy boundary.

2C3—48 to 65 inches; brown (10YR 5/3) very channery loam and very channery clay loam; massive; friable; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium faint grayish brown (10YR 5/2) and many medium distinct gray (10YR 5/1) irregularly shaped iron depletions in the matrix; 30 percent channers; 20 percent pebbles; neutral.

Range in Characteristics

Thickness of the solum: 24 to 50 inches
Depth to bedrock: Greater than 80 inches

Ap or A horizon:
Color—hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—0 to 5 percent

Bw horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 or 4
Texture—silt loam, loam, clay loam, or sandy loam
Content of rock fragments—0 to 15 percent

C horizon:
Color—hue of 10YR, 7.5YR, or 2.5Y, value of 4 to 6, chroma of 1 to 8
Texture—silt loam, loam, sandy clay loam, or clay loam
Content of rock fragments—0 to 15 percent

2C horizon:
Color—hue of 10YR, 7.5YR, or 2.5Y, value of 4 to 6, chroma of 1 to 6
Texture—the channery or very channery analogs of loam, clay loam, or sandy loam
Content of rock fragments—15 to 50 percent

Loudonville Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Till overlying sandstone

Landform: Ground moraines
Position on the landform: Summits
Slope range: 2 to 6 percent
Adjacent soils: Bennington, Brecksville, Centerburg, Latham, Smothers
Taxonomic classification: Fine-loamy, mixed, mesic Ultic Hapludalfs
Taxadjunct features: The Loudonville soils in Delaware County have lower base saturation above the lithic contact than is defined as the range for the series. They are classified as fine-loamy, mixed, mesic Typic Hapludults. This difference does not significantly affect the use or management of the soils.

Typical Pedon

Loudonville silt loam, 2 to 6 percent slopes, in Harlem Township; about 0.75 mile southwest of Harlem; 2,590 feet south and 2,480 feet east of the intersection of Gorsuch Road and Red Bank Road:

Ap—0 to 12 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure parting to moderate fine granular; friable; many fine and very fine roots; 2 percent pebbles; strongly acid; abrupt smooth boundary.
Bt1—12 to 19 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; 2 percent pebbles; strongly acid; gradual smooth boundary.
Bt2—19 to 33 inches; yellowish brown (10YR 5/4) silty clay loam; strong medium subangular blocky structure; firm; few fine and very fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few medium distinct grayish brown (10YR 5/2) relict mottles in the matrix; 5 percent pebbles; very strongly acid; abrupt smooth boundary.
2R—33 to 34 inches; grayish brown (2.5Y 5/2), hard, fine grained sandstone.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

Ap horizon:
Color—hue of 10YR, value of 4, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—0 to 5 percent

Bt horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 4 to 6
Texture—silt loam, silty clay loam, clay loam, or the channery analogs of these textures
Content of rock fragments—2 to 25 percent

Lybrand Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow or very slow
Parent material: Till
Landform: Dissected ground moraines and end moraines
Position on the landform: Shoulders, backslopes, dissected areas along streams
Slope range: 12 to 25 percent
Adjacent soils: Glynwood, Blount, Scioto
Taxonomic classification: Fine, illitic, mesic Typic Hapludalfs

Typical Pedon

Lybrand silt loam, 12 to 18 percent slopes, eroded, in Scioto Township; about 6 miles west of Delaware; 550 feet north and 1,000 feet west of the intersection of U.S. Highway 36 and Ohio Highway 257:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; moderate medium granular structure; friable; many fine and very fine roots; 2 percent pebbles; neutral; abrupt smooth boundary.
Bt1—9 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common very fine roots; common faint brown (10YR 4/3) organic coatings on faces of peds; few prominent brown (7.5YR 4/2) clay films on faces of peds; 2 percent pebbles; neutral; clear smooth boundary.
Bt2—13 to 21 inches; yellowish brown (10YR 5/4) silty clay; strong medium and fine subangular blocky structure; firm; common very fine roots; many distinct brown (7.5YR 4/2 and 4/4) clay films on faces of peds; 2 percent pebbles; neutral; gradual smooth boundary.
Bt3—21 to 33 inches; yellowish brown (10YR 5/4) silty clay; weak medium prismatic structure parting to strong medium subangular blocky; firm; few very fine roots; many distinct brown (7.5YR 4/2 and 4/4) clay films on faces of peds; 2 percent pebbles; slightly alkaline in the upper part grading to moderately alkaline in the lower part; gradual wavy boundary.
BCt—33 to 45 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium platy structure parting to

weak medium subangular blocky; firm; few very fine roots; few distinct brown (7.5YR 4/4) clay films on faces of peds; common distinct grayish brown (10YR 5/2) carbonate coatings on faces of peds; very few distinct light gray (10YR 7/1) carbonate coatings in old root channels; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; few distinct light gray (10YR 7/1) carbonate threads and accumulations in the matrix; 5 percent limestone and shale pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd—45 to 80 inches; brown (10YR 5/3) silty clay loam; massive with weak thick platy partings; very firm; common distinct light gray (10YR 7/2) carbonate coatings on faces of vertical partings; common faint grayish brown (10YR 5/2) iron depletions on faces of vertical partings; common faint very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation on faces of vertical partings; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; 5 percent limestone and shale pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 24 to 50 inches
Depth to carbonates: 20 to 40 inches
Depth to bedrock: Greater than 80 inches

Ap or A horizon:
Color—hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture—silt loam or silty clay loam
Content of rock fragments—0 to 10 percent

Bt horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 4 to 6
Texture—silty clay loam, clay loam, or silty clay
Content of rock fragments—0 to 10 percent

Cd horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture—silty clay loam or clay loam
Content of rock fragments—2 to 15 percent

Martinsville Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Outwash; outwash overlying till in the till substratum phase
Landform: Outwash terraces, ground moraines
Position on the landform: Summits, shoulders, backslopes
Slope range: 2 to 6 percent
Adjacent soils: Blount, Glynwood
Taxonomic classification: Fine-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon

Martinsville loam, till substratum, 2 to 6 percent slopes, in Thompson Township; about 3.5 miles northwest of Radnor; 1,050 feet north and 600 feet east of the intersection of Ohio Highway 203 and Hoskins Road:

Ap—0 to 11 inches; brown (10YR 4/3) loam, rubbed, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure parting to weak fine granular; friable; common fine and very fine roots; 1 percent pebbles; neutral; abrupt smooth boundary.

Bt1—11 to 17 inches; dark yellowish brown (10YR 4/4) loam; moderate medium and fine subangular blocky structure; friable; few very fine roots; few distinct brown (7.5YR 4/4) clay films between sand grains; common faint dark brown (10YR 3/3) organic coatings on faces of peds; 1 percent pebbles; neutral; gradual smooth boundary.

Bt2—17 to 26 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; friable; few very fine roots; many distinct brown (7.5YR 4/4) clay films on faces of peds; 1 percent pebbles; neutral; gradual wavy boundary.

Bt3—26 to 35 inches; yellowish brown (10YR 5/4) clay loam; moderate medium and fine subangular blocky structure; firm; few very fine roots; many prominent brown (7.5YR 4/2) clay films on faces of peds and in pores; very few prominent black (N 2/0) masses of iron and manganese accumulation on faces of peds; 2 percent fine pebbles; slightly acid; clear wavy boundary.

Bt4—35 to 49 inches; dark yellowish brown (10YR 4/4) and brown (7.5YR 4/2) sandy clay loam; moderate medium subangular blocky structure; friable; few very fine roots; many distinct brown (7.5YR 4/2) clay films on faces of peds; 5 percent fine shale pebbles; strongly acid; clear irregular boundary.

BCt—49 to 55 inches; dark grayish brown (10YR 4/2) sandy loam; moderate medium subangular blocky structure; friable; few very fine roots; many distinct brown (7.5YR 4/2) clay films between sand grains; 1 percent fine shale pebbles; strongly acid; clear irregular boundary.

C1—55 to 65 inches; dark yellowish brown (10YR 4/4) loamy sand with strata of very fine sandy loam;

single grain; loose; 10 percent fine shale pebbles; strongly effervescent; moderately alkaline; clear irregular boundary.

2C2—65 to 80 inches; yellowish brown (10YR 5/4) loam; massive; firm; 5 percent shale and igneous pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 50 to 80 inches
Depth to till: Greater than 80 inches; 60 to 80 inches in the till substratum phase
Depth to carbonates: 50 to 80 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 3 to 6
Texture—loam
Content of rock fragments—0 to 10 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 4 to 6, chroma of 2 to 6
Texture—loam, clay loam, sandy clay loam, sandy loam, fine sandy loam, or very fine sandy loam
Content of rock fragments—0 to 10 percent

C horizon:
Color—hue of 10YR, value of 4 to 6, chroma of 3 to 6
Texture—loamy sand or sandy loam with strata of fine sandy loam and very fine sandy loam
Content of rock fragments—0 to 10 percent

2C horizon:
Color—hue of 10YR, value of 4 to 6, chroma of 3 to 6
Texture—loam
Content of rock fragments—0 to 10 percent

Mentor Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Glaciofluvial deposits
Landform: Kames
Position on the landform: Backslopes, shoulders, summits
Slope range: 12 to 18 percent
Adjacent soils: Bennington, Centerburg
Taxonomic classification: Fine-silty, mixed, mesic Typic Hapludalfs

Typical Pedon

Mentor silt loam, 12 to 18 percent slopes, eroded, in Trenton Township; about 1.5 miles east of Condit; 1,500 feet south and 1,250 feet west of the intersection of County Line Road and Hartford Road:

Ap1—0 to 3 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak coarse granular structure; friable; many fine roots; 2 percent pebbles and shale channers; moderately acid; clear smooth boundary.

Ap2—3 to 7 inches; dark yellowish brown (10YR 4/4) silt loam, light yellowish brown (10YR 6/4) dry; weak coarse subangular blocky structure; friable; many fine roots; many faint brown (10YR 4/3) organic coatings on faces of peds and in pores; 2 percent pebbles and shale channers; very strongly acid; abrupt smooth boundary.

Bt1—7 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common very fine roots; many faint dark yellowish brown (10YR 4/4) and common distinct brown (7.5YR 5/4) clay films on faces of peds and in pores; 2 percent pebbles and shale channers; very strongly acid; gradual smooth boundary.

Bt2—24 to 40 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; few very fine roots; many faint dark yellowish brown (10YR 4/4) and common distinct brown (7.5YR 5/4) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation on faces of peds; few faint brown (10YR 5/3) iron depletions in macropores, in old root channels, and on faces of peds; few prominent yellowish red (5YR 4/6) masses of iron accumulation in rinds surrounding old root channels and on faces of peds; 2 percent pebbles; very strongly acid; gradual wavy boundary.

Bt3—40 to 62 inches; dark yellowish brown (10YR 4/4) silt loam; weak coarse subangular blocky structure; friable; very few very fine roots; few faint dark yellowish brown (10YR 4/4) and few distinct grayish brown (10YR 5/2) clay films on faces of peds and in pores; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation on faces of peds; very strongly acid; gradual irregular boundary.

BCt—62 to 70 inches; yellowish brown (10YR 5/4) silt loam stratified with grayish brown (10YR 5/2) silt; weak thick platy structure; friable; few distinct brown (7.5YR 5/4) clay films on horizontal faces of peds; common coarse distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

C—70 to 80 inches; yellowish brown (10YR 5/4) silt stratified with grayish brown (10YR 5/2) very fine sandy loam; massive; friable; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation on faces of horizontal partings; common coarse prominent strong brown (7.5YR 5/6) irregularly shaped masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 36 to 70 inches
Depth to carbonates: 50 to 70 inches
Depth to bedrock: Greater than 80 inches

Ap or A horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture—silt loam
Content of rock fragments—0 to 2 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 to 6
Texture—silt loam or silty clay loam
Content of rock fragments—0 to 2 percent

C horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 to 6
Texture—stratified silt, silt loam, and very fine sandy loam
Content of rock fragments—0 to 10 percent

Millgrove Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate
Parent material: Outwash
Landform: Outwash terraces, outwash plains
Position on the landform: Flat areas, depressions, drainageways
Slope range: 0 to 2 percent
Adjacent soils: Gallman, Glynwood, Jimtown, Rossburg, Scioto, Stone
Taxonomic classification: Fine-loamy, mixed, mesic Typic Argiaquolls

Typical Pedon

Millgrove silt loam, on a slope of less than 1 percent; the official soil series description pedon located in Morrow County, Ohio; Canaan Township; about 3.5 miles northwest of Denmark; 1,188 feet north and 1,920 feet east of the southwest corner of sec. 5, T. 5 S., R. 17 E.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to weak medium granular; friable; few medium tubular pores; few rock fragments; slightly acid; abrupt smooth boundary.

BA—9 to 12 inches; very dark gray (10YR 3/1) clay loam, gray (10YR 5/1) dry; weak fine subangular blocky structure; friable; few fine vesicular and tubular pores; common medium distinct yellowish brown (10YR 5/4) and common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few rock fragments; slightly acid; clear smooth boundary.

Btg1—12 to 17 inches; gray (10YR 5/1) clay loam; weak medium subangular blocky structure; friable; few fine vesicular and few medium vesicular and tubular pores; few faint dark gray (10YR 4/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings on vertical faces of peds; common medium distinct yellowish brown (10YR 5/4) and common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few rock fragments; slightly acid; clear smooth boundary.

Btg2—17 to 21 inches; gray (10YR 5/1) clay loam; weak medium subangular blocky structure; friable; few fine vesicular and tubular pores; many distinct dark gray (10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on vertical faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent pebbles; neutral; clear smooth boundary.

Btg3—21 to 30 inches; gray (10YR 5/1) clay loam; weak coarse subangular blocky structure; firm; few fine roots; few fine vesicular and tubular pores; many distinct dark gray (10YR 4/1) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/4) and common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent pebbles; neutral; clear smooth boundary.

Btg4—30 to 41 inches; gray (10YR 5/1) clay loam; moderate medium subangular blocky structure;

firm; few fine vesicular and tubular and few medium pores; common distinct dark gray (10YR 4/1) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent pebbles; slightly alkaline; clear smooth boundary.

BCtg—41 to 50 inches; gray (10YR 5/1) loam; weak medium subangular blocky structure; firm; few fine vesicular and tubular pores; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/4) and common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; 10 percent pebbles; slightly alkaline; gradual smooth boundary.

C1—50 to 59 inches; yellowish brown (10YR 5/4) gravelly loam; massive; friable; 15 percent pebbles; common fine strong brown (7.5YR 5/8) weathered sandstone fragments; slightly effervescent; slightly alkaline; clear smooth boundary.

C2—59 to 74 inches; brown (10YR 4/3) gravelly sandy loam; massive; friable; 30 percent pebbles; common medium strong brown (7.5YR 5/8) weathered sandstone fragments; slightly effervescent; slightly alkaline; clear smooth boundary.

C3—74 to 80 inches; dark grayish brown (10YR 4/2) gravelly loamy sand; massive; very friable; 30 percent pebbles; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the solum: 30 to 55 inches
Depth to carbonates: 24 to 55 inches
Depth to bedrock: Greater than 80 inches

Ap and A horizons:
Color—hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture—silty clay loam or silt loam
Content of rock fragments—2 to 5 percent

Btg horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 or 2
Texture—silty clay loam, clay loam, or loam
Content of rock fragments—2 to 10 percent

2C horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 3
Texture—the very gravelly, extremely gravelly, very cobbly, or extremely cobbly analogs of loam, sandy loam, coarse sandy loam, or silt loam
Content of rock fragments—35 to 80 percent

Milton Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate or moderately slow
Parent material: Loess, till, and the underlying residuum derived from limestone or dolostone
Landform: Ground moraines, end moraines
Position on the landform: Summits, shoulders, backslopes
Slope range: 2 to 18 percent
Adjacent soils: Glynwood, Lybrand
Taxonomic classification: Fine, mixed, mesic Typic Hapludalfs

Typical Pedon

Milton silt loam, 2 to 6 percent slopes, in Concord Township; about 1.25 miles southeast of Rathbone; 1,120 feet north and 1,250 feet east of the intersection of Ohio Highway 745 and Cook Road:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium granular structure; friable; common fine and very fine roots; 1 percent shale pebbles; neutral; abrupt smooth boundary.

Bt1—10 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; many distinct brown (10YR 4/3) organic coatings on faces of peds; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 1 percent limestone and shale pebbles; neutral; clear smooth boundary.

2Bt2—15 to 23 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; firm; few very fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 5 percent limestone and shale pebbles; neutral; clear smooth boundary.

2Bt3—23 to 28 inches; dark yellowish brown (10YR 4/4) clay; moderate medium subangular blocky structure; firm; few very fine roots; many distinct brown (7.5YR 4/2) clay films on faces of peds; neutral; 5 percent igneous pebbles; clear irregular boundary.

3BCt—28 to 31 inches; yellowish brown (10YR 5/6) extremely gravelly clay loam; weak fine subangular blocky structure; firm; few very fine roots; many prominent brown (7.5YR 4/2) clay films on faces of peds and on rock fragments; 70 percent rock fragments, mainly limestone; strongly effervescent; slightly alkaline; abrupt smooth boundary.

3R—31 to 32 inches; white, hard limestone.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

Ap horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—1 to 5 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 to 6
Texture—silt loam or silty clay loam
Content of rock fragments—1 to 10 percent

2Bt horizon:
Color—hue of 10YR or 7.5YR, value of 3 to 5, chroma of 3 to 6
Texture—clay, silty clay, or clay loam
Content of rock fragments—1 to 10 percent

3BCt horizon:
Color—hue of 5YR to 5Y, value of 4 or 5, chroma of 2 to 6
Texture—clay, silty clay, silty clay loam, clay loam, or the gravelly to extremely gravelly, cobbly to extremely cobbly, or channery to extremely channery analogs of these textures
Content of rock fragments—2 to 70 percent

Pacer Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the upper part; moderately slow to very slow in the lower part
Parent material: Outwash and till
Landform: Outwash terraces
Position on the landform: Flat areas
Slope range: 0 to 2 percent
Adjacent soils: Gallman, Glynwood, Millgrove, Pewamo
Taxonomic classification: Fine-loamy, mixed, mesic Oxyaquic Argiudolls

Typical Pedon

Pacer silt loam, 0 to 2 percent slopes, in Marlboro Township; about 2.5 miles southeast of Norton; 780 feet north and 4,930 feet west of the intersection of Horseshoe Road and Cole Road:

Ap—0 to 10 inches; dark brown (10YR 3/3) silt loam, grayish brown (10YR 5/2) dry; moderate medium subangular blocky structure parting to moderate medium granular; friable; common fine and medium roots; 1 percent pebbles; moderately acid; clear smooth boundary.

A—10 to 14 inches; silt loam, very dark grayish brown (10YR 3/2) broken, dark brown (10YR 3/3) rubbed, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; common fine roots; 1 percent pebbles; slightly acid; clear wavy boundary.

Bt1—14 to 26 inches; brown (10YR 4/3) gravelly loam; weak medium subangular blocky structure; friable; few fine roots; common distinct brown (7.5YR 4/2) clay films on faces of peds and in pores; 30 percent pebbles; slightly acid; gradual wavy boundary.

Bt2—26 to 34 inches; brown (7.5YR 4/3) very gravelly loam; weak coarse subangular blocky structure; friable; few fine roots; common faint dark brown (7.5YR 3/2) clay films on faces of peds and in pores; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few medium prominent yellowish red (5YR 5/8) masses of iron accumulation on pebbles; few fine faint brown (7.5YR 4/4) masses of iron accumulation in the matrix; few fine distinct dark grayish brown (10YR 4/2) iron depletions in the matrix; few medium prominent dark red (2.5YR 3/6) iron and manganese nodules in the matrix; 40 percent pebbles; neutral; clear wavy boundary.

Bt3—34 to 51 inches; brown (10YR 4/3) gravelly clay loam; weak coarse subangular blocky structure; friable; strata of gravelly sandy clay loam; many distinct very dark grayish brown (10YR 3/2) clay films on faces of peds and on pebbles; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation on pebbles; few medium distinct brown (7.5YR 4/4) iron and manganese nodules in the matrix; 45 percent pebbles; neutral; abrupt smooth boundary.

2BCt—51 to 66 inches; yellowish brown (10YR 5/4) silt loam; weak coarse subangular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; few medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/6) masses of iron and manganese accumulation in the matrix;

10 percent pebbles; slightly alkaline; gradual wavy boundary.

2Cd—66 to 80 inches; brown (10YR 4/3) silt loam; massive; very firm; common faint grayish brown (10YR 5/2) carbonate coatings on faces of horizontal and vertical partings; few fine faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; few medium prominent strong brown (7.5YR 5/6) iron and manganese nodules in the matrix; 10 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the solum: 40 to 70 inches
Depth to carbonates: 40 to 70 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 3, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—0 to 15 percent

A horizon:
Color—hue of 10YR, value of 2 or 3, chroma of 1 to 3
Texture—silt loam
Content of rock fragments—0 to 15 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 2 to 6
Texture—clay loam, sandy clay loam, loam, or the gravelly or very gravelly analogs of these textures
Content of rock fragments—10 to 50 percent

2Cd or 2C horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 1 to 4
Texture—silt loam or loam
Content of rock fragments—2 to 15 percent

Pewamo Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow
Parent material: Till
Landform: Ground moraines, end moraines
Position on the landform: Depressions, flat areas, drainageways
Slope range: 0 to 1 percent
Adjacent soils: Blount, Glynwood, Bennington, Condit, Cardington, Centerburg
Taxonomic classification: Fine, mixed, mesic Typic Argiaquolls

Typical Pedon

Pewamo silty clay loam, 0 to 1 percent slopes, in Oxford Township; about 2.5 miles northwest of Leonardsburg; 625 feet south and 750 feet west of the intersection of Steamtown Road and Shoemaker Road:

Ap1—0 to 5 inches; very dark gray (10YR 3/1) silty clay loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; common very fine roots; slightly acid; clear smooth boundary.

Ap2—5 to 9 inches; very dark gray (10YR 3/1) silty clay loam, grayish brown (10YR 5/2) dry; weak medium and coarse subangular blocky structure; firm; few very fine roots; slightly acid; abrupt smooth boundary.

A—9 to 13 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; moderate fine and medium subangular blocky structure; firm; very few very fine roots; many faint black (N 2/0) organic coatings on faces of peds; common fine prominent light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Btg—13 to 20 inches; dark grayish brown (10YR 4/2) silty clay; moderate fine and medium subangular blocky structure; firm; very few very fine roots; few faint dark gray (10YR 4/1) clay films on faces of peds; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; many faint gray (10YR 5/1) iron depletions on faces of peds and in root channels; many medium distinct yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt1—20 to 39 inches; yellowish brown (10YR 5/4) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; very few very fine roots; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings in old root channels and on faces of peds; many distinct gray (10YR 5/1) iron depletions on faces of peds and in pores; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation on faces of peds; many medium distinct yellowish brown (10YR 5/8) irregularly shaped masses of iron accumulation in the matrix; 2 percent pebbles; neutral; clear wavy boundary.

Bt2—39 to 57 inches; yellowish brown (10YR 5/4) silty clay loam; moderate coarse and medium subangular blocky structure; firm; very few very fine roots; few distinct grayish brown (10YR 5/2) clay films on faces of peds; many distinct gray (10YR 5/1) iron depletions on faces of peds and in pores; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation on faces of peds; very dark gray (10YR 3/1) krotovina 2 inches in diameter; common medium prominent strong brown (7.5YR 5/8) irregularly shaped masses of iron accumulation in the matrix; 3 percent pebbles; neutral; gradual wavy boundary.

BC—57 to 68 inches; brown (10YR 4/3) silty clay loam; weak very coarse subangular blocky structure; firm; very few very fine roots; common distinct gray (10YR 5/1) iron depletions in old root channels and on faces of peds; common medium faint yellowish brown (10YR 5/4) irregularly shaped masses of iron accumulation in the matrix; 5 percent black shale and limestone pebbles; strongly effervescent; slightly alkaline; gradual wavy boundary.

C—68 to 80 inches; brown (10YR 4/3) silty clay loam; massive; firm; 5 percent black shale and limestone pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the solum: 40 to 70 inches
Depth to carbonates: 30 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap and A horizons:
Color—hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture—silty clay loam
Content of rock fragments—0 to 5 percent

Btg and Bt horizons:
Color—hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture—silty clay loam, silty clay, clay, or clay loam
Content of rock fragments—0 to 10 percent

C horizon:
Color—hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, chroma of 1 to 3
Texture—silty clay loam or clay loam
Content of rock fragments—2 to 15 percent

Rarden Series

Depth class: Moderately deep
Drainage class: Moderately well drained
Permeability: Slow
Parent material: Residuum derived from shale
Landform: Dissected areas on till plains
Position on the landform: Summits, shoulders, backslopes
Slope range: 2 to 50 percent
Adjacent soils: Brecksville, Centerburg, Hyatts, Latham
Taxonomic classification: Fine, mixed, mesic Aquultic Hapludalfs

Typical Pedon

Rarden silt loam, 20 to 50 percent slopes, eroded, in Genoa Township; about 1.25 miles southwest of Harlem; 1,070 feet north and 990 feet west of the intersection of Red Bank Road and Duncans Glen Drive:

Ap—0 to 3 inches; brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; many fine and medium roots; few soft shale fragments; strongly acid; clear smooth boundary.

BE—3 to 6 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; common fine and very fine roots; many faint brown (7.5YR 5/4) clay depletions on faces of peds; few soft shale fragments; very strongly acid; clear smooth boundary.

Bt1—6 to 13 inches; yellowish red (5YR 5/6) silty clay; strong fine and medium subangular blocky structure; firm; common fine and medium roots; many distinct reddish brown (5YR 4/4) clay films on faces of peds; few distinct pinkish gray (5YR 6/2) clay depletions in root channels; few fine prominent gray (5YR 6/1) irregularly shaped iron depletions in the matrix; few soft shale fragments; very strongly acid; gradual smooth boundary.

Bt2—13 to 19 inches; yellowish red (5YR 5/6) silty clay; strong medium angular blocky structure parting to moderate fine subangular blocky; firm; few fine roots; many prominent brown (7.5YR 5/4) and common distinct reddish brown (5YR 4/4) clay films on faces of peds; few prominent light gray (5YR 7/1) clay depletions in root channels; few fine prominent gray (5YR 6/1) irregularly shaped iron depletions in the matrix; 5 percent soft shale fragments; very strongly acid; gradual smooth boundary.

Bt3—19 to 28 inches; reddish brown (5YR 5/4) silty clay; moderate medium and coarse subangular blocky structure; firm; few fine and medium roots; many distinct brown (7.5YR 5/4) and few prominent gray (10YR 6/1) clay films on faces of peds; very few prominent light gray (N 7/0) iron depletions in root channels; few soft shale fragments; very strongly acid; gradual smooth boundary.

Bt4—28 to 38 inches; yellowish red (5YR 5/6) silty clay loam; weak medium and coarse subangular blocky structure; firm; few fine and very fine roots; common prominent brown (7.5YR 5/4), common prominent light brownish gray (10YR 6/2), and few distinct reddish brown (5YR 4/4) clay films on faces of peds; few prominent gray (10YR 6/1) iron depletions in root channels; 30 percent soft shale fragments; very strongly acid; clear wavy boundary.

Cr—38 to 48 inches; alternating layers of dark reddish gray (5YR 4/2) and olive brown (2.5Y 4/3), soft shale.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

Ap horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 2 to 4
Texture—silt loam
Content of rock fragments—0 to 5 percent

Bt horizon:
Color—hue of 2.5YR to 7.5YR, value of 3 to 7, chroma of 4 to 8
Texture—silty clay, silty clay loam, or the channery analogs of these textures
Content of rock fragments—0 to 20 percent

C horizon:
Color—hue of 7.5YR to 5Y, value of 5 or 6, chroma of 4 to 6
Texture—silty clay, clay, silty clay loam, or the channery analogs of these textures
Content of rock fragments—0 to 20 percent

Rossburg Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Alluvium
Landform: Flood plains, slightly higher areas adjacent to the stream channel
Position on the landform: Flat areas
Slope range: 0 to 2 percent
Adjacent soils: Gallman, Lybrand
Taxonomic classification: Fine-loamy, mixed, mesic Fluventic Hapludolls

Typical Pedon

Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded, in Troy Township; about 1 mile north of Delaware; 875 feet north and 2,375 feet west of the intersection of Panhandle Road and Case Road:

Ap—0 to 14 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to weak coarse granular in the upper 3 inches; friable; few fine and very fine roots; 5 percent pebbles; neutral; clear smooth boundary.

A—14 to 20 inches; dark brown (10YR 3/3) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; few fine and very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bw—20 to 38 inches; brown (10YR 4/3) silt loam; common medium faint dark yellowish brown (10YR 4/4) mottles; weak medium and coarse subangular blocky structure; friable; few fine and very fine roots; many faint dark brown (10YR 3/3) organic coatings on faces of peds; neutral; gradual smooth boundary.

BC—38 to 67 inches; brown (10YR 4/3) silt loam; weak coarse subangular blocky structure; friable; few fine and very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings in old root channels; neutral; gradual smooth boundary.

C—67 to 80 inches; brown (10YR 4/3), stratified silt loam and loam; massive; friable; few medium distinct brown (7.5YR 4/4) irregularly shaped masses of iron accumulation in the matrix; few medium distinct grayish brown (2.5Y 5/2) irregularly shaped iron depletions in the matrix; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Thickness of the solum: 40 to 80 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 3, chroma of 2 or 3

Texture—silt loam
Content of rock fragments—0 to 5 percent

A horizon:
Color—hue of 10YR, value of 2 or 3, chroma of 2 or 3
Texture—silt loam or silty clay loam
Content of rock fragments—0 to 5 percent

Bw horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 or 4
Texture—silt loam or loam
Content of rock fragments—0 to 5 percent

C horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture—silt loam, loam, sandy loam, or the gravelly analogs of these textures
Content of rock fragments—0 to 20 percent

Scioto Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate or moderately slow in the upper part of the subsoil; moderate or moderately rapid in the lower part of the subsoil and in the substratum
Parent material: Outwash
Landform: Outwash terraces, eskers, kames
Position on the landform: Flat areas, rises, summits, shoulders, and backslopes on outwash terraces; summits, shoulders, and backslopes on eskers and kames
Slope range: 0 to 12 percent
Adjacent soils: Glynwood, Rossburg, Milton
Taxonomic classification: Loamy-skeletal, mixed, mesic Typic Hapludalfs

Typical Pedon

Scioto silt loam, 0 to 2 percent slopes, in Radnor Township; about 3 miles south-southwest of Radnor; 560 feet south and 340 feet west of the intersection of River Road and Mink Street Road:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak thick platy structure parting to moderate fine granular; friable; common fine and very fine roots; 9 percent limestone pebbles; 1 percent limestone cobbles; moderately acid; abrupt smooth boundary.

Bt1—10 to 16 inches; brown (7.5YR 4/4) clay; moderate fine and medium subangular blocky structure; firm; few fine and very fine roots; many faint brown (7.5YR 4/4) clay films and common distinct brown (7.5YR 4/2) clay films on vertical faces of peds; 8 percent limestone pebbles; 2 percent limestone cobbles; neutral; clear wavy boundary.

2Bt2—16 to 28 inches; brown (7.5YR 5/4) extremely cobbly silty clay loam; weak fine and medium subangular blocky structure; firm; few fine and very fine roots; many distinct brown (7.5YR 4/2) clay films on faces of peds; 5 percent soft limestone around rock fragments; 40 percent limestone cobbles; 25 percent limestone pebbles; 2 percent limestone stones; slightly effervescent; slightly alkaline; gradual irregular boundary.

2Bt3—28 to 51 inches; yellowish brown (10YR 5/4) extremely cobbly silt loam and extremely cobbly loam; weak coarse subangular blocky structure; firm; few fine and very fine roots; common prominent brown (7.5YR 4/2) clay films on faces of peds and on rock fragments; 50 percent limestone cobbles; 20 percent limestone pebbles; slightly effervescent; moderately alkaline; gradual irregular boundary.

2C—51 to 80 inches; yellowish brown (10YR 5/4) extremely stony coarse sandy loam; massive; friable; pockets of loam; few very fine roots; few distinct brown (7.5YR 4/4) clay films in pores and on rock fragments; 40 percent limestone stones; 20 percent limestone cobbles; 15 percent limestone pebbles; 5 percent rock fragments of mixed lithology; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 35 to 60 inches
Depth to carbonates: 10 to 45 inches
Depth to bedrock: Greater than 80 inches

Ap or A horizon:
Color—hue of 10YR or 7.5YR, value of 3 or 4, chroma of 3 or 4
Texture—silt loam or silty clay loam
Content of rock fragments—0 to 15 percent

Bt horizon:
Color—hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 or 4
Texture—silty clay loam, clay, clay loam, or silty clay
Content of rock fragments—5 to 15 percent

2Bt horizon:
Color—hue of 10YR or 7.5YR, value of 3 to 5, chroma of 3 to 6

Texture—the very gravelly, extremely gravelly, very cobbly, or extremely cobbly analogs of silty clay loam, silt loam, clay loam, or loam
Content of rock fragments—35 to 80 percent

2C horizon:
Color—hue of 10YR or 7.5YR, value of 3 to 5, chroma of 3 to 6
Texture—the extremely cobbly or extremely stony analogs of loam, sandy loam, coarse sandy loam, or loamy coarse sand
Content of rock fragments—65 to 90 percent

Shoals Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Alluvium
Landform: Flood plains
Position on the landform: Flat areas
Slope range: 0 to 2 percent
Adjacent soils: Amanda, Centerburg, Bennington
Taxonomic classification: Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents

Typical Pedon

Shoals silt loam, occasionally flooded, in Knox County; Middlebury Township; just east of Batemantown; about 250 feet east along Yankee Street Road from the intersection of Yankee Street Road and Darlington Road, then about 400 feet south; T. 8 N., R. 14 W.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; few pebbles; neutral; abrupt smooth boundary.

Bg1—10 to 16 inches; grayish brown (10YR 5/2) silt loam; weak fine subangular blocky structure; friable; many medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; few pebbles; neutral; clear smooth boundary.

Bg2—16 to 21 inches; grayish brown (2.5Y 5/2) silt loam; weak fine subangular blocky structure; friable; thin strata of very fine sandy loam; many coarse prominent yellowish brown (10YR 5/6) and few coarse distinct brown (10YR 5/3) masses of iron accumulation in the matrix; common concretions in the matrix; 5 percent pebbles; neutral; clear smooth boundary.

Bw—21 to 29 inches; yellowish brown (10YR 5/4) loam; weak fine subangular blocky structure; very friable; thin strata of silt loam and sandy loam; common coarse distinct yellowish brown (10YR 5/6) and common medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few concretions in the matrix; 5 percent pebbles; slightly alkaline; clear smooth boundary.

C1—29 to 42 inches; brown (10YR 5/3), stratified loam, silt loam, and sandy loam; massive; very friable; many coarse faint grayish brown (10YR 5/2) iron depletions in the matrix; few coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few large concretions in the matrix; slightly alkaline; clear wavy boundary.

C2—42 to 60 inches; yellowish brown (10YR 5/4), stratified silt loam, loam, and sandy loam; massive; friable; thin strata of dark gray (5Y 4/1) silty clay loam; common coarse distinct gray (10YR 5/1) iron depletions in the matrix; common coarse prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline.

Range in Characteristics

Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—0 to 3 percent

Bg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 or 2
Texture—loam or silt loam with thin strata of very fine sandy loam, fine sandy loam, or sandy loam
Content of rock fragments—0 to 5 percent

Bw horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, chroma of 3 or 4
Texture—loam or silt loam with thin strata of very fine sandy loam, fine sandy loam, or sandy loam
Content of rock fragments—0 to 5 percent

C horizon:
Color—hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture—stratified loam, silt loam, or sandy loam
Content of rock fragments—0 to 15 percent

Sloan Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate or moderately slow
Parent material: Alluvium; alluvium overlying till in the till substratum phase
Landform: Flood plains
Position on the landform: Backswamps, old stream channels, depressions, flat areas
Slope range: 0 to 2 percent
Adjacent soils: Amanda, Cardington, Centerburg, Glynwood, Lobdell, Rossburg
Taxonomic classification: Fine-loamy, mixed, mesic Fluvaquentic Endoaquolls

Typical Pedon

Sloan silt loam, till substratum, 0 to 2 percent slopes, occasionally flooded, in Trenton Township; about 1 mile south of Condit; 1,110 feet south and 450 feet west of the intersection of Ohio Highway 605 and Murphy Road:

Ap1—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; many fine and very fine roots; neutral; clear wavy boundary.

Ap2—7 to 13 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to weak medium granular; friable; common fine and very fine roots; many prominent reddish brown (5YR 4/4) masses of iron accumulation in pores and old root channels; neutral; clear smooth boundary.

A—13 to 19 inches; very dark gray (10YR 3/1) silty clay loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; very friable; common fine and very fine roots; common prominent yellowish red (5YR 4/6) masses of iron accumulation in root channels; 2 percent pebbles; neutral; clear smooth boundary.

Bg1—19 to 23 inches; dark gray (10YR 4/1) loam; moderate fine and medium subangular blocky structure; friable; common fine and very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in root channels; common medium prominent olive brown (2.5Y 4/4) and few fine prominent yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; 2 percent pebbles; neutral; clear smooth boundary.

Bg2—23 to 37 inches; grayish brown (2.5Y 5/2) loam; weak medium subangular blocky structure; friable; few fine and very fine roots; common distinct gray (10YR 5/1) coatings in root channels; many medium prominent yellowish brown (10YR 5/6) irregularly shaped masses of iron accumulation in the matrix; common medium distinct gray (N 6/0) irregularly shaped iron depletions in the matrix; 2 percent pebbles; neutral; clear wavy boundary.

Cg1—37 to 42 inches; gray (10YR 5/1) gravelly loam; massive; friable; 20 percent pebbles; neutral; gradual wavy boundary.

Cg2—42 to 50 inches; grayish brown (2.5Y 5/2) loam; massive; friable; many medium prominent reddish yellow (7.5YR 6/8) irregularly shaped masses of iron accumulation in the matrix; 15 percent pebbles; neutral; gradual wavy boundary.

Cg3—50 to 56 inches; mixed dark gray (10YR 4/1) and very dark gray (10YR 3/1) silt loam; massive; friable; 5 percent pebbles; neutral; clear wavy boundary.

Cg4—56 to 61 inches; grayish brown (2.5Y 5/2) very gravelly loam; massive; friable; 35 percent pebbles; slightly effervescent; slightly alkaline; clear wavy boundary.

2Cg5—61 to 80 inches; dark gray (10YR 4/1) clay loam; massive; firm; 10 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the solum: 20 to 55 inches
Depth to till: Greater than 80 inches; 60 to 80 inches in the till substratum phase
Depth to carbonates: 30 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color—hue of 10YR, value of 3, chroma of 2
Texture—silt loam or silty clay loam
Content of rock fragments—0 to 2 percent

A horizon:
Color—hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture—silty clay loam or silt loam
Content of rock fragments—0 to 2 percent

Bg horizon:
Color—hue of 10YR, 2.5Y, or N, value of 4 or 5, chroma of 0 to 2
Texture—silty clay loam, silt loam, loam, or clay loam; stratified in some pedons
Content of rock fragments—0 to 5 percent

Cg or C horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, chroma of 1 to 4

Texture—clay loam, silty clay loam, loam, silt loam, or the gravelly or very gravelly analogs of these textures
Content of rock fragments—0 to 35 percent

2C horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture—clay loam
Content of rock fragments—0 to 15 percent

Smothers Series

Depth class: Moderately deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Till overlying sandstone
Landform: Ground moraines
Position on the landform: Flat areas, rises, knolls, backslopes
Slope range: 0 to 4 percent
Adjacent soils: Bennington, Hyatts, Centerburg, Loudonville, Pewamo
Taxonomic classification: Fine, mixed, mesic Aeric Epiaqualfs

Typical Pedon

Smothers silt loam, 0 to 2 percent slopes, in Harlem Township; about 0.75 mile southwest of Harlem; 2,150 feet south and 900 feet east of the intersection of Gorsuch Road and Red Bank Road:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; common fine roots; neutral; abrupt smooth boundary.
Bt1—10 to 22 inches; yellowish brown (10YR 5/4) silty clay; moderate coarse angular blocky structure parting to moderate medium subangular blocky; firm; few very fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common distinct gray (10YR 6/1) clay depletions on vertical faces of peds in the lower 4 inches; common medium distinct yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common fine distinct gray (10YR 5/1) iron depletions in the matrix; 10 percent rock fragments, both flat and rounded; slightly alkaline; clear irregular boundary.
2Bt2—22 to 30 inches; dark yellowish brown (10YR 4/4) extremely flaggy silty clay; weak coarse subangular blocky structure; firm; few very fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; many prominent gray (N 5/0) clay films on rock fragments; common medium distinct yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common fine distinct gray (10YR 6/1) iron depletions in the matrix; 70 percent sandstone flagstones; slightly alkaline; abrupt smooth boundary.
2R—30 to 31 inches; light olive brown (2.5Y 5/6), hard, fine grained sandstone.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

Ap or A horizon:
Color—hue of 10YR, value of 3 to 5, chroma of 2 or 3
Texture—silt loam
Content of rock fragments—0 to 15 percent

Bt horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 6
Texture—silty clay, silty clay loam, or clay loam
Content of rock fragments—2 to 15 percent

2Bt horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture—the channery, very channery, extremely channery, flaggy, very flaggy, or extremely flaggy analogs of silty clay, silty clay loam, or clay loam
Content of rock fragments—15 to 75 percent

Stone Series

Depth class: Deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow in the upper part; moderate or moderately rapid in the lower part
Parent material: Drift overlying limestone or dolostone
Landform: Outwash terraces, abandoned stream terraces, outwash plains
Position on the landform: Flat areas, depressions
Slope range: 0 to 2 percent
Adjacent soils: Blount, Glynwood, Leoni, Milton, Pewamo, Scioto
Taxonomic classification: Fine-loamy, mixed, mesic Aquic Hapludolls

Typical Pedon

Stone silty clay loam, 0 to 2 percent slopes, in Radnor Township; about 2.5 miles south of Radnor; 1,750 feet north and 2,010 feet west of the intersection of Lawrence Road and Meredith Road:

Ap—0 to 12 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate medium subangular blocky structure; firm; common medium and fine roots; 2 percent igneous and limestone cobbles and chert pebbles; slightly acid; clear wavy boundary.

Bw—12 to 20 inches; light olive brown (2.5Y 5/4) clay loam and silty clay loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; common prominent very dark grayish brown (10YR 3/2) organic coatings on faces of peds; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine prominent strong brown (7.5YR 5/6) iron concretions with diffuse boundaries in the matrix; common medium distinct grayish brown (2.5Y 5/2) iron depletions with diffuse boundaries in the matrix and in pores; 2 percent igneous and limestone cobbles and chert pebbles; neutral; gradual wavy boundary.

2BC—20 to 30 inches; light olive brown (2.5Y 5/4) very gravelly silt loam; weak coarse subangular blocky structure; friable; very few very fine roots; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct grayish brown (2.5Y 5/2) iron depletions with diffuse boundaries in the matrix; 20 percent limestone pebbles; 10 percent limestone cobbles; 5 percent limestone channers; 10 percent weathered limestone pebbles; moderately alkaline; gradual wavy boundary.

2C—30 to 42 inches; yellowish brown (10YR 5/4) very cobbly loam; massive; friable; common medium distinct yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common medium prominent grayish brown (2.5Y 5/2) iron depletions with diffuse boundaries in the matrix; 30 percent limestone cobbles; 20 percent limestone pebbles; 5 percent shale pebbles; slightly effervescent; moderately alkaline; clear wavy boundary.

3R—42 to 43 inches; white and gray, hard, highly fractured limestone.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the solum: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Depth to bedrock: 40 to 60 inches

Ap horizon:
Color—hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture—silty clay loam or clay loam
Content of rock fragments—2 to 15 percent

Bw horizon:
Color—hue of 10YR, 2.5Y, or 5Y, value of 4 or 5, chroma of 3 or 4
Texture—silty clay loam or clay loam
Content of rock fragments—2 to 15 percent

2BC horizon:
Color—hue of 10YR, 2.5Y, or 5Y, value of 4 or 5, chroma of 1 to 4
Texture—silt loam, loam, or the gravelly, very gravelly, cobbly, or very cobbly analogs of these textures
Content of rock fragments—10 to 50 percent

2C horizon:
Color—hue of 10YR, 2.5Y, 5Y, or N, value of 4 to 7, chroma of 0 to 8
Texture—the very gravelly, extremely gravelly, very channery, extremely channery, very cobbly, extremely cobbly, very stony, or extremely stony analogs of loam or silt loam
Content of rock fragments—35 to 80 percent

Formation of the Soils

This section relates the factors of soil formation to the soils in Delaware County and explains the processes of soil formation.

Factors of Soil Formation

A soil is a three-dimensional natural body consisting of mineral and organic material that can support plant growth. The nature of any soil at a given site is the result of the interaction of five general factors—parent material, climate, plants and animals, relief, and time. Climate and plants and animals have an effect on parent material that is modified by relief over time. Theoretically, if all of these factors were identical at different sites, the soils at these sites would be identical. Differences among the soils are caused by variations in one or more of these factors.

Parent Material

Parent material is the raw material acted on by the soil-forming processes. It largely determines soil texture, which in turn affects other properties, such as natural soil drainage and permeability. The physical and chemical composition of the parent material has an important influence on the kind of soil that forms.

The soils in Delaware County formed in many different kinds of parent material. Most of the soils formed in material deposited by the glaciers that covered the county thousands of years ago or by the meltwater from these glaciers. Other soils formed in alluvium, which is material recently deposited by streams. In a few areas, the soils formed in material that was either weathered from bedrock in place or moved by gravity. Some soils formed in organic material that resulted from the slow accumulation of plant residue in marshes or ponds over a period of thousands of years.

Till is material that was deposited directly by glacial ice with little or no water action. It typically has particles that vary in size, including sand, silt, clay, and some pebbles, cobbles, and larger rock fragments. The composition of the till depends on the nature of the area over which the ice passed before the till was deposited. Some of the material was transported great distances by the ice, but most of the till was of local origin. The till was deposited during the latest major glaciation, the Wisconsinan glaciation. The high-lime till in the western part of Delaware County generally contains more than 18 percent calcium carbonate equivalent. Great quantities of ground limestone and dolostone are present in the till that overlies limestone and dolostone bedrock formations. The low-lime till in the eastern part of the county overlies shale and sandstone bedrock formations.

The till plains in Delaware County are either ground moraines or end moraines. The soils that formed in these two types of deposits have different properties, reflecting variations in the method and rate of till deposition.

Till deposits on ground moraines generally are massive, compact, and dense. They make up the nearly level and gently sloping till plains in Delaware County. The soils that formed in this kind of till generally are compact and are slowly or moderately slowly permeable. The somewhat poorly drained Blount soils formed in high-lime till in the western part of the county. The somewhat poorly drained Bennington soils formed in low-lime till in the eastern part.

Till deposits on end moraines can vary more in texture than those on ground moraines. In some areas they are stratified and tend to be less dense. They make up the two moderately rolling bands of ridges that trend in a roughly southwest-northeast direction through the county. The soils that formed in this kind of till generally are less compact and more permeable than the soils on ground moraines. The moderately well drained Glynwood soils formed in high-lime till on end moraines in the western part of the county. The moderately well drained Centerburg soils formed in low-lime till in the eastern part of the county.

Outwash deposits, laid down by moving water, and lacustrine deposits, laid down in still water, are two general kinds of meltwater deposits. The size of the particles that can be carried suspended in water depends on the speed of the moving water. When the water slows to a given speed, the suspended particles that are larger than a given size will settle in the water. Water slows wherever a stream loses grade or flows into a body of still water. At that time, the coarser sand

and gravel particles settle near the mouth of the stream and the silt and fine clay particles are carried farther into the lake, where they slowly settle.

The soils that formed in outwash deposits are of small extent in Delaware County. They formed in deposits laid down as surging meltwater poured from the glacier, depositing sand and gravel as outwash terraces, outwash plains, kames, and eskers. The meltwater washed away the smaller particles of silt and clay, leaving behind sand and gravel. The soils that formed in outwash generally are permeable. Outwash deposits of Wisconsinan age are in Delaware County.

The amount of natural lime and the proportion of shale, sandstone, limestone, and igneous pebbles in the outwash are determined by the source of the outwash. The outwash deposits on terraces along the Scioto and Olentangy Rivers were derived mostly from limestone and from some shale-influenced drift. The well drained Scioto soils formed in calcareous limestone outwash. Outwash deposits on terraces along Alum Creek and Big Walnut Creek were derived mostly from shale and sandstone and from some limestone-influenced drift. The well drained Gallman soils formed in shale outwash.

Soils that formed in lacustrine deposits have been submerged beneath Alum Creek Lake. They formed in deposits laid down in an old glacial or post-glacial lake. They are described in the previous soil survey of Delaware County published in 1969 (USDA, 1969).

Soils that formed in residuum derived from sedimentary rocks are rare in the eastern part of the county. These areas were glaciated, but the glacier had little or no influence on soil morphology, especially on the steeper slopes. Generally, coarse grained sandstone weathers to coarse sand or medium sand, the finer grained sandstone or siltstone weathers to material that ranges from fine sand or very fine sand to silt, and shale weathers to clay. The degree of cementation of individual rock fragments affects the content of rock fragments in the soils. Latham soils formed in material weathered from black shale of the Ohio shale formation. These soils generally have a clayey texture in the fine-earth fraction (less than 2.0 mm) and a low content of channers (hard shale).

Recent alluvium is soil material deposited by floodwater along streams. The texture of the soil material varies, depending on the speed of the floodwater, the duration of flooding, and the distance from the streambank. Soils that formed in recent alluvium can be highly stratified. The soil horizons are weakly expressed because the soil-forming processes are interrupted with each new deposition. The source of the alluvium generally is material eroded from other soils farther upstream in the watershed. The well drained Rossburg and very poorly drained Sloan soils formed in slightly acid to calcareous recent alluvium derived from soils that formed in calcareous Wisconsinan till and outwash.

Organic soils formed in decomposed plant material that accumulated under water when ponds were filling with water. Ponds, lakes, and marshes naturally age as they fill with organic material derived from algae, sedges, rushes, and other water-tolerant plants. The plant residue accumulates because the permanently wet condition of the soils prevents oxidation and slows decomposition. Freshly exposed organic material commonly has a reddish brown color that rapidly turns black when the material is exposed to the air. The very poorly drained Edwards soils formed in decomposed plant material and marl (precipitated calcium carbonate).

Climate

The climate in Delaware County has significantly affected the soil-forming processes. Climatic factors, such as precipitation and temperature, have influenced the existing plant and animal communities and the physical and chemical weathering of the parent material.

During the colder glacial epoch, the advancing glaciers spread over the county. The cold temperatures in the soil reduced the rate of chemical reactions in the existing soils and in the raw parent material. Increased frost action, resulting from a periglacial climate, caused frost churning in some soils. Strong winds swept across the recently deposited glacial parent material, which was largely devoid of vegetation, and carried away large amounts of silt-sized particles, which were later deposited as loess in areas to the east. When the glacial ice retreated and the climate gradually warmed, deciduous forests became established.

The county currently has a humid, temperate climate, which has persisted for thousands of years. In this climatic environment, physical and chemical weathering of the parent material can occur along with the accumulation of organic matter, the decomposition of minerals, the formation and translocation of clay, the leaching of soluble compounds, and alternating periods of freezing and thawing.

Living Organisms

The vegetation under which a soil forms influences soil properties, such as color, structure, reaction, and content and distribution of organic matter. Vegetation extracts water from the soil, recycles nutrients, and adds organic matter to the soil. Gases derived from root respiration combine with water to form acids that influence the weathering of minerals. Because of a lower content of organic matter, soils that formed under forest vegetation are generally lighter colored than those that formed under grasses.

At the time the survey area was settled, the native vegetation consisted mainly of hardwood forests. Red oak, white oak, sugar maple, and American beech commonly grew on the better drained soils on the Wisconsinan till plains. Pin oak, shagbark hickory, red maple, American elm, and white ash were common on the wetter soils on these till plains. Water-tolerant reeds and sedges, willow, tamarack, and alder grew in scattered small fens or marshes.

Bacteria, fungi, and many other micro-organisms decompose organic matter and release nutrients to growing plants. They influence the formation of peds. Soil properties, such as drainage, temperature, and reaction, influence the type of micro-organisms that live in the soil. Fungi are generally more active in the more acid soils, while bacteria are more active in the less acid soils.

Earthworms, insects, and small burrowing animals mix the soil and create small channels that influence soil aeration and the percolation of water. Earthworms help to incorporate crop residue or other organic material into the soil. The organic material improves tilth. In areas that are well populated with earthworms, the leaf litter that accumulates on the soil in the fall is generally incorporated into the soil by the following spring. If the earthworm population is low, part of the leaf fall can remain on the surface of the soil for several years.

Human activities have significantly influenced soil formation. Native forests have been cleared and developed for farming and other uses. Cultivation has accelerated erosion on sloping soils; wet soils have been drained; and manure, lime, chemical fertilizer, and pesticides have been applied in cultivated areas. Cultivation has affected soil structure and lowered the content of organic matter. The development of land for urban uses or for mining has changed permeability, infiltration, runoff, depth to the water table, depth to parent material and bedrock, and many other soil properties in some areas. These changes often result in increased expense for growing plants in these areas.

Relief

Relief influences soil formation mainly through its effect on runoff and erosion. To a lesser extent, it also influences soil temperature, the plant cover, depth to the water table, and the accumulation and removal of organic matter.

Because it causes differences in external soil drainage, relief can differentiate soils that formed in the same kind of parent material. Water that runs off the more sloping soils can collect in depressions or swales. Glynwood and Pewamo soils both formed in till. The sloping Glynwood soils are moderately well drained. They are in areas where the potential for surface runoff ranges from low to high. The level Pewamo soils are very poorly drained. They are in depressions or drainageways or in flat areas that receive runoff from the higher adjacent soils, such as Glynwood soils.

Slope aspect affects soil formation through its effect on the amount of sunlight and heat energy reaching the soil, the trees that grow on the soil, and the accumulation of organic matter in the soil.

Relief varies only slightly in Delaware County. On the ground moraines the soils generally are nearly level to gently sloping. Relief becomes more pronounced on the two sloping end moraines and along the edge of major stream valleys.

Time

The length of time that the parent material has been exposed to soil-forming processes influences the nature of the soil that forms. The youngest soils in Delaware County, such as Sloan, Lobdell, and Rossburg soils, formed in recent alluvium. These soils can be stratified and have weakly expressed horizons because the soil-forming processes are interrupted with each new deposition.

Glacial deposits of Wisconsinan age are geologically young (less than 20,000 years old), but enough time has elapsed for the initially raw parent material to weather into soils that have distinct horizons. In most of the soils, including Blount, Glynwood, Bennington, and Cardington soils, carbonates have been leached to a depth of about 2 to 4 feet, clay has been translocated from the A horizon to the B horizon, and organic matter has accumulated in the A horizon.

The residuum from the Ohio shale and Berea sandstone are among the oldest of the parent materials in the county; however, this residuum has been exposed only since the retreat of the glaciers. Soils that formed in these parent materials have weakly expressed to well expressed horizons, depending on the nature of the parent material and on the slope and topography. Loudonville soils formed in till overlying sandstone. They have well expressed horizons in the till part, but no horizons have developed in the hard sandstone. Latham soils formed in residuum derived from softer shale. They have well expressed horizons.

Processes of Soil Formation

Soil forms through complex processes that can be grouped into four general categories. These are additions, removals, transfers, and transformations. All of these processes affect soil formation, although in differing degrees.

The accumulation of organic matter in the A horizon of the mineral soils in Delaware County is an example of an addition. This accumulation is the main reason for the dark color of the A horizon. The color of the raw parent material is uniform with increasing depth.

The leaching of carbonates from the upper 2 to 4 feet or more in most of the soils in Delaware County that formed in till is an example of a removal. The parent material of these soils was initially calcareous, but the carbonates have been leached from the upper part of the profile by percolating water.

The translocation of clay from the A horizon to the B horizon in many soils on uplands in the county is an example of a transfer. The A horizon or an E horizon is a zone of eluviation, or loss. The B horizon is a zone of illuviation, or gain. In Blount and Glynwood soils, the B horizon has more clay than the parent material and the A horizon has less clay. In the B horizon of some soils, thin clay films are in pores and on the faces of peds. This clay has been translocated from the A horizon.

An example of a transformation is the reduction and solubilization of ferrous iron. This process takes place under anaerobic conditions in which water replaces molecular oxygen. Gleying, or the reduction of iron, is evident in Condit and Pewamo soils, which have a dominantly gray subsoil. The gray color indicates the presence of reduced ferrous iron, which in turn implies wetness. Reduced iron is soluble, but it commonly has been moved short distances in the soils in Delaware County and has stopped either in the horizon where it originated or in an underlying horizon. Part of this iron can be reoxidized and segregated in the form of stains, concretions, or bright yellow and red redoximorphic concentrations.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

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

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp. A marshy, depressed area on the flood plain between a natural levee or a flood-plain step and the adjacent terrace, till plain, or valley side.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

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 depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

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

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

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

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression. Any relatively sunken part of the earth's surface; especially a low-lying area surrounded by higher ground.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Dissimilar soils. Soils that do not share limits of diagnostic criteria. They behave and perform in a different manner and have different conservation needs or management requirements for the major land uses in the county.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Dolostone. A term for the sedimentary rock formerly called dolomite. A carbonate sedimentary rock consisting chiefly (more than 50 percent by weight) of the mineral dolomite—$CaMg(CO_3)_2$.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that, at some time, move concentrated water and either do not have a defined channel or have only a small defined channel.

Drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

End moraine. Hummocky or hilly belts of till, commonly formed at the front of a stalling ice sheet.

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

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

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess runoff (in tables). Pesticides are transported by surface runoff as either pesticides in solution or pesticides adsorbed to sediments suspended in runoff. Pesticides that are surface transported have a potential to contaminate surface waters, such as lakes, ponds, streams, and rivers.

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

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

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

Flood pool line. The highest water level that can be expected in a lake or reservoir.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot. An area in which the surface layer has more than 15 percent, by volume, rock fragments that are mostly less than 3 inches in diameter.

Gravel pit. An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand and gravel.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground moraine. A till-mantled land surface that is relatively smooth and has little topographic relief.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. 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 ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

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

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

L horizon.—A limnic horizon or layer. Limnic materials include coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

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

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

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.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Krotovinas. Irregular tubular streaks within one layer of material transported from another layer by filling of tunnels made by burrowing animals with material from outside the layer in which they are found.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Limestone. A sedimentary rock consisting chiefly (more than 50 percent by weight) of calcium carbonate, primarily in the form of calcite.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy soil. Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

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

Low adsorption (in tables). Relatively little adhesion between pesticides and soil material, largely as a result of lower organic matter content, a thinner surface layer, and a higher infiltration rate. Pesticides can be leached through a soil and into the water table.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Marsh or swamp. A water-saturated, very poorly drained area intermittently or permanently covered by water. Marshes are dominantly covered by sedges, cattails, and rushes. Swamps are dominantly covered by trees or shrubs.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mine or quarry. An open excavation from which soil and underlying material have been removed, thus exposing the bedrock.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Miscellaneous water. Small manmade water areas that are used for industrial, sanitary, or mining applications and that contain water most of the year.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Muck spot. A small area of organic soil.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natural levee. A long, broad, low ridge or embankment, built by a stream on its flood plain and along both sides of its channel, especially in time of flood when water overflowing the normal banks is forced to deposit the coarsest part of its load. It has a gentle slope away from the stream and toward the surrounding flood plain, and its highest elevation is closest to the river bank.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Organic soil. Soil that is mainly organic material and low in mineral material. Its bulk density is less than that of mineral soil.

Outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Outwash terrace. An outwash deposit extending along a valley downstream from an outwash plain or an end moraine.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

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

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

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop. Exposures of bare bedrock other than lava flows and rock-lined pits.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

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

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sandy soil. Sand or loamy sand.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, the following slope classes are recognized:

Level	0 to 1 percent
Nearly level	0 to 2 percent
Gently sloping	2 to 6 percent
Strongly sloping	6 to 12 percent
Moderately steep	12 to 25 percent
Steep	20 to 50 percent
Very steep	more than 50 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

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

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

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

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat. Very stony soil material is 35 to 60 percent stones, and extremely stony soil material is more than 60 percent stones.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor that were produced during a former stage of erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

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

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

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Swale. A slight, open depression that has no defined channel that can funnel overland or subsurface flow into a drainageway.

Swell-and-swale topography. Topography of a ground moraine having low relief, gentle slopes, and well rounded hills or hummocks interspersed with shallow depressions.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

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.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till. Unsorted, nonstratified drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Typical pedon. The site where the soil was described as representative for the series in the survey area.

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

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Very stony spot. An area in which more than 3 percent of the surface is covered with rock fragments more than 10 inches in diameter.

Water table. A saturated zone in the soil.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot. A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Delaware, Ohio)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	33.3	14.9	24.1	62	-15	12	2.01	1.08	2.82	5	7.5
February---	36.6	17.4	27.0	64	-9	19	1.95	.91	2.83	4	5.4
March------	48.5	27.4	37.9	78	4	107	2.99	1.73	4.10	7	3.6
April------	60.7	37.0	48.8	84	19	290	3.57	1.96	4.99	7	.7
May--------	71.4	47.1	59.2	90	29	597	3.92	2.34	5.33	7	.0
June-------	80.2	56.3	68.3	94	40	848	3.66	2.10	5.05	6	.0
July-------	84.0	60.5	72.3	96	46	967	4.18	2.11	5.98	7	.0
August-----	82.5	58.3	70.4	95	43	943	3.37	1.44	5.01	6	.0
September--	76.2	51.3	63.7	92	33	710	3.01	1.56	4.29	5	.0
October----	64.2	39.2	51.7	84	21	373	2.29	1.43	3.21	5	.0
November---	50.7	31.2	40.9	75	12	130	3.45	1.64	5.02	6	1.4
December---	38.1	21.4	29.8	65	-7	32	2.83	1.56	3.94	7	5.1
Yearly:											
Average---	60.5	38.5	49.5	---	---	---	---	---	---	---	---
Extreme---	---	---	---	97	-17	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,028	37.23	19.86	52.57	72	23.7

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Delaware, Ohio)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 18	May 3	May 15
2 years in 10 later than--	Apr. 13	Apr. 28	May 10
5 years in 10 later than--	Apr. 4	Apr. 20	May 1
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 18	Oct. 7	Sept. 25
2 years in 10 earlier than--	Oct. 23	Oct. 12	Sept. 29
5 years in 10 earlier than--	Nov. 2	Oct. 22	Oct. 7

Table 3.--Growing Season

(Recorded in the period 1961-90 at Delaware, Ohio)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	180	161	140
8 years in 10	186	167	147
5 years in 10	197	178	159
2 years in 10	209	189	171
1 year in 10	215	195	177

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AmD2	Amanda silt loam, 12 to 18 percent slopes, eroded	1,567	0.5
AmE	Amanda silt loam, 18 to 25 percent slopes	838	0.3
AmF	Amanda silt loam, 25 to 50 percent slopes	686	0.2
BeA	Bennington silt loam, 0 to 2 percent slopes	27,485	9.4
BeB	Bennington silt loam, 2 to 4 percent slopes	14,369	4.9
BoA	Blount silt loam, 0 to 2 percent slopes	43,936	15.0
BoB	Blount silt loam, 2 to 4 percent slopes	8,165	2.8
CaB	Cardington silt loam, 2 to 6 percent slopes	14,689	5.0
CaC2	Cardington silt loam, 6 to 12 percent slopes, eroded	3,879	1.3
CeB	Centerburg silt loam, 2 to 6 percent slopes	7,173	2.5
CeC2	Centerburg silt loam, 6 to 12 percent slopes, eroded	1,919	0.7
CnA	Condit silt loam, 0 to 1 percent slopes	837	0.3
EdA	Edwards muck, 0 to 1 percent slopes	20	*
GaC2	Gallman loam, loamy substratum, 6 to 12 percent slopes, eroded	217	*
GbA	Gallman silt loam, loamy substratum, 0 to 2 percent slopes	620	0.2
GbB	Gallman silt loam, loamy substratum, 2 to 6 percent slopes	1,349	0.5
GcB	Gallman silt loam, till substratum, 2 to 6 percent slopes	381	0.1
GwB	Glynwood silt loam, 2 to 6 percent slopes	41,165	14.1
GwC2	Glynwood silt loam, 6 to 12 percent slopes, eroded	7,461	2.5
GzC3	Glynwood silty clay loam, 6 to 12 percent slopes, severely eroded	113	*
HeF	Heverlo silt loam, 25 to 70 percent slopes	291	*
HyA	Hyatts silt loam, 0 to 2 percent slopes	232	*
HyB	Hyatts silt loam, 2 to 4 percent slopes	265	*
JmA	Jimtown silt loam, 0 to 2 percent slopes	438	0.1
LbF	Latham-Brecksville complex, 25 to 70 percent slopes	923	0.3
LeE	Leoni gravelly loam, 12 to 25 percent slopes	70	*
LoA	Lobdell silt loam, channery substratum, 0 to 2 percent slopes, occasionally flooded	1,113	0.4
LsA	Lobdell, channery substratum-Sloan, till substratum complex, 0 to 2 percent slopes, occasionally flooded	1,434	0.5
LvB	Loudonville silt loam, 2 to 6 percent slopes	428	0.1
LyD2	Lybrand silt loam, 12 to 18 percent slopes, eroded	2,660	0.9
LyE2	Lybrand silt loam, 18 to 25 percent slopes, eroded	2,224	0.8
LzD3	Lybrand silty clay loam, 12 to 18 percent slopes, severely eroded	38	*
MaB	Martinsville loam, 2 to 6 percent slopes	24	*
MbB	Martinsville loam, till substratum, 2 to 6 percent slopes	959	0.3
McD2	Mentor silt loam, 12 to 18 percent slopes, eroded	63	*
MfA	Millgrove silt loam, 0 to 2 percent slopes	557	0.2
MgA	Millgrove silty clay loam, 0 to 2 percent slopes	415	0.1
MhA	Millgrove silty clay loam, 0 to 2 percent slopes, rarely flooded	501	0.2
MoB	Milton silt loam, 2 to 6 percent slopes	962	0.3
MoC2	Milton silt loam, 6 to 12 percent slopes, eroded	426	0.1
MpD2	Milton-Lybrand complex, 12 to 18 percent slopes, eroded	461	0.2
PaA	Pacer silt loam, 0 to 2 percent slopes	490	0.2
PwA	Pewamo silty clay loam, 0 to 1 percent slopes	62,603	21.4
Pz	Pits, gravel	31	*
RdB2	Rarden silt loam, 2 to 6 percent slopes, eroded	15	*
RdC2	Rarden silt loam, 6 to 15 percent slopes, eroded	13	*
RdF2	Rarden silt loam, 20 to 50 percent slopes, eroded	210	*
RoA	Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded	1,464	0.5
RsA	Rossburg-Sloan complex, 0 to 2 percent slopes, occasionally flooded	621	0.2
ScA	Scioto silt loam, 0 to 2 percent slopes	788	0.3
ScB	Scioto silt loam, 2 to 6 percent slopes	2,158	0.7
SdC2	Scioto silty clay loam, 6 to 12 percent slopes, eroded	726	0.2
SfA	Scioto silt loam, 0 to 2 percent slopes, rarely flooded	466	0.2
SgA	Shoals silt loam, 0 to 2 percent slopes, occasionally flooded	118	*
SkA	Sloan silt loam, 0 to 2 percent slopes, occasionally flooded	1,473	0.5
SnA	Sloan silt loam, till substratum, 0 to 2 percent slopes, occasionally flooded	2,896	1.0
SoA	Sloan silty clay loam, till substratum, 0 to 2 percent slopes, occasionally flooded	1,670	0.6
SsA	Smothers silt loam, 0 to 2 percent slopes	879	0.3
SsB	Smothers silt loam, 2 to 4 percent slopes	259	*
StA	Stone silty clay loam, 0 to 2 percent slopes	1,070	0.4

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
SuA	Stone clay loam, 0 to 2 percent slopes, rarely flooded	310	0.1
Uc	Udorthents	507	0.2
UdB	Udorthents, clayey-Urban land complex, undulating	12,115	4.1
Up	Udorthents-Pits complex	924	0.3
	Water	9,513	3.3
	Total	292,672	100.0

* Less than 0.1 percent.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay	Bluegrass-ladino
		Bu	Bu	Bu	Tons	AUM*
AmD2-------------- Amanda	4e	---	---	---	3.8	4.2
AmE-------------- Amanda	6e	---	---	---	3.8	4.2
AmF-------------- Amanda	7e	---	---	---	---	---
BeA-------------- Bennington	2w	120	40	45	4.3	5.3
BeB-------------- Bennington	2e	110	35	42	3.8	5.0
BoA-------------- Blount	2w	120	40	45	4.3	5.3
BoB-------------- Blount	2e	110	35	42	3.8	5.0
CaB-------------- Cardington	2e	110	36	42	3.7	4.5
CaC2-------------- Cardington	3e	95	32	40	3.5	4.2
CeB-------------- Centerburg	2e	115	38	45	4.0	4.5
CeC2-------------- Centerburg	3e	100	32	40	3.8	4.5
CnA-------------- Condit	3w	100	35	40	4.0	4.8
EdA-------------- Edwards	5w	---	---	---	---	---
GaC2-------------- Gallman	3e	95	32	38	3.5	4.0
GbA-------------- Gallman	1	120	45	55	4.0	4.5
GbB-------------- Gallman	2e	110	40	50	4.0	4.5
GcB-------------- Gallman	2e	110	40	50	4.0	4.5
GwB-------------- Glynwood	2e	110	36	42	4.0	4.5

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay	Bluegrass-ladino
		Bu	Bu	Bu	Tons	AUM*
GwC2------------- Glynwood	4e	95	32	40	3.8	4.5
GzC3------------- Glynwood	4e	75	20	25	3.5	4.3
HeF-------------- Heverlo	7e	---	---	---	---	---
HyA-------------- Hyatts	2w	110	38	42	3.8	5.0
HyB-------------- Hyatts	2e	100	32	40	3.8	5.0
JmA-------------- Jimtown	2w	110	40	47	4.3	5.3
LbF-------------- Latham-Brecksville	7e	---	---	---	---	---
LeE-------------- Leoni	6e	---	---	---	1.5	3.0
LoA-------------- Lobdell	2w	120	40	50	4.0	5.0
LsA-------------- Lobdell-Sloan	2w	118	40	47	4.0	5.0
LvB-------------- Loudonville	2e	95	32	40	3.8	4.0
LyD2------------- Lybrand	4e	---	---	---	3.8	4.5
LyE2------------- Lybrand	6e	---	---	---	3.8	4.2
LzD3------------- Lybrand	6e	---	---	---	3.4	4.0
MaB-------------- Martinsville	2e	115	40	50	4.0	4.5
MbB-------------- Martinsville	2e	115	40	50	4.0	4.5
McD2------------- Mentor	4e	---	---	---	3.7	4.5
MfA-------------- Millgrove	2w	155	55	60	4.5	5.3

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay	Bluegrass-ladino
		Bu	Bu	Bu	Tons	AUM*
MgA: Millgrove	2w	150	55	60	4.5	5.3
MhA: Millgrove	2w	145	50	55	4.0	5.0
MoB: Milton	2e	100	32	40	3.5	3.8
MoC2: Milton	3e	80	25	35	3.5	3.5
MpD2: Milton-Lybrand	4e	---	---	---	3.4	3.8
PaA: Pacer	1	125	45	55	4.5	4.5
PwA: Pewamo	2w	140	44	55	5.0	5.3
Pz. Pits						
RdB2: Rarden	3e	92	28	32	3.5	4.0
RdC2: Rarden	4e	87	25	30	3.0	3.8
RdF2: Rarden	7e	---	---	---	---	---
RoA: Rossburg	2w	125	40	50	4.5	5.0
RsA: Rossburg-Sloan	2w	121	40	46	4.3	5.0
ScA: Scioto	2s	95	30	40	3.5	4.0
ScB: Scioto	2e	90	30	40	3.5	4.0
SdC2: Scioto	3e	75	25	30	3.0	3.8
SfA: Scioto	2s	95	30	40	3.5	4.0
SgA: Shoals	2w	115	40	47	4.1	4.8

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay	Bluegrass-ladino
		Bu	Bu	Bu	Tons	AUM*
SkA-------------- Sloan	3w	115	40	42	4.0	5.0
SnA-------------- Sloan	3w	115	40	42	4.0	5.0
SoA-------------- Sloan	3w	110	38	40	4.0	5.0
SsA-------------- Smothers	2w	100	35	40	4.0	5.0
SsB-------------- Smothers	2e	95	32	40	4.0	5.0
StA-------------- Stone	2w	115	44	50	4.5	5.0
SuA-------------- Stone	2w	115	44	50	4.5	5.0
Uc. Udorthents						
UdB. Udorthents-Urban land						
Up. Udorthents-Pits						

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 6.--Yield Index

(See text for an explanation of the ratings in this table. An asterisk indicates that the map unit is not rated for crop production but is rated only on the basis of estimated combined yields for bluegrass-ladino pasture and orchardgrass-alfalfa hay. Absence of an entry indicates that the map unit is not used for any type of crop production)

Map symbol and soil name	Yield index
AmD2:	
Amanda	8.0*
AmE:	
Amanda	8.0*
AmF:	
Amanda.	
BeA:	
Bennington	76
BeB:	
Bennington	69
BoA:	
Blount	76
BoB:	
Blount	69
CaB:	
Cardington	70
CaC2:	
Cardington	62
CeB:	
Centerburg	73
CeC2:	
Centerburg	64
CnA:	
Condit	65
EdA:	
Edwards.	
GaC2:	
Gallman	61
GbA:	
Gallman	81
GbB:	
Gallman	74
GcB:	
Gallman	74
GwB:	
Glynwood	70

Table 6.--Yield Index--Continued

Map symbol and soil name	Yield index
GwC2:	
Glynwood	62
GzC3:	
Glynwood	44
HeF:	
Heverlo.	
HyA:	
Hyatts	70
HyB:	
Hyatts	64
JmA:	
Jimtown	73
LbF:	
Latham-Brecksville.	
LeE:	
Leoni	4.5*
LoA:	
Lobdell	78
LsA:	
Lobdell-Sloan	76
LvB:	
Loudonville	62
LyD2:	
Lybrand	8.3*
LyE2:	
Lybrand	8.0*
LzD3:	
Lybrand	7.4*
MaB:	
Martinsville	76
MbB:	
Martinsville	76
McD2:	
Mentor	8.2*
MfA:	
Millgrove	100
MgA:	
Millgrove	98
MhA:	
Millgrove	93
MoB:	
Milton	64

Table 6.--Yield Index--Continued

Map symbol and soil name	Yield index
MoC2:	
Milton	52
MpD2:	
Milton-Lybrand	7.2*
PaA:	
Pacer	83
PwA:	
Pewamo	89
Pz:	
Pits.	
RdB2:	
Rarden	56
RdC2:	
Rarden	53
RdF2:	
Rarden.	
RoA:	
Rossburg	80
RsA:	
Rossburg-Sloan	77
ScA:	
Scioto	61
ScB:	
Scioto	59
SdC2:	
Scioto	48
SfA:	
Scioto	61
SgA:	
Shoals	75
SkA:	
Sloan	73
SnA:	
Sloan	73
SoA:	
Sloan	70
SsA:	
Smothers	65
SsB:	
Smothers	62
StA:	
Stone	77

Table 6.--Yield Index--Continued

Map symbol and soil name	Yield index
SuA:	
Stone	77
Uc:	
Udorthents.	
UdB:	
Udorthents-Urban land.	
Up:	
Udorthents-Pits.	

Table 7.--Main Cropland Limitations and Hazards

(Only the soils used for crop production are listed. See text for descriptions of the limitations and hazards listed in this table)

Map symbol and soil name	Cropland limitations or hazards
AmD2:	
Amanda	Easily eroded Slope Part of surface layer removed Surface compaction Fair tilth Surface crusting Limited organic matter content
AmE:	
Amanda	Easily eroded Slope Surface compaction Surface crusting Limited organic matter content
BeA:	
Bennington	High bulk density in the substratum Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
BeB:	
Bennington	High bulk density in the substratum Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
BoA:	
Blount	High bulk density in the substratum Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
BoB:	
Blount	High bulk density in the substratum Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
CaB:	
Cardington	Easily eroded High bulk density in the substratum Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave

Table 7.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
CaC2:	
Cardington	Easily eroded Part of surface layer removed High bulk density in the substratum Seasonal high water table Surface compaction Fair tilth Surface crusting Limited organic matter content Frost heave
CeB:	
Centerburg	Easily eroded Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
CeC2:	
Centerburg	Easily eroded Part of surface layer removed Seasonal high water table Surface compaction Fair tilth Surface crusting Limited organic matter content Frost heave
CnA:	
Condit	Ponding High bulk density in the substratum Surface compaction Surface crusting Limited organic matter content Frost heave
GaC2:	
Gallman	Moderate potential for ground-water pollution Easily eroded Part of surface layer removed Fair tilth Limited organic matter content
GbA:	
Gallman	Moderate potential for ground-water pollution Surface compaction Surface crusting Limited organic matter content
GbB:	
Gallman	Moderate potential for ground-water pollution Surface compaction Surface crusting Limited organic matter content
GcB:	
Gallman	Easily eroded Surface compaction Surface crusting Limited organic matter content

Table 7.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
GwB:	
Glynwood	Easily eroded
	High bulk density in the substratum
	Limited available water capacity
	Seasonal high water table
	Surface compaction
	Surface crusting
	Limited organic matter content
	Frost heave
GwC2:	
Glynwood	Easily eroded
	Part of surface layer removed
	High bulk density in the substratum
	Limited available water capacity
	Seasonal high water table
	Surface compaction
	Fair tilth
	Surface crusting
	Limited organic matter content
	Frost heave
GzC3:	
Glynwood	Easily eroded
	Most of surface layer removed
	High bulk density in the substratum
	Limited available water capacity
	Seasonal high water table
	Surface compaction
	Poor tilth
	Surface crusting
	Limited organic matter content
	Frost heave
HyA:	
Hyatts	High potential for ground-water pollution
	Seasonal high water table
	Surface compaction
	Surface crusting
	Limited organic matter content
	Frost heave
HyB:	
Hyatts	High potential for ground-water pollution
	Seasonal high water table
	Surface compaction
	Surface crusting
	Limited organic matter content
	Frost heave
JmA:	
Jimtown	High potential for ground-water pollution
	Seasonal high water table
	Surface compaction
	Surface crusting
	Limited organic matter content
	Frost heave
LeE:	
Leoni	High potential for ground-water pollution
	Easily eroded
	Slope
	Limited available water capacity
	Limited organic matter content

Table 7.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
LoA:	
Lobdell	Occasional flooding High potential for ground-water pollution Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
LsA:	
Lobdell	Occasional flooding High potential for ground-water pollution Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
Sloan	Ponding Occasional flooding High potential for ground-water pollution Surface compaction Frost heave
LvB:	
Loudonville	High potential for ground-water pollution Easily eroded Limited available water capacity Depth to rock Surface compaction Surface crusting Limited organic matter content
LyD2:	
Lybrand	Easily eroded Slope Part of surface layer removed High bulk density in the substratum Surface compaction Fair tilth Surface crusting Limited organic matter content Frost heave
LyE2:	
Lybrand	Easily eroded Slope Part of surface layer removed High bulk density in the substratum Surface compaction Fair tilth Surface crusting Limited organic matter content Frost heave

Table 7.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
LzD3:	
Lybrand	Easily eroded
	Slope
	Most of surface layer removed
	High bulk density in the substratum
	Limited available water capacity
	Surface compaction
	Poor tilth
	Surface crusting
	Limited organic matter content
	Frost heave
MaB:	
Martinsville	Easily eroded
	Limited organic matter content
MbB:	
Martinsville	Easily eroded
	Limited organic matter content
McD2:	
Mentor	Easily eroded
	Slope
	Part of surface layer removed
	Surface compaction
	Fair tilth
	Surface crusting
	Limited organic matter content
	Frost heave
MfA:	
Millgrove	Ponding
	High potential for ground-water pollution
	Surface compaction
	Frost heave
MgA:	
Millgrove	Ponding
	High potential for ground-water pollution
	Surface compaction
	Fair tilth
	Frost heave
MhA:	
Millgrove	Ponding
	Rare flooding
	High potential for ground-water pollution
	Surface compaction
	Fair tilth
	Frost heave
MoB:	
Milton	High potential for ground-water pollution
	Easily eroded
	Limited available water capacity
	Depth to rock
	Surface compaction
	Surface crusting
	Limited organic matter content

Table 7.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
MoC2:	
Milton	High potential for ground-water pollution
	Easily eroded
	Part of surface layer removed
	Limited available water capacity
	Depth to rock
	Surface compaction
	Fair tilth
	Surface crusting
	Limited organic matter content
MpD2:	
Milton	High potential for ground-water pollution
	Easily eroded
	Slope
	Part of surface layer removed
	Limited available water capacity
	Depth to rock
	Surface compaction
	Fair tilth
	Surface crusting
	Limited organic matter content
Lybrand	Easily eroded
	Slope
	Part of surface layer removed
	High bulk density in the substratum
	Surface compaction
	Fair tilth
	Surface crusting
	Limited organic matter content
	Frost heave
PaA:	
Pacer	Surface compaction
PwA:	
Pewamo	Ponding
	High potential for ground-water pollution
	Surface compaction
	Fair tilth
	Frost heave
RdB2:	
Rarden	High potential for ground-water pollution
	Easily eroded
	Part of surface layer removed
	Limited available water capacity
	Depth to rock
	Seasonal high water table
	Surface compaction
	Fair tilth
	Surface crusting
	Limited organic matter content
	Frost heave

Table 7.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
RdC2:	
Rarden	High potential for ground-water pollution Easily eroded Slope Part of surface layer removed Limited available water capacity Depth to rock Seasonal high water table Surface compaction Fair tilth Surface crusting Limited organic matter content Frost heave
RoA:	
Rossburg	Occasional flooding Surface compaction
RsA:	
Rossburg	Occasional flooding Surface compaction
Sloan	Ponding Occasional flooding High potential for ground-water pollution Surface compaction Frost heave
ScA:	
Scioto	Limited available water capacity Surface compaction Surface crusting Limited organic matter content
ScB:	
Scioto	Easily eroded Limited available water capacity Surface compaction Surface crusting Limited organic matter content
SdC2:	
Scioto	Easily eroded Part of surface layer removed Limited available water capacity Surface compaction Fair tilth Surface crusting Limited organic matter content
SfA:	
Scioto	Rare flooding Limited available water capacity Surface compaction Surface crusting Limited organic matter content

Table 7.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
SgA:	
Shoals	Occasional flooding High potential for ground-water pollution Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
SkA:	
Sloan	Ponding Occasional flooding High potential for ground-water pollution Surface compaction Frost heave
SnA:	
Sloan	Ponding Occasional flooding High potential for ground-water pollution Surface compaction Frost heave
SoA:	
Sloan	Ponding Occasional flooding High potential for ground-water pollution Surface compaction Fair tilth Frost heave
SsA:	
Smothers	High potential for ground-water pollution Limited available water capacity Depth to rock Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
SsB:	
Smothers	High potential for ground-water pollution Limited available water capacity Depth to rock Seasonal high water table Surface compaction Surface crusting Limited organic matter content Frost heave
StA:	
Stone	High potential for ground-water pollution Seasonal high water table Surface compaction Fair tilth Frost heave

Table 7.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
SuA:	
Stone	Rare flooding
	High potential for ground-water pollution
	Seasonal high water table
	Surface compaction
	Fair tilth
	Frost heave

Table 8.--Capability Classes and Subclasses

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
1	1,110	---	---	---
2	236,776	92,346	143,176	1,254
3	14,058	7,182	6,876	---
4	12,338	12,338	---	---
5	20	---	20	---
6	3,170	3,170	---	---
7	2,110	2,110	---	---
8	---	---	---	---

Table 9.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
BeA	Bennington silt loam, 0 to 2 percent slopes (where drained)
BeB	Bennington silt loam, 2 to 4 percent slopes (where drained)
BoA	Blount silt loam, 0 to 2 percent slopes (where drained)
BoB	Blount silt loam, 2 to 4 percent slopes (where drained)
CaB	Cardington silt loam, 2 to 6 percent slopes
CeB	Centerburg silt loam, 2 to 6 percent slopes
CnA	Condit silt loam, 0 to 1 percent slopes (where drained)
GbA	Gallman silt loam, loamy substratum, 0 to 2 percent slopes
GbB	Gallman silt loam, loamy substratum, 2 to 6 percent slopes
GcB	Gallman silt loam, till substratum, 2 to 6 percent slopes
GwB	Glynwood silt loam, 2 to 6 percent slopes
HyA	Hyatts silt loam, 0 to 2 percent slopes (where drained)
HyB	Hyatts silt loam, 2 to 4 percent slopes (where drained)
JmA	Jimtown silt loam, 0 to 2 percent slopes (where drained)
LoA	Lobdell silt loam, channery substratum, 0 to 2 percent slopes, occasionally flooded
LsA	Lobdell, channery substratum-Sloan, till substratum complex, 0 to 2 percent slopes, occasionally flooded
LvB	Loudonville silt loam, 2 to 6 percent slopes
MaB	Martinsville loam, 2 to 6 percent slopes
MbB	Martinsville loam, till substratum, 2 to 6 percent slopes
MfA	Millgrove silt loam, 0 to 2 percent slopes (where drained)
MgA	Millgrove silty clay loam, 0 to 2 percent slopes (where drained)
MhA	Millgrove silty clay loam, 0 to 2 percent slopes, rarely flooded (where drained)
MoB	Milton silt loam, 2 to 6 percent slopes
PaA	Pacer silt loam, 0 to 2 percent slopes
PwA	Pewamo silty clay loam, 0 to 1 percent slopes (where drained)
RdB2	Rarden silt loam, 2 to 6 percent slopes, eroded
RoA	Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded
RsA	Rossburg-Sloan complex, 0 to 2 percent slopes, occasionally flooded
ScA	Scioto silt loam, 0 to 2 percent slopes
ScB	Scioto silt loam, 2 to 6 percent slopes
SfA	Scioto silt loam, 0 to 2 percent slopes, rarely flooded
SgA	Shoals silt loam, 0 to 2 percent slopes, occasionally flooded (where drained)
SkA	Sloan silt loam, 0 to 2 percent slopes, occasionally flooded (where drained)
SnA	Sloan silt loam, till substratum, 0 to 2 percent slopes, occasionally flooded (where drained)
SoA	Sloan silty clay loam, till substratum, 0 to 2 percent slopes, occasionally flooded (where drained)
SsA	Smothers silt loam, 0 to 2 percent slopes (where drained)
SsB	Smothers silt loam, 2 to 4 percent slopes (where drained)
StA	Stone silty clay loam, 0 to 2 percent slopes (where drained)
SuA	Stone clay loam, 0 to 2 percent slopes, rarely flooded (where drained)

Table 10.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Suggested trees to plant
AmD2:										
Amanda	5R	Moderate	Moderate	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Black walnut	---	---	
							Northern red oak	87	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	---	---	
AmE:										
Amanda	5R	Moderate	Moderate	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Black walnut	---	---	
							Northern red oak	87	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	---	---	
AmF:										
Amanda	5R	Severe	Severe	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Black walnut	---	---	
							Northern red oak	87	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	---	---	
BeA:										
Bennington	4A	Slight	Slight	Moderate	Moderate	Severe	Black cherry	---	---	American sycamore, black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
							Northern red oak	80	57	
							Sugar maple	---	---	
							Tuliptree	90	86	
							White ash	---	---	
							White oak	---	---	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Suggested trees to plant
BeB:										
Bennington	4A	Slight	Slight	Moderate	Moderate	Severe	Black cherry	---	---	American sycamore, black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
							Northern red oak	80	57	
							Sugar maple	---	---	
							Tuliptree	90	86	
							White ash	---	---	
							White oak	---	---	
BoA:										
Blount	3C	Slight	Slight	Moderate	Moderate	Severe	Bur oak	---	---	American sycamore, black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
							Northern red oak	65	43	
							Pin oak	---	---	
							Sugar maple	---	---	
							White ash	---	---	
							White oak	65	43	
BoB:										
Blount	3C	Slight	Slight	Moderate	Moderate	Severe	Bur oak	---	---	American sycamore, black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
							Northern red oak	65	43	
							Pin oak	---	---	
							Sugar maple	---	---	
							White ash	---	---	
							White oak	65	43	
CaB:										
Cardington	4A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree, white ash, white oak.
							Northern red oak	80	57	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	75	57	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Suggested trees to plant
CaC2:										
Cardington	4A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree, white ash, white oak.
							Northern red oak	80	57	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	75	57	
CeB:										
Centerburg	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree, white ash, white oak.
							Northern red oak	89	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	---	---	
CeC2:										
Centerburg	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree, white ash, white oak.
							Northern red oak	89	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	---	---	
CnA:										
Condit	5W	Slight	Severe	Severe	Severe	Severe	Black cherry	---	---	American sycamore, eastern cottonwood, green ash, pin oak, Norway spruce, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Eastern cottonwood	---	---	
							Green ash	---	---	
							Pin oak	90	72	
							Red maple	---	---	
							Swamp white oak	---	---	
EdA:										
Edwards	2W	Slight	Severe	Severe	Severe	Severe	Black willow	---	---	Baldcypress, eastern cottonwood, green ash, northern whitecedar, red maple, silver maple, white ash.
							Quaking aspen	56	40	
							Red maple	51	40	
							Silver maple	76	50	
							White ash	51	40	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Suggested trees to plant
GaC2:										
Gallman	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, northern red oak, sugar maple, tuliptree, white ash, white oak.
							Black walnut	---	---	
							Northern red oak	90	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	85	72	
GbA:										
Gallman	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, northern red oak, sugar maple, tuliptree, white ash, white oak.
							Black walnut	---	---	
							Northern red oak	90	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	85	72	
GbB:										
Gallman	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, northern red oak, sugar maple, tuliptree, white ash, white oak.
							Black walnut	---	---	
							Northern red oak	90	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	85	72	
GcB:										
Gallman	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, northern red oak, sugar maple, tuliptree, white ash, white oak.
							Black walnut	---	---	
							Northern red oak	90	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	85	72	
GwB:										
Glynwood	4C	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree, white ash, white oak.
							Black oak	80	57	
							Northern red oak	80	57	
							Red maple	---	---	
							Slippery elm	---	---	
							White ash	---	---	
							White oak	80	57	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Suggested trees to plant
GwC2:										
Glynwood-------	4C	Slight	Slight	Slight	Slight	Severe	Black cherry--------	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree, white ash, white oak.
							Black oak-----------	80	57	
							Northern red oak----	80	57	
							Red maple-----------	---	---	
							Slippery elm--------	---	---	
							White ash-----------	---	---	
							White oak-----------	80	57	
GzC3:										
Glynwood-------	4C	Slight	Slight	Moderate	Slight	Severe	Black cherry--------	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree, white ash, white oak.
							Black oak-----------	80	57	
							Northern red oak----	80	57	
							Red maple-----------	---	---	
							Slippery elm--------	---	---	
							White ash-----------	---	---	
							White oak-----------	80	57	
HeF:										
Heverlo--------	4R	Severe	Severe	Slight	Slight	Severe	Black cherry--------	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Black walnut--------	---	---	
							Northern red oak----	70	57	
							Sugar maple---------	---	---	
							Tuliptree-----------	---	---	
							White ash-----------	---	---	
							White oak-----------	---	---	
HyA:										
Hyatts---------	4A	Slight	Slight	Moderate	Moderate	Severe	Black cherry--------	---	---	American sycamore, black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
							Northern red oak----	80	57	
							Sugar maple---------	---	---	
							Tuliptree-----------	90	86	
							White ash-----------	---	---	
							White oak-----------	---	---	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Suggested trees to plant
HyB:										
Hyatts	4A	Slight	Slight	Moderate	Moderate	Severe	Black cherry	---	---	American
							Northern red oak	80	57	sycamore,
							Sugar maple	---	---	black oak,
							Tuliptree	90	86	eastern
							White ash	---	---	cottonwood,
							White oak	---	---	eastern
										redcedar,
										green ash,
										northern red
										oak, pin oak,
										red maple,
										silver maple,
										swamp white
										oak.
JmA:										
Jimtown	5A	Slight	Slight	Moderate	Moderate	Severe	Black cherry	---	---	Black cherry,
							Northern red oak	85	72	black walnut,
							Sugar maple	---	---	eastern white
							Tuliptree	---	---	pine, green
							White ash	---	---	ash, northern
							White oak	---	---	red oak,
										Norway spruce,
										pin oak,
										tuliptree,
										white ash,
										white oak.
LbF:										
Latham	3R	Severe	Severe	Severe	Moderate	Moderate	Black oak	---	---	Black cherry,
							Northern red oak	59	43	black walnut,
							Virginia pine	---	---	eastern white
							White oak	---	---	pine, green
										ash, northern
										red oak,
										Norway spruce,
										tuliptree,
										white oak.
Brecksville	3R	Severe	Severe	Severe	Moderate	Moderate	Black cherry	---	---	Black cherry,
							Black oak	71	57	black walnut,
							Green ash	---	---	eastern white
							Northern red oak	60	50	pine, green
							Shagbark hickory	---	---	ash, northern
							Tuliptree	---	---	red oak,
							White oak	55	50	Norway spruce,
										tuliptree,
										white oak.
LeE:										
Leoni	4R	Moderate	Moderate	Slight	Slight	Moderate	American basswood	---	---	Black cherry,
							Black cherry	---	---	black walnut,
							Black walnut	---	---	eastern white
							Northern red oak	65	57	pine, green
							Sugar maple	---	---	ash, northern
							White ash	---	---	red oak,
							White oak	---	---	Norway spruce,
										tuliptree,
										white oak.

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordi-nation symbol	Management concerns: Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Wind-throw hazard	Plant competi-tion	Potential productivity: Common trees	Site index	Volume*	Suggested trees to plant
LoA:										
Lobdell	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, pin oak, tuliptree, white ash, white oak.
							Northern red oak	87	72	
							Sugar maple	---	---	
							Tuliptree	96	86	
							White ash	---	---	
							White oak	---	---	
LsA:										
Lobdell	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, pin oak, tuliptree, white ash, white oak.
							Northern red oak	87	72	
							Sugar maple	---	---	
							Tuliptree	96	86	
							White ash	---	---	
							White oak	---	---	
Sloan	5W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, Norway spruce, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	---	---	
LvB:										
Loudonville	4D	Slight	Slight	Slight	Moderate	Severe	Black cherry	---	---	American basswood, black walnut, eastern redcedar, eastern white pine, northern red oak, white ash, white oak.
							Black oak	---	---	
							Black walnut	---	---	
							Northern red oak	80	57	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	75	57	
LyD2:										
Lybrand	4R	Moderate	Moderate	Slight	Slight	Severe	Black walnut	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Bur oak	---	---	
							Northern red oak	80	72	
							Shagbark hickory	---	---	
							Tuliptree	90	86	
							White oak	80	57	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	Suggested trees to plant
		Management concerns					Potential productivity			
LyE2:										
Lybrand--------	4R	Moderate	Moderate	Slight	Slight	Severe	Black walnut--------	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Bur oak------------	---	---	
							Northern red oak----	80	72	
							Shagbark hickory----	---	---	
							Tuliptree-----------	90	86	
							White oak-----------	80	57	
LzD3:										
Lybrand--------	4R	Moderate	Moderate	Moderate	Slight	Moderate	Black walnut--------	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Bur oak------------	---	---	
							Northern red oak----	80	72	
							Shagbark hickory----	---	---	
							Tuliptree-----------	90	86	
							White oak-----------	80	57	
MaB:										
Martinsville---	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak----	90	72	Black cherry, black walnut, eastern white pine, northern red oak, sugar maple, tuliptree, white ash, white oak.
							Sweetgum-----------	76	72	
							Tuliptree-----------	98	100	
							White oak-----------	90	72	
MbB:										
Martinsville---	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak----	90	72	Black cherry, black walnut, eastern white pine, northern red oak, sugar maple, tuliptree, white ash, white oak.
							Sweetgum-----------	76	72	
							Tuliptree-----------	98	100	
							White oak-----------	90	72	
McD2:										
Mentor---------	5R	Moderate	Moderate	Slight	Slight	Severe	Black cherry--------	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Black walnut--------	---	---	
							Northern red oak----	86	72	
							Sugar maple---------	---	---	
							Tuliptree-----------	---	---	
							White ash-----------	---	---	
							White oak-----------	---	---	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Suggested trees to plant
MfA:										
Millgrove	5W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, Norway spruce, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	85	72	
MgA:										
Millgrove	5W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, Norway spruce, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	85	72	
MhA:										
Millgrove	5W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, Norway spruce, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	85	72	
MoB:										
Milton	4D	Slight	Slight	Slight	Moderate	Moderate	Black cherry	---	---	American basswood, black walnut, eastern redcedar, eastern white pine, northern red oak, white ash, white oak.
							Black walnut	---	---	
							Northern red oak	80	57	
							Sugar maple	---	---	
							Tuliptree	95	100	
							White ash	---	---	
							White oak	---	---	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Suggested trees to plant
MoC2:										
Milton	4D	Slight	Slight	Slight	Moderate	Moderate	Black cherry	---	---	American basswood, black walnut, eastern redcedar, eastern white pine, northern red oak, white ash, white oak.
							Black walnut	---	---	
							Northern red oak	80	57	
							Sugar maple	---	---	
							Tuliptree	95	100	
							White ash	---	---	
							White oak	---	---	
MpD2:										
Milton	4R	Moderate	Moderate	Slight	Moderate	Moderate	Black cherry	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Black walnut	---	---	
							Northern red oak	80	57	
							Sugar maple	---	---	
							Tuliptree	95	100	
							White ash	---	---	
							White oak	---	---	
Lybrand	4R	Moderate	Moderate	Slight	Slight	Severe	Black walnut	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Bur oak	---	---	
							Northern red oak	80	57	
							Shagbark hickory	---	---	
							Tuliptree	90	86	
							White oak	80	57	
PaA:										
Pacer	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, pin oak, tuliptree, white ash, white oak.
							Black walnut	---	---	
							Northern red oak	90	72	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	90	72	
PwA:										
Pewamo	5W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	98	129	American sycamore, eastern cottonwood, green ash, Norway spruce, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Green ash	---	---	
							Pin oak	90	72	
							Red maple	71	43	
							Swamp white oak	---	---	
							White ash	71	72	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Suggested trees to plant
RdB2:										
Rarden---------	4C	Slight	Slight	Moderate	Slight	Moderate	Black oak-----------	71	57	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree, white ash, white oak.
							Northern red oak----	62	43	
							Red maple-----------	---	---	
							Slippery elm--------	---	---	
							White ash-----------	---	---	
RdC2:										
Rarden---------	4C	Slight	Slight	Moderate	Slight	Moderate	Black oak-----------	71	57	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree, white ash, white oak.
							Northern red oak----	62	43	
							Red maple-----------	---	---	
							Slippery elm--------	---	---	
							White ash-----------	---	---	
RdF2:										
Rarden---------	3R	Severe	Severe	Severe	Slight	Moderate	Black cherry--------	---	---	Black cherry, black walnut, eastern white pine, green ash, northern red oak, Norway spruce, tuliptree, white oak.
							Northern red oak----	58	43	
							Red maple-----------	---	---	
							Slippery elm--------	---	---	
							White ash-----------	---	---	
RoA:										
Rossburg-------	5A	Slight	Slight	Slight	Slight	Severe	Black cherry--------	---	---	Black cherry, black walnut, eastern white pine, northern red oak, sugar maple, tuliptree, white ash, white oak.
							Black walnut--------	---	---	
							Northern red oak----	---	---	
							Sugar maple---------	---	---	
							Tuliptree-----------	---	---	
							White ash-----------	---	---	
							White oak-----------	90	72	
RsA:										
Rossburg-------	5A	Slight	Slight	Slight	Slight	Severe	Black cherry--------	---	---	Black cherry, black walnut, eastern white pine, northern red oak, sugar maple, tuliptree, white ash, white oak.
							Black walnut--------	---	---	
							Northern red oak----	---	---	
							Sugar maple---------	---	---	
							Tuliptree-----------	---	---	
							White ash-----------	---	---	
							White oak-----------	90	72	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Suggested trees to plant
RsA:										
Sloan	5W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, Norway spruce, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	---	---	
ScA:										
Scioto	4F	Slight	Slight	Slight	Slight	Moderate	Black cherry	---	---	Black cherry, black walnut, eastern white pine, Norway spruce, sugar maple, tuliptree, white ash.
							Black oak	---	---	
							Northern red oak	70	57	
							Red maple	---	---	
							Scarlet oak	---	---	
							Tuliptree	---	---	
							White oak	70	57	
ScB:										
Scioto	4F	Slight	Slight	Slight	Slight	Moderate	Black cherry	---	---	Black cherry, black walnut, eastern white pine, Norway spruce, sugar maple, tuliptree, white ash.
							Black oak	---	---	
							Northern red oak	70	57	
							Red maple	---	---	
							Scarlet oak	---	---	
							Tuliptree	---	---	
							White oak	70	57	
SdC2:										
Scioto	4F	Slight	Slight	Moderate	Slight	Moderate	Black cherry	---	---	Black cherry, black walnut, eastern white pine, Norway spruce, sugar maple, tuliptree, white ash.
							Black oak	---	---	
							Northern red oak	70	57	
							Red maple	---	---	
							Scarlet oak	---	---	
							Tuliptree	---	---	
							White oak	70	57	
SfA:										
Scioto	4F	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Black cherry, black walnut, eastern white pine, Norway spruce, sugar maple, tuliptree, white ash.
							Black oak	---	---	
							Northern red oak	70	57	
							Red maple	---	---	
							Scarlet oak	---	---	
							Tuliptree	---	---	
							White oak	70	57	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Suggested trees to plant
SgA:										
Shoals	5W	Slight	Moderate	Moderate	Moderate	Severe	Eastern cottonwood	---	---	American sycamore, eastern cottonwood, pin oak, red maple, swamp white oak, sweetgum, tuliptree.
							Pin oak	90	72	
							Sweetgum	86	100	
							Tuliptree	90	86	
							Virginia pine	90	129	
							White ash	---	---	
SkA:										
Sloan	5W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, Norway spruce, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	---	---	
SnA:										
Sloan	5W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, Norway spruce, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	---	---	
SoA:										
Sloan	5W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, Norway spruce, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	---	---	

See footnote at end of table.

Table 10.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Suggested trees to plant
SsA: Smothers	4D	Slight	Slight	Moderate	Moderate	Severe	Black cherry	---	---	American sycamore, black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
							Northern red oak	70	57	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	---	---	
SsB: Smothers	4D	Slight	Slight	Moderate	Moderate	Severe	Black cherry	---	---	American sycamore, black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
							Northern red oak	70	57	
							Sugar maple	---	---	
							Tuliptree	---	---	
							White ash	---	---	
							White oak	---	---	
StA: Stone	5W	Slight	Severe	Moderate	Moderate	Severe	Black cherry	---	---	American sycamore, eastern cottonwood, pin oak, red maple, swamp white oak, sweetgum, tuliptree.
							Eastern cottonwood	---	---	
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	---	---	
SuA: Stone	5W	Slight	Severe	Moderate	Moderate	Severe	Black cherry	---	---	American sycamore, eastern cottonwood, pin oak, red maple, swamp white oak, sweetgum, tuliptree.
							Eastern cottonwood	---	---	
							Green ash	---	---	
							Pin oak	86	72	
							Red maple	---	---	
							Swamp white oak	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of the mean annual increment for fully stocked natural stands.

Table 11.--Windbreaks and Environmental Plantings

(Only the soils suitable for windbreaks and environmental plantings are listed. Absence of an entry indicates that trees generally do not grow to the given height on that soil)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
AmD2: Amanda	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
AmE: Amanda	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
AmF: Amanda	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
BeA: Bennington	Silky dogwood, southern arrowwood.	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar.	Green ash, osageorange, Austrian pine, Norway spruce, northern whitecedar.	Shumard's oak, pin oak.	Swamp white oak.
BeB: Bennington	Silky dogwood, southern arrowwood.	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar.	Green ash, osageorange, Austrian pine, Norway spruce, northern whitecedar.	Shumard's oak, pin oak.	Swamp white oak.
BoA: Blount	Silky dogwood, southern arrowwood.	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar.	Green ash, osageorange, Austrian pine, Norway spruce, northern whitecedar.	Shumard's oak, pin oak.	Swamp white oak.

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
BoB: Blount	Silky dogwood, southern arrowwood.	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar.	Green ash, osageorange, Austrian pine, Norway spruce, northern whitecedar.	Shumard's oak, pin oak.	Swamp white oak.
CaB: Cardington	American cranberrybush, blackhaw.	Southern arrowwood, Washington hawthorn, eastern redcedar.	Baldcypress, osageorange, Austrian pine, northern whitecedar.	Norway spruce, green ash, black oak, pin oak.	Northern red oak.
CaC2: Cardington	American cranberrybush, blackhaw.	Southern arrowwood, Washington hawthorn, eastern redcedar.	Baldcypress, osageorange, Austrian pine, northern whitecedar.	Norway spruce, green ash, black oak, pin oak.	Northern red oak.
CeB: Centerburg	American cranberrybush, blackhaw.	Southern arrowwood, Washington hawthorn, eastern redcedar.	Baldcypress, osageorange, Austrian pine, northern whitecedar.	Norway spruce, green ash, black oak, pin oak.	Northern red oak.
CeC2: Centerburg	American cranberrybush, blackhaw.	Southern arrowwood, Washington hawthorn, eastern redcedar.	Baldcypress, osageorange, Austrian pine, northern whitecedar.	Norway spruce, green ash, black oak, pin oak.	Northern red oak.
CnA: Condit	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
EdA: Edwards	Common ninebark, silky dogwood.	Nannyberry	Black willow	---	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
GaC2: Gallman	Japanese tree lilac, Siberian peashrub, redbud.	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar.	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, northern whitecedar.	White oak, white spruce.	Northern red oak, white ash, eastern white pine.
GbA: Gallman	Japanese tree lilac, Siberian peashrub, redbud.	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar.	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, northern whitecedar.	White oak, white spruce.	Northern red oak, white ash, eastern white pine.
GbB: Gallman	Japanese tree lilac, Siberian peashrub, redbud.	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar.	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, northern whitecedar.	White oak, white spruce.	Northern red oak, white ash, eastern white pine.
GcB: Gallman	Japanese tree lilac, Siberian peashrub, redbud.	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar.	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, northern whitecedar.	White oak, white spruce.	Northern red oak, white ash, eastern white pine.
GwB: Glynwood	American cranberrybush, blackhaw.	Southern arrowwood, Washington hawthorn, eastern redcedar.	Baldcypress, osageorange, Austrian pine, northern whitecedar.	Norway spruce, green ash, black oak, pin oak.	Northern red oak.
GwC2: Glynwood	American cranberrybush, blackhaw.	Southern arrowwood, Washington hawthorn, eastern redcedar.	Baldcypress, osageorange, Austrian pine, northern whitecedar.	Norway spruce, green ash, black oak, pin oak.	Northern red oak.

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
GzC3:					
Glynwood	American cranberrybush, blackhaw.	Southern arrowwood, Washington hawthorn, eastern redcedar.	Baldcypress, osageorange, Austrian pine, northern whitecedar.	Norway spruce, green ash, black oak, pin oak.	Northern red oak.
HeF:					
Heverlo	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
HyA:					
Hyatts	Silky dogwood, southern arrowwood.	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar.	Green ash, osageorange, Austrian pine, Norway spruce, northern whitecedar.	Shumard's oak, pin oak.	Swamp white oak.
HyB:					
Hyatts	Silky dogwood, southern arrowwood.	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar.	Green ash, osageorange, Austrian pine, Norway spruce, northern whitecedar.	Shumard's oak, pin oak.	Swamp white oak.
JmA:					
Jimtown	Silky dogwood	American cranberrybush, European alder, Washington hawthorn.	White fir, baldcypress, blue spruce, eastern redcedar, northern whitecedar.	Austrian pine, Norway spruce, green ash, pin oak.	Eastern white pine.
LbF:					
Latham	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
Brecksville	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
LeE:					
Leoni	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
LoA:					
Lobdell	Silky dogwood	American cranberrybush, blackhaw, European alder, Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, blue spruce, northern whitecedar.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
LsA:					
Lobdell	Silky dogwood	American cranberrybush, blackhaw, European alder, Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, blue spruce, northern whitecedar.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
Sloan	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
LvB:					
Loudonville	Japanese tree lilac, Siberian peashrub, redbud.	Washington hawthorn, eastern redcedar, radiant crabapple.	Austrian pine, osageorange, eastern white pine.	---	---
LyD2:					
Lybrand	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
LyE2:					
Lybrand	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
LzD3:					
Lybrand	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
MaB:					
Martinsville	Japanese tree lilac, Siberian peashrub, redbud.	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar.	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, northern whitecedar.	White oak, white spruce.	Northern red oak, white ash, eastern white pine.
MbB:					
Martinsville	Japanese tree lilac, Siberian peashrub, redbud.	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar.	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, northern whitecedar.	White oak, white spruce.	Northern red oak, white ash, eastern white pine.
McD2:					
Mentor	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
MfA:					
Millgrove	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
MgA:					
Millgrove	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
MhA:					
Millgrove	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
MoB:					
Milton	Japanese tree lilac, Siberian peashrub, redbud.	Washington hawthorn, eastern redcedar, radiant crabapple.	Austrian pine, osageorange, eastern white pine.	---	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
MoC2:					
Milton	Japanese tree lilac, Siberian peashrub, redbud.	Washington hawthorn, eastern redcedar, radiant crabapple.	Austrian pine, osageorange, eastern white pine.	---	---
MpD2:					
Milton	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
Lybrand	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.
PaA:					
Pacer	Silky dogwood	American cranberrybush, European alder, Washington hawthorn.	White fir, baldcypress, blue spruce, eastern redcedar, northern whitecedar.	Austrian pine, Norway spruce, green ash, pin oak.	Eastern white pine.
PwA:					
Pewamo	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
RdB2:					
Rarden	American cranberrybush, blackhaw.	Southern arrowwood, Washington hawthorn, eastern redcedar.	Baldcypress, osageorange, Austrian pine, northern whitecedar.	Norway spruce, green ash, black oak, pin oak.	Northern red oak.
RdC2:					
Rarden	American cranberrybush, blackhaw.	Southern arrowwood, Washington hawthorn, eastern redcedar.	Baldcypress, osageorange, Austrian pine, northern whitecedar.	Norway spruce, green ash, black oak, pin oak.	Northern red oak.
RdF2:					
Rarden	American cranberrybush.	Washington hawthorn, eastern redcedar, southern arrowwood.	Osageorange, Austrian pine.	Green ash, eastern white pine.	Northern red oak.

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
RoA:					
Rossburg	Japanese tree lilac, Siberian peashrub, redbud.	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar.	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, northern whitecedar.	White oak, white spruce.	Northern red oak, white ash, eastern white pine.
RsA:					
Rossburg	Japanese tree lilac, Siberian peashrub, redbud.	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar.	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, northern whitecedar.	White oak, white spruce.	Northern red oak, white ash, eastern white pine.
Sloan	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
ScA:					
Scioto	Redbud	American cranberrybush, Washington hawthorn.	Austrian pine, osageorange.	Northern whitecedar, Norway spruce, eastern white pine.	Northern red oak.
ScB:					
Scioto	Redbud	American cranberrybush, Washington hawthorn.	Austrian pine, osageorange.	Northern whitecedar, Norway spruce, eastern white pine.	Northern red oak.
SdC2:					
Scioto	Redbud	American cranberrybush, Washington hawthorn.	Austrian pine, osageorange.	Northern whitecedar, Norway spruce, eastern white pine.	Northern red oak.
SfA:					
Scioto	Redbud	American cranberrybush, Washington hawthorn.	Austrian pine, osageorange.	Northern whitecedar, Norway spruce, eastern white pine.	Northern red oak.

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
SgA: Shoals	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
SkA: Sloan	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
SnA: Sloan	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
SoA: Sloan	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
SsA: Smothers	Silky dogwood, southern arrowwood.	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar.	Green ash, osageorange, Austrian pine, Norway spruce, northern whitecedar.	Shumard's oak, pin oak.	Swamp white oak.

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
SsB:					
Smothers	Silky dogwood, southern arrowwood.	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar.	Green ash, osageorange, Austrian pine, Norway spruce, northern whitecedar.	Shumard's oak, pin oak.	Swamp white oak.
StA:					
Stone	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.
SuA:					
Stone	Silky dogwood	American cranberrybush, European alder, baldcypress.	Washington hawthorn, northern whitecedar, Austrian pine, eastern redcedar, green ash.	Norway spruce, swamp white oak.	Pin oak.

Table 12.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AmD2, AmE:					
Amanda	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
AmF:					
Amanda	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
BeA, BeB:					
Bennington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BoA, BoB:					
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
CaB:					
Cardington	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
CaC2:					
Cardington	Severe: wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness, slope.
CeB:					
Centerburg	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
CeC2:					
Centerburg	Severe: wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness, slope.
CnA:					
Condit	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
EdA:					
Edwards	Severe: ponding, percs slowly, excess humus.	Severe: ponding, excess humus, percs slowly.	Severe: excess humus, ponding, percs slowly.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
GaC2:					
Gallman	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope.
GbA, GbB:					
Gallman	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Slight.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GcB:					
Gallman	Slight	Slight	Moderate: slope.	Slight	Slight.
GwB:					
Glynwood	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
GwC2:					
Glynwood	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness, slope.
GzC3:					
Glynwood	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness, slope.
HeF:					
Heverlo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
HyA, HyB:					
Hyatts	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
JmA:					
Jimtown	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
LbF:					
Latham	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope, erodes easily.	Severe: slope.
Brecksville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
LeE:					
Leoni	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
LoA:					
Lobdell	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, wetness.
LsA:					
Lobdell	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, wetness.
Sloan	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
LvB:					
Loudonville	Slight	Slight	Moderate: slope, small stones, depth to rock.	Slight	Moderate: depth to rock.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LyD2, LyE2:					
Lybrand	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
LzD3:					
Lybrand	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
MaB:					
Martinsville	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
MbB:					
Martinsville	Slight	Slight	Moderate: slope.	Slight	Slight.
McD2:					
Mentor	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
MfA:					
Millgrove	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
MgA:					
Millgrove	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
MhA:					
Millgrove	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: wetness.
MoB:					
Milton	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, depth to rock.	Slight	Moderate: depth to rock.
MoC2:					
Milton	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, depth to rock.
MpD2:					
Milton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Lybrand	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
PaA:					
Pacer	Moderate: wetness.	Moderate: wetness.	Moderate: small stones, wetness.	Slight	Slight.
PwA:					
Pewamo	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Pz:					
Pits.					

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
RdB2:					
Rarden	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: depth to rock, wetness.
RdC2:					
Rarden	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: slope, depth to rock, wetness.
RdF2:					
Rarden	Severe: slope, wetness.	Severe: slope, wetness.	Severe: slope, wetness.	Severe: slope, erodes easily.	Severe: slope.
RoA:					
Rossburg	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
RsA:					
Rossburg	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
Sloan	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
ScA:					
Scioto	Moderate: percs slowly.	Moderate: percs slowly, small stones.	Moderate: small stones, percs slowly.	Slight	Slight.
ScB:					
Scioto	Moderate: percs slowly.	Moderate: percs slowly, small stones.	Moderate: slope, small stones, percs slowly.	Slight	Slight.
SdC2:					
Scioto	Moderate: slope, percs slowly.	Moderate: slope, percs slowly, small stones.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
SfA:					
Scioto	Severe: flooding.	Moderate: percs slowly, small stones.	Moderate: small stones, percs slowly.	Slight	Slight.
SgA:					
Shoals	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
SkA:					
Sloan	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
SnA:					
Sloan	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SoA:					
Sloan	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
SsA, SsB:					
Smothers	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
StA:					
Stone	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
SuA:					
Stone	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Uc:					
Udorthents.					
UdB:					
Udorthents.					
Urban land.					
Up:					
Udorthents.					
Pits.					

Table 13.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating was applicable)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
AmD2, AmE:										
Amanda	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
AmF:										
Amanda	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BeA:										
Bennington	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
BeB:										
Bennington	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BoA:										
Blount	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
BoB:										
Blount	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CaB:										
Cardington	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CaC2:										
Cardington	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CeB:										
Centerburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CeC2:										
Centerburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CnA:										
Condit	Poor	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
EdA:										
Edwards	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
GaC2:										
Gallman	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GbA, GbB:										
Gallman	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GcB:										
Gallman	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
GwB:										
Glynwood--------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GwC2:										
Glynwood--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GzC3:										
Glynwood--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HeF:										
Heverlo---------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
HyA:										
Hyatts----------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
HyB:										
Hyatts----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
JmA:										
Jimtown---------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
LbF:										
Latham----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Brecksville-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
LeE:										
Leoni-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
LoA:										
Lobdell---------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
LsA:										
Lobdell---------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Sloan-----------	Poor	Poor	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
LvB:										
Loudonville-----	Fair	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LyD2, LyE2:										
Lybrand---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
LzD3:										
Lybrand---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MaB:										
Martinsville----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
MbB:										
Martinsville----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
McD2:										
Mentor----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MfA:										
Millgrove-------	Fair	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
MgA:										
Millgrove-------	Fair	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
MhA:										
Millgrove-------	Fair	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
MoB:										
Milton----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MoC2:										
Milton----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MpD2:										
Milton----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lybrand---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
PaA:										
Pacer-----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
PwA:										
Pewamo----------	Poor	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Pz:										
Pits.										
RdB2:										
Rarden----------	Fair	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RdC2:										
Rarden----------	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
RdF2:										
Rarden----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
RoA:										
Rossburg--------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RsA:										
Rossburg--------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Sloan-----------	Poor	Poor	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
ScA, ScB:										
Scioto----------	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SdC2:										
Scioto----------	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SfA:										
Scioto----------	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SgA:										
Shoals----------	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
SkA:										
Sloan-----------	Poor	Poor	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
SnA:										
Sloan-----------	Poor	Poor	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
SoA:										
Sloan-----------	Poor	Poor	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
SsA:										
Smothers--------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
SsB:										
Smothers--------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
StA:										
Stone-----------	Fair	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair	Fair.
SuA:										
Stone-----------	Fair	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair	Fair.
Uc:										
Udorthents.										
UdB:										
Udorthents.										
Urban land.										
Up:										
Udorthents.										
Pits.										

Table 14.--Building Site Development

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating was applicable. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AmD2, AmE, AmF:						
Amanda	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
BeA, BeB:						
Bennington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
BoA, BoB:						
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
CaB:						
Cardington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
CaC2:						
Cardington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
CeB:						
Centerburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
CeC2:						
Centerburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: frost action.	Moderate: wetness, slope.
CnA:						
Condit	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
EdA:						
Edwards	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
GaC2:						
Gallman	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
GbA:						
Gallman	Slight	Slight	Slight	Slight	Moderate: frost action.	Slight.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
GbB:						
Gallman	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
GcB:						
Gallman	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
GwB:						
Glynwood	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
GwC2:						
Glynwood	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
GzC3:						
Glynwood	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
HeF:						
Heverlo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
HyA, HyB:						
Hyatts	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
JmA:						
Jimtown	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
LbF:						
Latham	Severe: wetness, slope.	Severe: wetness, slope, shrink-swell.	Severe: wetness, slope, shrink-swell.	Severe: shrink-swell, slope, wetness.	Severe: low strength, slope, frost action.	Severe: slope.
Brecksville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
LeE:						
Leoni	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
LoA:						
Lobdell	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: flooding, wetness.
LsA:						
Lobdell	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: flooding, wetness.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LsA:						
Sloan	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding, frost action.	Severe: ponding.
LvB:						
Loudonville	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Moderate: depth to rock, low strength, frost action.	Moderate: depth to rock.
LyD2, LyE2:						
Lybrand	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
LzD3:						
Lybrand	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
MaB:						
Martinsville	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength, frost action.	Slight.
MbB:						
Martinsville	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
McD2:						
Mentor	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength, frost action.	Severe: slope.
MfA:						
Millgrove	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
MgA:						
Millgrove	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
MhA:						
Millgrove	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, frost action.	Severe: ponding.
MoB:						
Milton	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: low strength.	Moderate: depth to rock.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MoC2:						
Milton----------	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, depth to rock.
MpD2:						
Milton----------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Lybrand---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
PaA:						
Pacer-----------	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, wetness, frost action.	Slight.
PwA:						
Pewamo----------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Pz:						
Pits.						
RdB2:						
Rarden----------	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness, depth to rock.
RdC2:						
Rarden----------	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, slope, wetness.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness, slope, depth to rock.
RdF2:						
Rarden----------	Severe: wetness, slope.	Severe: shrink-swell, slope, wetness.	Severe: wetness, slope, shrink-swell.	Severe: shrink-swell, slope, wetness.	Severe: shrink-swell, low strength, slope.	Severe: slope.
RoA:						
Rossburg--------	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
RsA:						
Rossburg--------	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Sloan-----------	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ScA:						
Scioto	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: frost action, large stones.	Slight.
ScB:						
Scioto	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Moderate: frost action, large stones.	Slight.
SdC2:						
Scioto	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action, large stones.	Moderate: slope.
SfA:						
Scioto	Moderate: large stones.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Slight.
SgA:						
Shoals	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
SkA:						
Sloan	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding, frost action.	Severe: ponding.
SnA:						
Sloan	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding, frost action.	Severe: ponding.
SoA:						
Sloan	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding, frost action.	Severe: ponding.
SsA, SsB:						
Smothers	Severe: depth to rock, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
StA:						
Stone	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
SuA:						
Stone	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Uc:						
Udorthents.						
UdB:						
Udorthents.						
Urban land.						
Up:						
Udorthents.						
Pits.						

Table 15.--Sanitary Facilities

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AmD2, AmE, AmF:					
Amanda	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
BeA:					
Bennington	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
BeB:					
Bennington	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
BoA:					
Blount	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
BoB:					
Blount	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
CaB:					
Cardington	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
CaC2:					
Cardington	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
CeB:					
Centerburg	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
CeC2:					
Centerburg	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
CnA:					
Condit	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
EdA:					
Edwards	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
GaC2:					
Gallman	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, too clayey, slope.
GbA, GbB:					
Gallman	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones, too clayey.
GcB:					
Gallman	Slight	Severe: seepage.	Moderate: too clayey.	Severe: seepage.	Fair: small stones, too clayey.
GwB:					
Glynwood	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
GwC2:					
Glynwood	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
GzC3:					
Glynwood	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
HeF:					
Heverlo	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, small stones.
HyA, HyB:					
Hyatts	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, seepage, wetness.	Severe: wetness.	Poor: too clayey, wetness.
JmA:					
Jimtown	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: wetness.
LbF:					
Latham	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, wetness, slope.	Severe: depth to rock, wetness, slope.	Poor: depth to rock, too clayey, slope.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LbF:					
Brecksville-----	Severe: depth to rock, poor filter, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Poor: depth to rock, slope, thin layer.
LeE:					
Leoni-----------	Severe: slope, poor filter.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: slope.
LoA:					
Lobdell---------	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: small stones, wetness.
LsA:					
Lobdell---------	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: small stones, wetness.
Sloan-----------	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
LvB:					
Loudonville-----	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, thin layer.
LyD2, LyE2:					
Lybrand---------	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope.
LzD3:					
Lybrand---------	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope.
MaB:					
Martinsville----	Slight-----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey.
MbB:					
Martinsville----	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey.
McD2:					
Mentor----------	Severe: slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Poor: slope.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MfA:					
Millgrove-------	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: small stones, ponding.
MgA:					
Millgrove-------	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: small stones, ponding.
MhA:					
Millgrove-------	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: small stones, ponding.
MoB:					
Milton----------	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, too clayey, thin layer.
MoC2:					
Milton----------	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, too clayey, thin layer.
MpD2:					
Milton----------	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Poor: depth to rock, too clayey, slope.
Lybrand---------	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope.
PaA:					
Pacer-----------	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Poor: small stones, too clayey, wetness.
PwA:					
Pewamo----------	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Pz:					
Pits.					
RdB2:					
Rarden----------	Severe: depth to rock, poor filter, wetness.	Severe: depth to rock.	Severe: seepage, too clayey, depth to rock.	Severe: wetness, depth to rock.	Poor: depth to rock, too clayey, hard to pack.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
RdC2:					
Rarden----------	Severe: depth to rock, poor filter, wetness.	Severe: slope, depth to rock.	Severe: seepage, too clayey, depth to rock.	Severe: wetness, depth to rock.	Poor: depth to rock, too clayey, hard to pack.
RdF2:					
Rarden----------	Severe: depth to rock, poor filter, wetness.	Severe: slope, depth to rock.	Severe: seepage, slope, too clayey.	Severe: slope, wetness, depth to rock.	Poor: depth to rock, too clayey, hard to pack.
RoA:					
Rossburg--------	Severe: flooding.	Severe: flooding, seepage.	Severe: flooding, seepage, wetness.	Severe: flooding.	Good.
RsA:					
Rossburg--------	Severe: flooding.	Severe: flooding, seepage.	Severe: flooding, seepage, wetness.	Severe: flooding.	Good.
Sloan-----------	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
ScA, ScB:					
Scioto----------	Moderate: percs slowly, large stones.	Severe: seepage.	Severe: seepage, large stones.	Severe: seepage.	Poor: small stones, seepage.
SdC2:					
Scioto----------	Moderate: percs slowly, slope, large stones.	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: seepage.	Poor: small stones, seepage.
SfA:					
Scioto----------	Moderate: flooding, percs slowly, large stones.	Severe: seepage.	Severe: seepage, large stones.	Severe: seepage.	Poor: small stones.
SgA:					
Shoals----------	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: seepage, wetness.
SkA:					
Sloan-----------	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
SnA:					
Sloan-----------	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SoA:					
Sloan-----------	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
SsA, SsB:					
Smothers--------	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness, too clayey.	Severe: depth to rock, wetness.	Poor: depth to rock, too clayey, wetness.
StA:					
Stone-----------	Severe: wetness.	Severe: seepage, wetness.	Severe: depth to rock, seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
SuA:					
Stone-----------	Severe: wetness.	Severe: wetness, seepage.	Severe: depth to rock, seepage, wetness.	Severe: wetness, seepage.	Poor: wetness.
Uc:					
Udorthents.					
UdB:					
Udorthents.					
Urban land.					
Up:					
Udorthents.					
Pits.					

Table 16.--Construction Materials

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AmD2, AmE:				
Amanda	Fair: slope, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
AmF:				
Amanda	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BeA, BeB:				
Bennington	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
BoA, BoB:				
Blount	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
CaB, CaC2:				
Cardington	Fair: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CeB, CeC2:				
Centerburg	Fair: wetness, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CnA:				
Condit	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
EdA:				
Edwards	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
GaC2:				
Gallman	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
GbA, GbB:				
Gallman	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
GcB:				
Gallman	Good	Improbable: excess fines.	Improbable: too sandy.	Poor: small stones.
GwB, GwC2:				
Glynwood	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
GzC3:				
Glynwood	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HeF:				
Heverlo	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
HyA, HyB:				
Hyatts	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
JmA:				
Jimtown	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
LbF:				
Latham	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Brecksville	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
LeE:				
Leoni	Fair: slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
LoA:				
Lobdell	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
LsA:				
Lobdell	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Sloan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
LvB:				
Loudonville	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, depth to rock, thin layer.
LyD2, LyE2:				
Lybrand	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
LzD3:				
Lybrand	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MaB:				
Martinsville	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
MbB:				
Martinsville	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
McD2:				
Mentor	Fair: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
MfA:				
Millgrove	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MgA:				
Millgrove	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MhA:				
Millgrove	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, wetness.
MoB, MoC2:				
Milton	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, depth to rock.
MpD2:				
Milton	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Lybrand	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
PaA:				
Pacer	Fair: shrink-swell, wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
PwA:				
Pewamo	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Pz:				
Pits.				

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
RdB2, RdC2:				
Rarden	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
RdF2:				
Rarden	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
RoA:				
Rossburg	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
RsA:				
Rossburg	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Sloan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
ScA, ScB:				
Scioto	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SdC2:				
Scioto	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SfA:				
Scioto	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SgA:				
Shoals	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
SkA:				
Sloan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
SnA:				
Sloan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
SoA:				
Sloan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
SsA, SsB:				
Smothers	Poor: depth to rock, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, wetness.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
StA:				
Stone-----------	Poor: thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
SuA:				
Stone-----------	Poor: thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, wetness, small stones.
Uc:				
Udorthents.				
UdB:				
Udorthents.				
Urban land.				
Up:				
Udorthents.				
Pits.				

Table 17.--Water Management

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
AmD2, AmE, AmF:							
Amanda	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
BeA:							
Bennington	Slight	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
BeB:							
Bennington	Moderate: slope.	Severe: wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
BoA:							
Blount	Slight	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
BoB:							
Blount	Moderate: slope.	Severe: wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
CaB:							
Cardington	Moderate: slope.	Moderate: wetness, piping.	Severe: no water.	Percs slowly, frost action, slope.	Slope, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
CaC2:							
Cardington	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, percs slowly, erodes easily.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
CeB:							
Centerburg	Moderate: slope.	Moderate: wetness, piping.	Severe: no water.	Frost action, slope.	Slope, percs slowly, erodes easily.	Erodes easily, wetness.	Erodes easily, wetness.
CeC2:							
Centerburg	Severe: slope.	Moderate: wetness, piping.	Severe: no water.	Frost action, slope.	Slope, percs slowly, erodes easily.	Slope, erodes easily, wetness.	Slope, erodes easily, wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--: Pond reservoir areas	Limitations for--: Embankments, dikes, and levees	Limitations for--: Aquifer-fed excavated ponds	Features affecting--: Drainage	Features affecting--: Irrigation	Features affecting--: Terraces and diversions	Features affecting--: Grassed waterways
CnA:							
Condit	Slight	Severe: ponding.	Severe: no water.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
EdA:							
Edwards	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, percs slowly, subsides.	Ponding, soil blowing, percs slowly.	Ponding, soil blowing, percs slowly.	Wetness, percs slowly.
GaC2:							
Gallman	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
GbA:							
Gallman	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable	Favorable	Favorable.
GbB:							
Gallman	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
GcB:							
Gallman	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
GwB:							
Glynwood	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
GwC2:							
Glynwood	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, percs slowly, erodes easily.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
GzC3:							
Glynwood	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, percs slowly, erodes easily.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
HeF:							
Heverlo	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
HyA:							
Hyatts	Moderate: depth to rock.	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
HyB:							
Hyatts	Moderate: depth to rock, slope.	Severe: wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
JmA:							
Jimtown	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness	Wetness	Wetness.
LbF:							
Latham	Severe: slope.	Severe: thin layer.	Severe: no water.	Percs slowly, depth to rock, frost action.	Slope, depth to rock, percs slowly.	Slope, depth to rock, erodes easily.	Wetness, slope, erodes easily.
Brecksville	Severe: slope.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
LeE:							
Leoni	Severe: seepage, slope.	Severe: piping, seepage.	Severe: no water.	Deep to water	Slope	Slope	Slope.
LoA:							
Lobdell	Severe: seepage.	Severe: piping, seepage.	Moderate: deep to water, slow refill.	Flooding, large stones, frost action.	Wetness, flooding, erodes easily.	Erodes easily, wetness.	Erodes easily, wetness.
LsA:							
Lobdell	Severe: seepage.	Severe: piping, seepage.	Moderate: deep to water, slow refill.	Flooding, large stones, frost action.	Wetness, flooding, erodes easily.	Erodes easily, wetness.	Erodes easily, wetness.
Sloan	Moderate: seepage.	Severe: piping, ponding.	Moderate: slow refill.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
LvB:							
Loudonville-----	Moderate: seepage, depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Depth to rock	Depth to rock.
LyD2, LyE2:							
Lybrand---------	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, rooting depth.
LzD3:							
Lybrand---------	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, rooting depth.
MaB:							
Martinsville----	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
MbB:							
Martinsville----	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
McD2:							
Mentor----------	Severe: slope.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
MfA:							
Millgrove-------	Severe: seepage.	Severe: piping, ponding.	Moderate: slow refill.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
MgA:							
Millgrove-------	Severe: seepage.	Severe: piping, ponding.	Moderate: slow refill.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
MhA:							
Millgrove-------	Severe: seepage.	Severe: piping, ponding.	Moderate: slow refill.	Large stones, frost action, ponding.	Ponding--------	Large stones, ponding.	Large stones, wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
MoB:							
Milton	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
MoC2:							
Milton	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
MpD2:							
Milton	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Lybrand	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, rooting depth.
PaA:							
Pacer	Moderate: seepage.	Moderate: seepage, piping.	Severe: no water.	Favorable	Erodes easily, percs slowly.	Erodes easily, wetness.	Erodes easily.
PwA:							
Pewamo	Slight	Severe: ponding.	Severe: slow refill.	Ponding, frost action.	Ponding	Ponding	Wetness.
Pz:							
Pits.							
RdB2:							
Rarden	Moderate: slope.	Moderate: thin layer, hard to pack, wetness.	Severe: no water.	Percs slowly, depth to rock, frost action.	Slope, erodes easily, percs slowly.	Depth to rock, erodes easily, wetness.	Erodes easily, depth to rock, wetness.
RdC2, RdF2:							
Rarden	Severe: slope.	Moderate: thin layer, hard to pack, wetness.	Severe: no water.	Percs slowly, depth to rock, frost action.	Slope, erodes easily, percs slowly.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

Table 17.--Water Management--Continued

	Limitations for--			Features affecting--			
Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
RoA:							
Rossburg	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Flooding	Erodes easily	Erodes easily.
RsA:							
Rossburg	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Flooding	Erodes easily	Erodes easily.
Sloan	Moderate: seepage.	Severe: piping, ponding.	Moderate: slow refill.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
ScA:							
Scioto	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, droughty, erodes easily.	Large stones, erodes easily.	Large stones, erodes easily.
ScB:							
Scioto	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Large stones, erodes easily.	Large stones, erodes easily.
SdC2:							
Scioto	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones, erodes easily.	Large stones, slope, erodes easily.
SfA:							
Scioto	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, droughty, erodes easily.	Large stones, erodes easily.	Large stones, erodes easily.
SgA:							
Shoals	Moderate: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, frost action, cutbanks cave.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
SkA:							
Sloan	Moderate: seepage.	Severe: piping, ponding.	Moderate: slow refill.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
SnA:							
Sloan	Moderate: seepage.	Severe: piping, ponding.	Moderate: slow refill.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
SoA:							
Sloan	Moderate: seepage.	Severe: piping, ponding.	Moderate: slow refill.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
SsA:							
Smothers	Moderate: depth to rock.	Severe: wetness, thin layer.	Severe: no water.	Percs slowly, depth to rock, frost action.	Wetness, percs slowly, depth to rock.	Depth to rock, erodes easily, wetness.	Wetness, erodes easily, depth to rock.
SsB:							
Smothers	Moderate: depth to rock, slope.	Severe: wetness, thin layer.	Severe: no water.	Percs slowly, depth to rock, frost action.	Slope, wetness, percs slowly.	Depth to rock, erodes easily, wetness.	Wetness, erodes easily, depth to rock.
StA:							
Stone	Severe: seepage.	Severe: wetness.	Severe: slow refill.	Large stones, frost action.	Wetness	Wetness	Wetness.
SuA:							
Stone	Severe: seepage.	Severe: wetness.	Severe: slow refill.	Frost action, large stones.	Wetness	Wetness	Wetness.
Uc:							
Udorthents.							
UdB:							
Udorthents.							
Urban land.							
Up:							
Udorthents.							
Pits.							

Table 18.--Waste Management

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Land application of manure, food-processing waste, and municipal sewage sludge
AmD2, AmE, AmF--- Amanda	Severe: slope.
BeA, BeB--------- Bennington	Severe: percs slowly, wetness.
BoA, BoB--------- Blount	Severe: percs slowly, wetness.
CaB, CaC2-------- Cardington	Severe: percs slowly, wetness.
CeB, CeC2-------- Centerburg	Severe: wetness.
CnA-------------- Condit	Severe: percs slowly, ponding.
EdA-------------- Edwards	Severe: percs slowly, ponding.
GaC2------------- Gallman	Moderate: poor filter, slope.
GbA, GbB--------- Gallman	Moderate: poor filter.
GcB-------------- Gallman	Moderate: poor filter.
GwB, GwC2-------- Glynwood	Severe: percs slowly,
GzC3------------- Glynwood	Severe: percs slowly, wetness.
HeF-------------- Heverlo	Severe: slope.
HyA, HyB--------- Hyatts	Severe: percs slowly, wetness.
JmA-------------- Jimtown	Severe: wetness.

Table 18.--Waste Management--Continued

Map symbol and soil name	Land application of manure, food-processing waste, and municipal sewage sludge
LbF:	
Latham	Severe: percs slowly, wetness, slope.
Brecksville	Severe: percs slowly, slope, too acid.
LeE Leoni	Severe: poor filter, slope.
LoA Lobdell	Severe: wetness, flooding.
LsA:	
Lobdell	Severe: wetness, flooding.
Sloan	Severe: ponding, flooding.
LvB Loudonville	Moderate: depth to rock.
LyD2, LyE2 Lybrand	Severe: percs slowly, slope.
LzD3 Lybrand	Severe: percs slowly, slope.
MaB Martinsville	Slight.
MbB Martinsville	Slight.
McD2 Mentor	Severe: slope.
MfA Millgrove	Severe: ponding.
MgA Millgrove	Severe: ponding.
MhA Millgrove	Severe: ponding, flooding.
MoB Milton	Moderate: percs slowly, depth to rock.

Table 18.--Waste Management--Continued

Map symbol and soil name	Land application of manure, food-processing waste, and municipal sewage sludge
MoC2: Milton	Moderate: percs slowly, slope, depth to rock.
MpD2:	
Milton	Severe: slope.
Lybrand	Severe: slope.
PaA: Pacer	Moderate: percs slowly, wetness.
PwA: Pewamo	Severe: percs slowly, ponding.
Pz. Pits	
RdB2, RdC2: Rarden	Severe: percs slowly, wetness.
RdF2: Rarden	Severe: percs slowly, wetness, slope.
RoA: Rossburg	Severe: flooding.
RsA:	
Rossburg	Severe: flooding.
Sloan	Severe: ponding, flooding.
ScA, ScB: Scioto	Moderate: poor filter.
SdC2: Scioto	Moderate: poor filter, slope.
SfA: Scioto	Moderate: poor filter, flooding.
SgA: Shoals	Severe: wetness, flooding.
SkA: Sloan	Severe: ponding, flooding.

Table 18.--Waste Management--Continued

Map symbol and soil name	Land application of manure, food-processing waste, and municipal sewage sludge
SnA: Sloan	Severe: ponding, flooding.
SoA: Sloan	Severe: ponding, flooding.
SsA, SsB: Smothers	Severe: percs slowly, wetness.
StA, SuA: Stone	Severe: wetness.
Uc. Udorthents	
UdB:	
Udorthents.	
Urban land.	
Up:	
Udorthents.	
Pits.	

Table 19.--Water Quality

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Pesticide loss potential from-- Leaching	Surface runoff
AmD2, AmE, AmF----- Amanda	Moderate: wetness.	Severe: excess runoff.
BeA---------------- Bennington	Severe: wetness.	Slight.
BeB---------------- Bennington	Severe: wetness.	Moderate: excess runoff.
BoA---------------- Blount	Severe: wetness.	Slight.
BoB---------------- Blount	Severe: wetness.	Moderate: excess runoff.
CaB, CaC2---------- Cardington	Severe: wetness.	Moderate: excess runoff.
CeB, CeC2---------- Centerburg	Severe: wetness.	Moderate: excess runoff.
CnA---------------- Condit	Severe: wetness.	Slight.
EdA---------------- Edwards	Severe: wetness.	Slight.
GaC2--------------- Gallman	Moderate: low adsorption.	Moderate: excess runoff.
GbA---------------- Gallman	Moderate: low adsorption.	Slight.
GbB, GcB----------- Gallman	Moderate: low adsorption.	Moderate: excess runoff.
GwB, GwC2, GzC3---- Glynwood	Severe: wetness.	Moderate: excess runoff.
HeF---------------- Heverlo	Severe: poor filter.	Severe: excess runoff.
HyA---------------- Hyatts	Severe: wetness.	Slight.
HyB---------------- Hyatts	Severe: wetness.	Moderate: excess runoff.
JmA---------------- Jimtown	Severe: wetness.	Slight.
LbF:		
Latham------------	Severe: wetness.	Severe: excess runoff.
Brecksville-------	Moderate: poor filter.	Severe: excess runoff.

Table 19.--Water Quality--Continued

Map symbol and soil name	Pesticide loss potential from-- Leaching	Surface runoff
LeE: Leoni	Moderate: seepage.	Severe: excess runoff.
LoA: Lobdell	Severe: wetness.	Moderate: flooding.
LsA:		
Lobdell	Severe: wetness.	Moderate: flooding.
Sloan	Severe: wetness.	Moderate: flooding.
LvB: Loudonville	Moderate: poor filter.	Moderate: excess runoff.
LyD2, LyE2, LzD3: Lybrand	Slight	Severe: excess runoff.
MaB, MbB: Martinsville	Moderate low adsorption.	Moderate: excess runoff.
McD2: Mentor	Moderate: wetness.	Severe: excess runoff.
MfA, MgA, MhA: Millgrove	Severe: wetness.	Slight.
MoB, MoC2: Milton	Moderate: poor filter.	Moderate: excess runoff.
MpD2:		
Milton	Moderate: poor filter.	Severe: excess runoff.
Lybrand	Slight	Severe: excess runoff.
PaA: Pacer	Moderate: wetness.	Slight.
PwA: Pewamo	Severe: wetness.	Slight.
Pz. Pits		
RdB2, RdC2: Rarden	Severe: wetness.	Moderate: excess runoff.
RdF2: Rarden	Severe: wetness.	Severe: excess runoff.
RoA: Rossburg	Moderate: wetness.	Moderate: flooding.
RsA:		
Rossburg	Moderate: wetness.	Moderate: flooding.
Sloan	Severe: wetness.	Moderate: flooding.

Table 19.--Water Quality--Continued

Map symbol and soil name	Pesticide loss potential from-- Leaching	Surface runoff
ScA---------------- Scioto	Moderate: low adsorption.	Slight.
ScB, SdC2---------- Scioto	Moderate: low adsorption.	Moderate: excess runoff.
SfA---------------- Scioto	Moderate: low adsorption.	Slight.
SgA---------------- Shoals	Severe: wetness.	Moderate: flooding.
SkA, SnA, SoA------ Sloan	Severe: wetness.	Moderate: flooding.
SsA---------------- Smothers	Severe: wetness.	Slight.
SsB---------------- Smothers	Severe: wetness.	Moderate: excess runoff.
StA, SuA----------- Stone	Severe: wetness.	Slight.
Uc. Udorthents		
UdB: Udorthents.		
Urban land.		
Up: Udorthents.		
Pits.		

Table 20.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
AmD2:												
Amanda----------	0-9	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0-5	90-100	85-100	75-100	55-90	20-40	3-15
	9-42	Silty clay loam, clay loam, loam.	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	80-100	60-95	25-40	5-20
	42-80	Silt loam, loam.	ML, CL-ML, CL	A-4, A-6	0-1	0-5	95-100	85-95	65-95	50-75	20-35	3-15
AmE:												
Amanda----------	0-9	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0-5	90-100	85-100	75-100	55-90	20-40	3-15
	9-43	Silty clay loam, clay loam, loam.	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	80-100	60-95	25-40	5-20
	43-80	Silt loam, loam.	ML, CL-ML, CL	A-4, A-6	0-1	0-5	95-100	85-95	65-95	50-75	20-35	3-15
AmF:												
Amanda----------	0-8	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0-5	90-100	85-100	75-100	55-90	20-40	3-15
	8-48	Silty clay loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	80-100	60-95	25-40	5-20
	48-80	Loam, silt loam	ML, CL-ML, CL	A-4, A-6	0-1	0-5	95-100	85-95	65-95	50-75	20-35	3-15
BeA:												
Bennington------	0-10	Silt loam------	ML, CL, CL-ML	A-4, A-6	0	0-2	95-100	90-100	85-100	65-90	25-40	3-15
	10-54	Silty clay loam, clay loam, clay.	CL, CH	A-7, A-6	0	0-2	95-100	90-100	75-100	70-95	30-52	12-30
	54-80	Silty clay loam, clay loam, silt loam.	CL, CL-ML	A-6, A-4	0-1	0-2	80-100	80-95	70-95	55-90	25-40	6-20
BeB:												
Bennington------	0-9	Silt loam------	ML, CL, CL-ML	A-4, A-6	0	0-2	95-100	90-100	85-100	65-90	25-40	3-15
	9-55	Silty clay loam, clay loam, clay.	CL, CH	A-7, A-6	0	0-2	95-100	90-100	75-100	70-95	30-52	12-30
	55-80	Silty clay loam, clay loam, silt loam.	CL, CL-ML	A-6, A-4	0-1	0-2	80-100	80-95	70-95	55-90	25-40	6-20

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BoA:												
Blount----------	0-9	Silt loam------	CL	A-6, A-4	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	9-27	Silty clay loam, clay, clay loam.	CH, CL	A-7, A-6	0-1	0-5	95-100	85-95	70-90	60-90	35-60	15-35
	27-38	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-90	60-90	35-50	10-25
	38-80	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	75-95	65-95	60-90	35-50	10-25
BoB:												
Blount----------	0-8	Silt loam------	CL	A-6, A-4	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	8-32	Silty clay loam, clay, clay loam.	CH, CL	A-7, A-6	0-1	0-5	95-100	85-95	70-90	60-90	35-60	15-35
	32-42	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-90	60-90	35-50	10-25
	42-80	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	75-95	65-95	60-90	35-50	10-25
CaB:												
Cardington------	0-8	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	80-100	65-90	20-40	4-15
	8-38	Silty clay loam, clay loam, silty clay.	CL, CH	A-7, A-6	0	0-2	80-100	75-100	70-100	65-90	30-50	10-30
	38-60	Clay loam, silty clay loam, silt loam.	CL, ML, CL-ML	A-6, A-4	0-1	0-5	80-100	80-95	70-95	55-85	22-40	3-20
CaC2:												
Cardington------	0-9	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	80-100	65-90	20-40	4-15
	9-43	Silty clay loam, silty clay, clay loam.	CL, CH	A-7, A-6	0	0-2	80-100	75-100	70-100	65-90	30-50	10-30
	43-80	Silty clay loam, clay loam, silt loam.	CL, ML, CL-ML	A-6, A-4	0-1	0-5	80-100	80-95	70-95	55-85	22-40	3-20

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CeB:												
Centerburg------	0-6	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0-5	90-100	85-100	80-100	65-90	20-30	3-15
	6-12	Silty clay loam, clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	0-5	90-100	75-100	70-100	55-90	25-40	5-20
	12-50	Clay loam, loam, silt loam.	CL, CL-ML	A-4, A-6	0	0-5	85-100	75-95	70-95	55-85	25-40	5-20
	50-80	Loam, silt loam	ML, CL-ML, CL	A-4, A-6	0-1	0-5	85-100	75-95	65-95	50-85	20-30	3-15
CeC2:												
Centerburg------	0-7	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0-5	90-100	85-100	80-100	65-90	20-30	3-15
	7-31	Clay loam, silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	0-5	85-100	75-95	70-95	55-85	25-40	5-20
	31-80	Loam, silt loam	ML, CL-ML, CL	A-4, A-6	0-1	0-5	85-100	75-95	65-95	50-85	20-30	3-15
CnA:												
Condit----------	0-10	Silt loam------	ML, CL, CL-ML	A-4, A-6	0	0-2	95-100	95-100	90-100	80-90	22-40	3-16
	10-70	Silty clay loam, clay loam.	CL, CH	A-6, A-7	0	0-2	95-100	85-100	80-100	70-90	35-55	12-28
	70-80	Silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	0-1	0-2	90-100	80-100	70-95	65-85	25-40	6-20
EdA:												
Edwards---------	0-19	Muck-----------	PT	A-8	0	0	---	---	---	---	---	NP
	19-80	Marl-----------	---	---	0	0	---	---	---	---	---	NP
GaC2:												
Gallman---------	0-7	Loam-----------	ML, CL-ML, CL	A-4	0	0	90-100	85-100	65-100	50-100	25-35	4-10
	7-50	Gravelly clay loam, gravelly loam, very gravelly loam.	CL-ML, SC, CL, GC	A-6, A-4, A-2	0	0	70-100	45-95	35-90	30-70	20-40	5-17
	50-80	Very gravelly sandy loam, loam, sandy loam.	CL, CL-ML, GC, SC	A-2, A-4, A-6	0	0	60-100	45-90	40-80	30-65	15-30	5-15

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
GbA:												
Gallman---------	0-10	Silt loam------	ML, CL-ML, CL	A-4	0	0	90-100	85-100	65-100	50-100	20-35	3-10
	10-56	Gravelly clay loam, clay loam, sandy clay loam.	CL, CL-ML, GC, SC	A-4, A-2, A-6	0	0	70-100	45-95	35-90	30-70	20-40	5-17
	56-80	Gravelly loam, loam, very gravelly sandy loam.	CL, CL-ML, SC, GC	A-4, A-2, A-6	0	0	60-100	45-90	40-80	30-65	15-30	5-15
GbB:												
Gallman---------	0-9	Silt loam------	ML, CL-ML, CL	A-4	0	0	90-100	85-100	65-100	50-100	20-35	3-10
	9-73	Loam, sandy clay loam, very gravelly clay loam.	CL, CL-ML, GC, SC	A-4, A-2, A-6	0	0	70-100	45-95	35-90	30-70	20-40	5-17
	73-80	Loam, gravelly loam, very gravelly sandy loam.	CL, CL-ML, SC, GC	A-4, A-2, A-6	0	0	60-100	45-90	40-80	30-65	15-30	5-15
GcB:												
Gallman---------	0-12	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0	95-100	95-100	85-95	70-95	20-40	4-15
	12-60	Gravelly clay loam, sandy clay loam, very gravelly coarse sandy loam.	CL, SM, GC, SC	A-2, A-4, A-6	0	0-2	75-100	45-95	40-95	30-85	20-40	5-20
	60-65	Very gravelly sandy loam, loam, sandy loam.	GM, SP-SM, SM	A-2, A-4	0	0-2	60-95	45-95	30-75	10-50	0-20	NP-10
	65-80	Silty clay loam	CL, CL-ML	A-6, A-4	0-1	0-5	95-100	85-100	80-95	65-90	20-40	5-20

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
GwB:												
Glynwood--------	0-8	Silt loam------	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-100	55-90	23-40	4-20
	8-25	Silty clay loam, clay, clay loam.	CL, CH	A-7, A-6	0-1	0-5	95-100	85-100	75-100	65-95	35-60	15-35
	25-33	Silty clay loam, clay loam.	CL	A-6, A-4, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
	33-80	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
GwC2:												
Glynwood--------	0-7	Silt loam------	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-100	55-90	23-40	4-20
	7-22	Silty clay loam, clay, clay loam.	CL, CH	A-7, A-6	0-1	0-5	95-100	85-100	75-100	65-95	35-60	15-35
	22-36	Silty clay loam, clay loam.	CL	A-6, A-4, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
	36-80	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
GzC3:												
Glynwood--------	0-7	Silty clay loam	CL	A-6, A-7	0	0-2	95-100	90-100	80-100	65-95	25-45	10-25
	7-18	Silty clay, clay, clay loam.	CL, CH	A-7, A-6	0-1	0-5	95-100	85-100	75-100	65-95	35-60	15-35
	18-36	Silty clay loam, clay loam.	CL	A-6, A-4, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
	36-80	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
HeF:												
Heverlo---------	0-10	Silt loam------	CL-ML, CL	A-4, A-6	0	0-5	90-100	85-100	80-100	60-90	20-30	5-15
	10-27	Silty clay loam, channery clay loam, gravelly clay.	CL, GM, GC, SC	A-6, A-7	0	0-5	70-100	50-95	50-90	40-90	40-50	20-30
	27-37	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
HyA:												
Hyatts----------	0-11	Silt loam------	CL, CL-ML	A-4, A-6	0	0-2	95-100	90-100	85-100	65-90	20-30	5-15
	11-35	Silty clay loam, silty clay.	CL	A-6, A-7	0	0-2	85-100	85-100	75-100	70-95	40-50	20-25
	35-46	Silty clay, channery silty clay loam.	CH, CL	A-7	0	0-5	85-100	65-100	65-95	60-95	40-60	20-35
	46-56	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
HyB:												
Hyatts----------	0-9	Silt loam------	CL, CL-ML	A-4, A-6	0	0-2	95-100	90-100	85-100	65-90	20-30	5-15
	9-50	Silty clay loam, silty clay.	CL	A-6, A-7	0	0-2	85-100	85-100	75-100	70-95	40-50	20-25
	50-58	Silty clay loam, channery silty clay loam, channery silty clay.	CH, CL	A-7	0	0-5	85-100	65-100	65-95	60-95	40-60	20-35
	58-68	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
JmA:												
Jimtown---------	0-10	Silt loam------	ML, CL-ML, CL	A-4	0	0	95-100	90-100	60-95	50-80	20-30	NP-10
	10-47	Silty clay loam, silt loam, sandy loam.	CL-ML, CL, SM, SC	A-4, A-6, A-2	0	0-2	75-100	55-100	45-95	30-75	25-40	4-15
	47-80	Stratified sandy loam to gravelly clay loam.	SM, GM	A-1, A-4, A-2	0	0-5	45-90	30-90	20-75	10-50	15-30	5-15
LbF:												
Latham----------	0-3	Silt loam------	CL-ML, CL	A-4, A-6	0	0-5	85-100	80-100	70-100	65-90	20-40	5-15
	3-30	Silty clay, silty clay loam, channery silty clay loam.	CH, CL	A-7	0	0-10	85-100	55-95	55-95	50-90	40-65	20-40
	30-40	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LbF:												
Brecksville-----	0-3	Silt loam------	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	75-100	60-90	25-40	5-15
	3-22	Silty clay loam, channery silty clay loam, very channery silty clay loam.	CL, GC	A-6, A-7	0	0-10	70-95	45-95	40-95	40-90	30-50	10-25
	22-32	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
LeE:												
Leoni-----------	0-7	Gravelly loam, very gravelly loam.	SM, SC	A-2, A-4	0-2	0-5	75-95	45-75	40-70	30-50	0-30	NP-7
	7-37	Very gravelly clay loam, very gravelly loam, very gravelly sandy loam.	SC, SW-SM	A-6, A-4, A-2	0-2	0-5	70-90	25-50	15-45	10-40	20-40	10-15
	37-80	Very gravelly sandy loam, gravelly loamy sand, loamy sand.	SC, SW-SM	A-2, A-1, A-4	0-2	0-10	60-90	45-85	10-60	5-40	0-20	NP-8
LoA:												
Lobdell---------	0-9	Silt loam------	ML, CL-ML, CL	A-4	0	0	95-100	90-100	80-100	65-90	20-30	NP-10
	9-48	Loam, clay loam, silt loam.	ML, SM, CL-ML, CL	A-4	0	0-5	85-100	75-95	60-90	45-80	15-35	NP-10
	48-65	Stratified very channery clay loam to very channery loam.	SM, SC, ML, CL	A-2, A-4, A-1	0-5	5-30	65-90	35-75	30-70	20-65	0-30	NP-15

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LsA:												
Lobdell---------	0-11	Silt loam------	ML, CL-ML, CL	A-4	0	0	95-100	90-100	80-100	65-90	20-30	NP-10
	11-44	Loam, silt loam, clay loam.	ML, CL-ML, CL	A-4	0	0-5	85-100	75-95	60-90	45-80	20-35	NP-15
	44-80	Stratified channery loam to very channery sandy loam.	SM, SC, ML, CL	A-2, A-4, A-1	0-5	5-30	65-90	35-75	30-70	20-65	0-30	NP-15
Sloan-----------	0-8	Silt loam------	CL, CL-ML, ML	A-4	0	0	100	95-100	80-95	70-90	20-30	4-10
	8-19	Silty clay loam	CL	A-6, A-7-6	0	0	100	95-100	90-100	85-95	30-48	10-25
	19-25	Silty clay loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6, A-7	0	0	95-100	90-100	60-90	50-80	20-45	5-18
	25-64	Stratified silty clay loam to loam.	SM, CL, CL-ML, GC	A-4, A-6, A-2-4, A-2-6	0	0	60-95	50-95	40-85	25-70	20-40	4-12
	64-80	Clay loam------	CL	A-6, A-7-6	0-1	0-5	90-100	75-95	70-95	65-85	30-45	NP-30
LvB:												
Loudonville-----	0-12	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0-1	95-100	90-100	75-95	55-90	20-35	2-15
	12-33	Silty clay loam, silt loam, channery clay loam.	SM, CL, CL-ML, SC	A-4, A-6, A-7	0	0-2	90-100	60-95	50-90	40-85	25-42	6-20
	33-34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP
LyD2:												
Lybrand---------	0-9	Silt loam------	CL	A-6, A-4	0	0-5	95-100	95-100	90-100	70-90	30-40	10-15
	9-33	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-5	95-100	85-100	85-95	65-90	40-60	20-30
	33-45	Silty clay loam, clay loam.	CL	A-6, A-4, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
	45-80	Silty clay loam, clay loam.	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LyE2:												
Lybrand---------	0-7	Silt loam------	CL	A-6, A-4	0	0-5	95-100	95-100	90-100	70-90	30-40	10-15
	7-25	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-5	95-100	85-100	85-95	65-90	40-60	20-30
	25-37	Silty clay loam, clay loam.	CL	A-6, A-4, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
	37-80	Silty clay loam, clay loam.	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
LzD3:												
Lybrand---------	0-2	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-95	80-90	35-45	15-20
	2-15	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-5	95-100	85-100	85-95	65-90	40-60	20-30
	15-32	Silty clay loam, clay loam.	CL	A-6, A-4, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
	32-80	Silty clay loam, clay loam.	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
MaB:												
Martinsville----	0-7	Loam-----------	CL, CL-ML, ML	A-4, A-6	0	0	100	85-100	70-100	50-90	23-40	3-20
	7-40	Clay loam, loam, sandy clay loam.	SC-SM, CL-ML, CL, SC	A-2, A-4, A-6, A-7	0	0	95-100	85-100	70-100	30-75	20-50	5-30
	40-80	Sandy clay loam, clay loam, sandy loam.	SM, SC-SM, CL-ML, SC	A-4, A-2-4, A-6, A-2-6	0	0	95-100	85-100	50-95	25-70	15-30	5-15
MbB:												
Martinsville----	0-11	Loam-----------	CL-ML, CL	A-4, A-6	0	0	100	90-100	75-100	55-90	0-30	4-11
	11-55	Clay loam, loam, sandy loam.	CL	A-4, A-6	0	0	100	90-100	75-100	55-90	25-40	9-20
	55-65	Stratified sandy loam to loamy sand.	SC-SM, SC, CL, CL-ML	A-4, A-6, A-2-4, A-2-6	0	0	95-100	85-100	50-95	30-65	10-30	5-10
	65-80	Loam-----------	CL-ML, ML, CL	A-4, A-6	0	0-3	90-100	85-95	70-85	50-75	15-40	5-20

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
McD2:												
Mentor----------	0-7	Silt loam------	ML, CL, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-90	20-35	3-14
	7-62	Silty clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	80-95	20-40	4-18
	62-80	Stratified silt to very fine sandy loam.	ML, CL, SM, SC	A-4, A-6	0	0	90-100	85-100	80-95	45-85	20-40	2-15
MfA:												
Millgrove-------	0-12	Silt loam------	ML, CL, CL-ML	A-4, A-6	0	0	95-100	90-95	70-95	55-90	20-40	3-16
	12-38	Clay loam, silty clay loam, loam.	CL, SC	A-6	0	0	85-100	80-100	70-95	40-75	25-40	11-26
	38-50	Gravelly loam, clay loam, very gravelly sandy loam.	CL, CL-ML, SC	A-4, A-6, A-2	0	0-5	60-95	35-85	35-80	30-60	20-40	4-15
	50-80	Stratified extremely gravelly loam to very cobbly coarse sandy loam.	SC, SC-SM, SW-SM	A-2, A-4	0	0-5	60-85	10-50	10-45	5-40	15-35	NP-10
MgA:												
Millgrove-------	0-15	Silty clay loam	CL, ML	A-4, A-6, A-7	0	0	85-100	80-100	75-100	70-95	25-45	7-16
	15-45	Silty clay loam, loam, clay loam.	CL, SC	A-6	0	0	85-100	80-100	70-95	40-75	25-40	11-26
	45-55	Gravelly silt loam, gravelly clay loam, very gravelly sandy loam.	CL, CL-ML, SC	A-4, A-6, A-2	0	0-5	60-95	35-85	35-80	30-60	20-40	4-15
	55-80	Stratified very gravelly loam to very gravelly silt loam.	SC, SC-SM, SW-SM	A-2, A-4	0	0-5	60-85	10-50	10-45	5-40	15-35	NP-10

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MhA:												
Millgrove-------	0-10	Silty clay loam	CL	A-6, A-7	0	0	90-100	80-100	75-95	70-90	30-40	10-20
	10-27	Silty clay loam, clay loam, loam.	CL, CL-ML	A-6, A-7, A-4	0	0	90-100	75-90	70-90	65-90	20-40	5-15
	27-34	Very gravelly clay loam, gravelly loam, gravelly sandy loam.	CL-ML, CL, GC, SC	A-2, A-4, A-6	0-5	5-50	50-80	40-70	35-65	30-65	20-40	5-15
	34-80	Stratified extremely gravelly loam to extremely cobbly sandy loam.	CL-ML, ML, GM, SC	A-2, A-4, A-1	0-10	10-50	40-80	35-70	30-60	20-55	0-20	NP-10
MoB:												
Milton----------	0-10	Silt loam------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	20-40	4-20
	10-28	Clay loam, clay, silty clay loam.	CL, CH	A-6, A-7	0	0	95-100	80-100	75-100	70-95	32-60	12-30
	28-31	Extremely gravelly clay loam, silty clay loam, clay.	CH, CL, GM, GC	A-7, A-6	0-1	0-15	45-100	30-95	30-95	25-90	32-55	14-33
	31-32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP
MoC2:												
Milton----------	0-10	Silt loam------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	20-40	4-20
	10-28	Silty clay loam, loam, clay.	CL, CH	A-6, A-7	0	0	95-100	80-100	75-100	70-95	32-60	12-30
	28-29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP
MpD2:												
Milton----------	0-8	Silt loam------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	20-40	4-20
	8-22	Silty clay loam, clay loam, clay.	CL, CH	A-6, A-7	0	0	95-100	80-100	75-100	70-95	32-60	12-30
	22-23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
MpD2:												
Lybrand---------	0-7	Silt loam------	CL	A-6, A-4	0	0-5	95-100	95-100	90-100	70-90	30-40	10-15
	7-30	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-5	95-100	85-100	85-95	65-90	40-60	20-30
	30-48	Silty clay loam, clay loam.	CL	A-6, A-4, A-7	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
	48-80	Silty clay loam, clay loam.	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	65-90	35-50	10-25
PaA:												
Pacer-----------	0-14	Silt loam------	CL, CL-ML	A-4, A-6	0	0	95-100	80-100	75-100	75-95	20-40	5-15
	14-51	Gravelly clay loam, very gravelly loam, gravelly sandy clay loam.	CL, SC, GC, GM	A-6, A-4, A-2	0	0-2	60-100	35-75	35-70	20-60	30-40	10-20
	51-80	Silt loam, loam	CL, CL-ML	A-6, A-4	0	0-1	95-100	80-97	75-95	70-95	20-40	5-15
PwA:												
Pewamo----------	0-13	Silty clay loam, silty clay.	CL	A-6, A-7	0	0-5	95-100	90-100	75-100	70-90	35-50	15-25
	13-57	Silty clay, silty clay loam, clay.	CL, CH	A-7	0	0-5	95-100	85-100	75-100	75-95	40-55	20-35
	57-80	Silty clay loam, clay loam.	CL	A-7	0	0-5	95-100	75-100	75-100	70-90	35-50	15-25
Pz:												
Pits.												
RdB2:												
Rarden----------	0-3	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0	100	95-100	90-100	85-95	25-40	4-15
	3-33	Silty clay, silty clay loam, channery clay.	CH, CL	A-7	0	0-10	85-100	70-100	65-100	60-100	40-70	20-40
	33-43	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
RdC2:												
Rarden----------	0-3	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0	100	95-100	90-100	85-95	25-40	4-15
	3-34	Silty clay, silty clay loam, channery clay.	CH, CL	A-7	0	0-10	85-100	70-100	65-100	60-100	40-70	20-40
	34-44	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
RdF2:												
Rarden----------	0-3	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0	100	95-100	90-100	85-95	25-40	4-15
	3-38	Silty clay, silty clay loam, channery clay.	CH, CL	A-7	0	0-10	85-100	70-100	65-100	60-100	40-70	20-40
	38-48	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
RoA:												
Rossburg--------	0-20	Silt loam------	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-100	60-90	20-35	5-15
	20-67	Silt loam, loam	CL-ML, CL	A-4, A-6	0	0	90-100	85-100	70-95	50-80	20-35	5-15
	67-80	Stratified silt loam to loam.	ML, CL, SM, SC	A-4, A-2-4	0	0	80-100	70-100	45-90	27-70	15-25	NP-10
RsA:												
Rossburg--------	0-12	Silt loam------	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-100	60-90	20-35	5-15
	12-40	Silt loam, loam	CL-ML, CL	A-4, A-6	0	0	90-100	85-100	70-95	50-80	20-35	5-15
	40-80	Stratified silt loam to gravelly sandy loam.	ML, CL, SM, SC	A-4, A-2-4	0	0	80-100	70-100	45-90	27-70	15-25	NP-10
Sloan-----------	0-15	Silt loam------	CL, ML, CL-ML	A-6, A-4	0	0	100	95-100	85-100	70-95	20-40	3-15
	15-35	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7, A-4	0	0	100	90-100	85-100	75-95	30-45	8-18
	35-80	Stratified silty clay loam to gravelly loam.	ML, CL	A-4, A-6	0	0	85-100	50-100	45-95	40-90	25-40	3-15

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
ScA:												
Scioto----------	0-10	Silt loam------	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	80-100	70-95	20-40	5-15
	10-16	Clay, clay loam, silty clay loam.	CL, CH	A-7	0	0-5	95-100	80-95	75-95	70-90	40-60	20-30
	16-51	Extremely cobbly silt loam, extremely cobbly loam, extremely cobbly silty clay loam.	GM, GC, SC, SW-SC	A-2	0-5	5-50	60-80	30-50	15-35	5-35	30-40	10-20
	51-80	Extremely stony coarse sandy loam, extremely cobbly loamy coarse sand, extremely cobbly loam.	GP-GM, GP-GC, SM, SW-SM	A-2, A-1-b	0-40	10-50	60-80	10-30	5-15	5-10	0-30	NP-10
ScB:												
Scioto----------	0-12	Silt loam------	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	80-100	70-95	20-40	5-15
	12-20	Silty clay loam, clay loam, clay.	CL, CH	A-7	0	0-5	95-100	80-95	75-95	70-90	40-60	20-30
	20-37	Very gravelly silty clay loam, extremely gravelly loam, extremely cobbly silt loam.	GM, GC, SC, SW-SC	A-2	0-5	5-50	60-80	30-50	15-35	5-35	30-40	10-20
	37-80	Extremely stony sandy loam, extremely cobbly loamy coarse sand, extremely cobbly loam.	GP-GM, GP-GC, SM, SW-SM	A-2, A-1-b	0-40	10-50	60-80	10-30	5-15	5-10	0-30	NP-10

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SdC2:												
Scioto----------	0-5	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	80-100	80-100	75-95	35-45	15-20
	5-15	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0	0-5	95-100	80-95	75-95	70-90	40-60	20-30
	15-55	Very gravelly silt loam, extremely cobbly clay loam, extremely gravelly silty clay loam.	GM, GC, SC, SW-SC	A-2	0-5	5-50	60-80	30-50	15-35	5-35	30-40	10-20
	55-80	Extremely cobbly loam, extremely cobbly loamy coarse sand, extremely stony coarse sandy loam.	GP-GM, GP-GC, SM, SW-SM	A-2, A-1-b	0-40	10-50	60-80	10-30	5-15	5-10	0-30	NP-10
SfA:												
Scioto----------	0-14	Silt loam------	CL, CL-ML	A-4, A-6	0	0	95-100	80-100	90-100	70-95	20-40	5-15
	14-20	Clay loam, clay, silty clay loam.	CL, CH	A-7	0	0	95-100	80-95	75-95	70-90	40-60	20-30
	20-40	Extremely cobbly clay loam, extremely cobbly loam, very gravelly silt loam.	SW-SC, SC, GM, GC	A-2	0-5	5-50	60-80	30-50	15-35	5-35	30-40	10-20
	40-80	Extremely cobbly sandy loam, extremely cobbly loam, extremely stony loamy coarse sand.	GP-GM, GP-GC, SM, SW-SM	A-2, A-1-b	0-40	10-50	60-80	10-30	5-15	5-10	0-30	NP-10

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SgA:												
Shoals----------	0-10	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	65-90	20-35	6-15
	10-29	Silt loam, loam, sandy loam.	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	75-85	25-40	5-15
	29-60	Stratified silt loam to sandy loam.	ML, CL-ML, SM, CL	A-4	0	0-3	90-100	75-100	50-80	40-70	15-30	5-15
SkA:												
Sloan-----------	0-12	Silt loam------	CL, ML, CL-ML	A-6, A-4	0	0	100	95-100	85-100	70-95	20-40	3-15
	12-48	Silty clay loam, clay loam, silt loam.	CL, ML	A-6, A-7, A-4	0	0	100	90-100	85-100	75-95	30-45	8-18
	48-80	Stratified gravelly clay loam to gravelly silt loam.	ML, CL	A-4, A-6	0	0	85-100	50-100	45-95	40-90	25-40	3-15
SnA:												
Sloan-----------	0-13	Silt loam------	CL, CL-ML, ML	A-4	0	0	100	95-100	80-95	70-90	20-30	4-10
	13-19	Silty clay loam	CL	A-6, A-7-6	0	0	100	95-100	90-100	85-95	30-48	10-25
	19-37	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6, A-7	0	0	95-100	90-100	60-90	50-80	20-45	5-18
	37-61	Stratified silt loam to very gravelly loam.	SM, CL, CL-ML, GC	A-4, A-6, A-2-4, A-2-6	0	0	60-95	50-95	40-85	25-70	20-40	4-12
	61-80	Clay loam------	CL	A-6, A-7-6	0-1	0-5	90-100	75-95	70-95	65-85	30-45	NP-30
SoA:												
Sloan-----------	0-12	Silty clay loam	CL	A-6, A-7-6	0	0	100	95-100	85-95	80-95	30-45	10-20
	12-22	Silty clay loam	CL	A-6, A-7-6	0	0	100	95-100	90-100	85-95	30-48	10-25
	22-47	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6, A-7	0	0	95-100	90-100	60-90	50-80	20-45	5-18
	47-75	Stratified silt loam to very gravelly clay loam.	SM, CL, CL-ML, GC	A-4, A-6, A-2-4, A-2-6	0	0	60-95	50-95	40-85	25-70	20-40	4-12
	75-80	Clay loam------	CL	A-6, A-7-6	0-1	0-5	90-100	75-95	70-95	65-85	30-45	NP-30

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SsA:												
Smothers--------	0-10	Silt loam------	CL	A-4, A-6	0	0-2	95-100	80-100	80-100	65-90	30-40	10-15
	10-22	Silty clay, silty clay loam, clay loam.	CL	A-7	0	0-2	85-100	80-95	75-95	60-90	40-50	20-30
	22-30	Extremely flaggy silty clay, channery clay loam, channery silty clay loam.	CH, CL	A-7	0-50	5-50	85-100	55-95	55-75	50-70	40-60	20-35
	30-31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP
SsB:												
Smothers--------	0-9	Silt loam------	CL	A-4, A-6	0	0-2	95-100	80-100	80-100	65-90	30-40	10-15
	9-29	Silty clay loam, silty clay, clay loam.	CL	A-7	0	0-2	85-100	80-95	75-95	60-90	40-50	20-30
	29-33	Very channery silty clay, extremely flaggy silty clay, flaggy silty clay loam.	CH, CL	A-7	0-50	5-50	85-100	55-95	55-75	50-70	40-60	20-35
	33-34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
StA:												
Stone-----------	0-12	Silty clay loam	CL	A-6, A-7	0	0-2	95-100	75-95	70-90	65-85	35-45	15-20
	12-20	Silty clay loam, clay loam.	CL	A-6, A-7	0	0-2	95-100	75-95	70-90	65-85	35-50	15-25
	20-30	Very gravelly silt loam, very cobbly loam, loam.	CL, CL-ML, SC, SM	A-2, A-4, A-6	0-5	0-20	70-95	35-85	25-80	20-75	20-40	5-15
	30-42	Very cobbly loam, extremely channery loam, extremely stony silt loam.	GM, GC, GP-GC	A-2-4, A-2-6	0-30	15-40	30-55	10-45	10-40	5-35	20-40	5-15
	42-43	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP
SuA:												
Stone-----------	0-12	Clay loam------	CL	A-6, A-7	0	0-2	95-100	75-95	70-90	65-85	35-45	15-20
	12-29	Clay loam, silty clay loam.	CL	A-6, A-7	0	0-2	95-100	75-95	70-90	65-85	35-50	15-25
	29-34	Gravelly loam, very cobbly silt loam, loam.	CL, CL-ML, SC, SM	A-2, A-4, A-6	0-5	0-20	70-95	35-85	25-85	20-75	20-40	5-15
	34-44	Extremely channery loam, very cobbly loam, extremely stony silt loam.	GM, GC, GP-GC	A-2-4, A-2-6	0-30	15-40	30-55	10-45	10-40	5-35	20-40	5-15
	44-45	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP
Uc:												
Udorthents.												
UdB:												
Udorthents.												
Urban land.												

Table 20.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
Up:												
Udorthents.												
Pits.												

Table 21.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that the data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in		Pct					
AmD2:												
Amanda----------	0-9	12-27	1.25-1.45	0.60-2.00	0.18-0.24	Low------	0.5-3.0	0.37	0.43	5	6	48
	9-42	23-35	1.45-1.65	0.60-2.00	0.15-0.20	Moderate	0.0-1.0	0.37	0.43			
	42-80	15-25	1.55-1.75	0.20-0.60	0.08-0.12	Low------	0.0-0.5	0.32	0.37			
AmE:												
Amanda----------	0-9	12-27	1.25-1.45	0.60-2.00	0.18-0.24	Low------	1.0-3.0	0.37	0.43	5	6	48
	9-43	23-35	1.45-1.65	0.60-2.00	0.15-0.20	Moderate	0.0-1.0	0.37	0.43			
	43-80	15-25	1.55-1.75	0.20-0.60	0.08-0.12	Low------	0.0-0.5	0.32	0.37			
AmF:												
Amanda----------	0-8	12-27	1.25-1.45	0.60-2.00	0.18-0.24	Low------	1.0-3.0	0.37	0.43	5	6	48
	8-48	23-35	1.45-1.65	0.60-2.00	0.15-0.20	Moderate	0.0-1.0	0.37	0.43			
	48-80	15-25	1.55-1.75	0.20-0.60	0.08-0.12	Low------	0.0-0.5	0.32	0.37			
BeA:												
Bennington------	0-10	15-25	1.30-1.50	0.60-2.00	0.17-0.21	Low------	2.0-4.0	0.43	0.43	5	6	48
	10-54	35-42	1.40-1.70	0.06-0.20	0.10-0.17	Moderate	0.5-1.0	0.32	0.37			
	54-80	24-33	1.65-1.80	0.06-0.20	0.07-0.12	Low------	0.0-0.5	0.32	0.37			
BeB:												
Bennington------	0-9	15-25	1.30-1.50	0.60-2.00	0.17-0.21	Low------	2.0-4.0	0.43	0.43	5	6	48
	9-55	35-42	1.40-1.70	0.06-0.20	0.10-0.17	Moderate	0.5-1.0	0.32	0.37			
	55-80	24-33	1.65-1.80	0.06-0.20	0.07-0.12	Low------	0.0-0.5	0.32	0.37			
BoA:												
Blount----------	0-9	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low------	2.0-4.0	0.32	0.37	4	6	48
	9-27	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	0.0-1.0	0.32	0.37			
	27-38	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	0.0-0.5	0.32	0.37			
	38-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	0.0-0.5	0.32	0.37			
BoB:												
Blount----------	0-8	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low------	2.0-4.0	0.32	0.37	4	6	48
	8-32	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	0.0-1.0	0.32	0.37			
	32-42	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	0.0-0.5	0.32	0.37			
	42-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	0.0-0.5	0.32	0.37			
CaB:												
Cardington------	0-8	12-27	1.30-1.50	0.60-2.00	0.18-0.23	Low------	1.0-3.0	0.37	0.37	5	6	48
	8-38	35-42	1.45-1.70	0.06-0.20	0.10-0.17	Moderate	0.5-1.0	0.37	0.43			
	38-80	24-33	1.65-1.82	0.06-0.20	0.07-0.12	Low------	0.0-0.5	0.37	0.43			
CaC2:												
Cardington------	0-9	12-27	1.30-1.50	0.60-2.00	0.18-0.23	Low------	0.5-3.0	0.37	0.37	5	6	48
	9-43	35-42	1.45-1.70	0.06-0.20	0.10-0.17	Moderate	0.5-1.0	0.37	0.43			
	43-80	24-33	1.65-1.82	0.06-0.20	0.07-0.12	Low------	0.0-0.5	0.37	0.43			
CeB:												
Centerburg------	0-6	10-22	1.25-1.45	0.60-2.00	0.18-0.24	Low------	1.0-3.0	0.37	0.43	5	5	56
	6-12	20-35	1.40-1.70	0.60-2.00	0.15-0.22	Moderate	0.0-1.0	0.37	0.43			
	12-50	25-35	1.45-1.70	0.20-0.60	0.15-0.19	Moderate	0.0-0.5	0.32	0.37			
	50-80	15-25	1.55-1.75	0.20-0.60	0.05-0.12	Low------	0.0-0.5	0.32	0.37			

Table 21.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in		Pct					
CeC2:												
Centerburg------	0-7	10-22	1.25-1.45	0.60-2.00	0.18-0.24	Low------	0.5-3.0	0.37	0.43	5	5	56
	7-31	25-35	1.45-1.70	0.20-0.60	0.15-0.19	Moderate	0.0-0.5	0.37	0.43			
	31-80	15-25	1.55-1.75	0.20-0.60	0.05-0.12	Low------	0.0-0.5	0.32	0.37			
CnA:												
Condit----------	0-10	18-27	1.30-1.50	0.60-2.00	0.19-0.23	Low------	2.0-4.0	0.37	0.37	3	6	48
	10-70	30-40	1.45-1.75	0.06-0.20	0.08-0.16	Moderate	0.5-2.0	0.32	0.37			
	70-80	27-36	1.65-1.80	0.06-0.20	0.07-0.12	Moderate	0.0-0.5	0.32	0.37			
EdA:												
Edwards---------	0-19	---	0.30-0.55	0.20-6.00	0.35-0.45	---------	55-75	---	---	1	2	134
	19-80	3-6	---	0.06-0.60	---	Low------	---	---	---			
GaC2:												
Gallman---------	0-7	10-25	1.30-1.45	0.60-2.00	0.14-0.20	Low------	0.5-3.0	0.32	0.37	5	5	56
	7-50	15-30	1.45-1.65	2.00-6.00	0.10-0.16	Low------	0.0-1.0	0.24	0.32			
	50-80	15-27	1.30-1.50	2.00-6.00	0.08-0.14	Low------	0.0-0.5	0.32	0.43			
GbA:												
Gallman---------	0-10	10-25	1.30-1.50	0.60-2.00	0.14-0.20	Low------	1.0-3.0	0.32	0.37	5	5	56
	10-56	15-30	1.45-1.65	2.00-6.00	0.10-0.16	Low------	0.0-1.0	0.24	0.32			
	56-80	15-27	1.30-1.50	2.00-6.00	0.08-0.14	Low------	0.0-0.5	0.32	0.43			
GbB:												
Gallman---------	0-9	10-25	1.30-1.50	0.60-2.00	0.14-0.20	Low------	1.0-3.0	0.32	0.37	5	5	56
	9-73	15-30	1.45-1.65	2.00-6.00	0.10-0.16	Low------	0.0-1.0	0.24	0.32			
	73-80	15-27	1.30-1.50	2.00-6.00	0.08-0.14	Low------	0.0-0.5	0.32	0.43			
GcB:												
Gallman---------	0-12	14-27	1.30-1.50	0.60-2.00	0.14-0.20	Low------	1.0-3.0	0.37	0.37	5	6	48
	12-60	10-35	1.45-1.65	2.00-6.00	0.10-0.16	Low------	0.0-0.5	0.24	0.32			
	60-65	2-10	1.45-1.60	2.00-6.00	0.05-0.10	Low------	0.0-0.5	0.28	0.43			
	65-80	14-35	1.50-1.75	0.06-0.60	0.05-0.12	Moderate	0.0-0.5	0.32	0.37			
GwB:												
Glynwood--------	0-8	16-27	1.25-1.50	0.60-2.00	0.20-0.24	Low------	1.0-3.0	0.43	0.43	4	6	48
	8-25	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	0.5-1.0	0.32	0.37			
	25-33	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	0.0-0.5	0.32	0.37			
	33-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	0.0-0.5	0.32	0.37			
GwC2:												
Glynwood--------	0-7	16-27	1.25-1.50	0.60-2.00	0.20-0.24	Low------	0.5-3.0	0.43	0.43	4	6	48
	7-22	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	0.5-1.0	0.32	0.37			
	22-36	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	0.0-0.5	0.32	0.37			
	36-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	0.0-0.5	0.32	0.37			
GzC3:												
Glynwood--------	0-7	27-38	1.35-1.55	0.20-0.60	0.17-0.23	Moderate	0.5-2.0	0.43	0.49	4	7	38
	7-18	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	0.5-1.0	0.32	0.37			
	18-36	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	0.0-0.5	0.32	0.37			
	36-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	0.0-0.5	0.32	0.37			
HeF:												
Heverlo---------	0-10	15-25	1.25-1.45	0.60-2.00	0.20-0.24	Low------	1.0-3.0	0.37	0.43	3	5	56
	10-27	35-45	1.45-1.60	0.60-2.00	0.12-0.17	Moderate	0.0-1.0	0.28	0.43			
	27-37	---	---	0.00-0.20	---	---------	---	---	---			

Table 21.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in		Pct					
HyA:												
Hyatts----------	0-11	15-25	1.30-1.50	0.60-2.00	0.17-0.21	Low------	2.0-4.0	0.43	0.43	4	6	48
	11-35	35-42	1.40-1.70	0.06-0.60	0.10-0.17	Moderate	0.0-1.0	0.32	0.37			
	35-46	35-55	1.35-1.60	0.06-0.20	0.09-0.17	Moderate	0.0-0.5	0.32	0.37			
	46-56	---	---	0.00-0.20	---	---------	---	---	---			
HyB:												
Hyatts----------	0-9	15-25	1.30-1.50	0.60-2.00	0.17-0.21	Low------	2.0-4.0	0.43	0.43	4	6	48
	9-50	35-42	1.40-1.70	0.06-0.60	0.10-0.17	Moderate	0.0-1.0	0.32	0.37			
	50-58	35-55	1.35-1.60	0.06-0.20	0.09-0.17	Moderate	0.0-0.5	0.32	0.37			
	58-68	---	---	0.00-0.20	---	---------	---	---	---			
JmA:												
Jimtown---------	0-10	10-24	1.30-1.50	0.60-2.00	0.18-0.22	Low------	2.0-3.0	0.32	0.37	5	5	56
	10-47	18-32	1.25-1.60	0.60-2.00	0.10-0.18	Low------	0.5-1.0	0.32	0.43			
	47-80	12-25	1.25-1.65	2.00-6.00	0.04-0.10	Low------	0.1-0.3	0.17	0.24			
LbF:												
Latham----------	0-3	20-27	1.30-1.50	0.60-2.00	0.16-0.20	Low------	1.0-3.0	0.43	0.49	3	6	48
	3-30	35-55	1.35-1.55	0.06-0.20	0.09-0.17	High-----	0.0-1.0	0.32	0.43			
	30-40	---	---	0.00-0.20	---	---------	---	---	---			
Brecksville-----	0-3	15-27	1.30-1.50	0.60-2.00	0.19-0.23	Low------	1.0-3.0	0.43	0.43	3	6	48
	3-22	30-40	1.40-1.60	0.20-0.60	0.10-0.18	Moderate	0.0-0.5	0.37	0.49			
	22-32	---	---	0.00-0.20	---	---------	---	---	---			
LeE:												
Leoni-----------	0-7	15-27	1.30-1.70	0.60-6.00	0.08-0.15	Low------	1.0-3.0	0.24	0.32	5	8	86
	7-37	10-35	1.30-1.70	0.60-6.00	0.07-0.15	Moderate	0.0-0.5	0.24	0.24			
	37-80	5-20	1.20-1.50	2.00-20.00	0.02-0.08	Low------	0.0-0.2	0.10	0.24			
LoA:												
Lobdell---------	0-9	15-27	1.20-1.40	0.60-2.00	0.20-0.24	Low------	1.0-3.0	0.37	0.37	5	5	56
	9-48	18-30	1.25-1.60	0.60-2.00	0.15-0.20	Low------	0.0-0.5	0.32	0.49			
	48-65	15-25	1.20-1.60	0.60-6.00	0.07-0.16	Low------	0.0-0.5	0.28	0.55			
LsA:												
Lobdell---------	0-11	15-27	1.20-1.40	0.60-2.00	0.20-0.24	Low------	1.0-3.0	0.37	0.37	5	5	56
	11-44	18-30	1.25-1.60	0.60-2.00	0.17-0.22	Low------	0.5-1.0	0.32	0.37			
	44-80	15-25	1.20-1.60	0.60-6.00	0.07-0.16	Low------	0.0-0.5	0.28	0.55			
Sloan-----------	0-8	20-27	1.30-1.50	0.60-2.00	0.19-0.24	Low------	3.0-6.0	0.28	0.28	5	6	48
	8-19	27-40	1.30-1.60	0.20-2.00	0.18-0.22	Moderate	3.0-6.0	0.28	0.28			
	19-25	15-35	1.25-1.60	0.20-2.00	0.16-0.22	Low------	0.5-2.0	0.32	0.32			
	25-64	15-30	1.25-1.60	0.60-2.00	0.08-0.18	Low------	0.5-2.0	0.32	0.37			
	64-80	27-35	1.50-1.75	0.06-0.60	0.07-0.12	Moderate	0.0-0.5	0.32	0.37			
LvB:												
Loudonville-----	0-12	13-22	1.30-1.50	0.60-2.00	0.16-0.20	Low------	1.0-3.0	0.32	0.37	2	5	56
	12-33	20-34	1.35-1.60	0.60-2.00	0.14-0.18	Moderate	0.0-1.0	0.32	0.37			
	33-34	---	---	0.00-2.00	---	---------	---	---	---			
LyD2:												
Lybrand---------	0-9	18-27	1.35-1.55	0.60-2.00	0.20-0.24	Low------	0.5-3.0	0.37	0.43	4	6	48
	9-33	35-50	1.55-1.75	0.06-0.20	0.12-0.19	Moderate	0.5-2.0	0.32	0.37			
	33-45	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	0.0-0.5	0.32	0.37			
	45-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	0.0-0.5	0.32	0.37			

Table 21.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in		Pct					
LyE2:												
Lybrand---------	0-7	18-27	1.35-1.55	0.60-2.00	0.20-0.24	Low------	0.5-3.0	0.37	0.43	4	6	48
	7-25	35-50	1.55-1.75	0.06-0.20	0.12-0.19	Moderate	0.5-2.0	0.32	0.37			
	25-37	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	0.0-0.5	0.32	0.37			
	37-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	0.0-0.5	0.32	0.37			
LzD3:												
Lybrand---------	0-2	27-35	1.35-1.50	0.20-0.60	0.20-0.22	Moderate	0.5-2.0	0.37	0.43	4	7	38
	2-15	35-50	1.55-1.75	0.06-0.20	0.12-0.19	Moderate	0.5-2.0	0.32	0.37			
	15-32	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	0.0-0.5	0.32	0.37			
	32-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	0.0-0.5	0.32	0.37			
MaB:												
Martinsville----	0-7	8-20	1.30-1.60	0.60-2.00	0.18-0.24	Low------	1.0-3.0	0.28	0.32	5	5	56
	7-40	20-33	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	0.0-0.5	0.32	0.37			
	40-80	15-30	1.40-1.65	0.60-2.00	0.10-0.19	Low------	0.0-0.5	0.24	0.24			
MbB:												
Martinsville----	0-11	10-22	1.30-1.40	0.60-2.00	0.20-0.24	Low------	1.0-3.0	0.37	0.37	5	5	56
	11-55	15-31	1.40-1.65	0.60-2.00	0.15-0.20	Moderate	0.0-0.5	0.37	0.37			
	55-65	5-20	1.55-1.65	0.60-6.00	0.06-0.12	Moderate	0.0-0.5	0.37	0.37			
	65-80	15-27	1.65-1.70	0.06-0.60	0.08-0.13	Low------	0.0-0.5	0.28	0.32			
McD2:												
Mentor----------	0-7	16-24	1.30-1.50	0.60-2.00	0.20-0.24	Low------	0.5-3.0	0.37	0.37	5	5	56
	7-62	16-35	1.40-1.60	0.60-2.00	0.18-0.20	Low------	0.0-0.5	0.37	0.37			
	62-80	13-25	1.20-1.50	0.60-2.00	0.12-0.18	Low------	0.0-0.5	0.37	0.37			
MfA:												
Millgrove-------	0-12	18-27	1.30-1.50	0.60-2.00	0.20-0.24	Low------	3.0-8.0	0.28	0.32	5	6	48
	12-38	18-35	1.40-1.70	0.60-2.00	0.12-0.16	Moderate	0.5-2.0	0.24	0.32			
	38-50	15-30	1.25-1.60	0.60-2.00	0.08-0.15	Low------	0.5-1.0	0.20	0.43			
	50-80	5-18	1.25-1.60	2.00-6.00	0.08-0.12	Low------	0.0-0.5	0.28	0.55			
MgA:												
Millgrove-------	0-15	27-32	1.35-1.55	0.60-2.00	0.19-0.23	Moderate	3.0-8.0	0.28	0.32	5	7	38
	15-45	18-35	1.40-1.70	0.60-2.00	0.12-0.16	Moderate	0.5-2.0	0.24	0.32			
	45-55	15-30	1.25-1.60	0.60-2.00	0.08-0.15	Low------	0.5-1.0	0.20	0.43			
	55-80	5-18	1.25-1.60	2.00-6.00	0.08-0.12	Low------	0.0-0.5	0.28	0.55			
MhA:												
Millgrove-------	0-10	27-35	1.30-1.50	0.60-2.00	0.18-0.22	Moderate	3.0-8.0	0.28	0.28	5	7	38
	10-27	18-35	1.40-1.70	0.60-2.00	0.12-0.16	Moderate	0.0-1.0	0.24	0.28			
	27-34	18-35	1.25-1.60	0.60-2.00	0.08-0.15	Low------	0.0-0.5	0.28	0.28			
	34-80	5-20	1.25-1.60	2.00-6.00	0.02-0.06	Low------	0.0-0.5	0.24	0.32			
MoB:												
Milton----------	0-10	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low------	1.0-3.0	0.37	0.37	2	6	48
	10-28	35-50	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	0.5-1.0	0.32	0.37			
	28-31	25-45	1.40-1.70	0.20-2.00	0.12-0.16	Moderate	0.0-0.5	0.32	0.37			
	31-32	---	---	0.00-0.60	---	---------	---	---	---			
MoC2:												
Milton----------	0-10	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low------	0.5-3.0	0.37	0.37	2	6	48
	10-28	35-50	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	0.5-1.0	0.32	0.37			
	28-29	---	---	0.00-0.60	---	---------	---	---	---			

Table 21.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in		Pct					
MpD2:												
Milton----------	0-8	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low------	0.5-3.0	0.37	0.37	2	6	48
	8-22	35-50	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	0.5-1.0	0.32	0.37			
	22-23	---	---	0.00-0.60	---	---------	---	---	---			
Lybrand---------	0-7	18-27	1.35-1.55	0.60-2.00	0.20-0.24	Low------	0.5-3.0	0.37	0.43	4	6	48
	7-30	35-50	1.55-1.75	0.06-0.20	0.12-0.19	Moderate	0.5-2.0	0.32	0.37			
	30-48	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	0.0-0.5	0.32	0.37			
	48-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	0.0-0.5	0.32	0.37			
PaA:												
Pacer-----------	0-14	14-27	1.30-1.50	0.60-2.00	0.20-0.23	Low------	3.0-5.0	0.37	0.37	5	6	48
	14-51	20-35	1.45-1.60	0.60-2.00	0.04-0.12	Moderate	1.0-3.0	0.28	0.43			
	51-80	14-27	1.65-2.00	0.01-0.60	0.07-0.12	Moderate	0.5-2.0	0.32	0.37			
PwA:												
Pewamo----------	0-13	27-40	1.35-1.55	0.60-2.00	0.20-0.23	Moderate	3.0-5.0	0.28	0.28	5	7	38
	13-57	35-50	1.40-1.70	0.20-0.60	0.12-0.20	Moderate	0.5-2.0	0.32	0.32			
	57-80	27-38	1.50-1.70	0.20-0.60	0.14-0.18	Moderate	0.0-1.0	0.32	0.37			
Pz:												
Pits.												
RdB2:												
Rarden----------	0-3	17-27	1.30-1.50	0.60-2.00	0.21-0.24	Low------	0.5-3.0	0.43	0.43	3	6	48
	3-33	35-60	1.50-1.70	0.06-0.20	0.10-0.14	High-----	0.0-1.0	0.32	0.43			
	33-43	---	---	0.00-0.20	---	---------	---	---	---			
RdC2:												
Rarden----------	0-3	17-27	1.30-1.50	0.60-2.00	0.21-0.24	Low------	0.5-3.0	0.43	0.43	3	6	48
	3-34	35-60	1.50-1.70	0.06-0.20	0.10-0.14	High-----	0.0-1.0	0.32	0.43			
	34-44	---	---	0.00-0.20	---	---------	---	---	---			
RdF2:												
Rarden----------	0-3	17-27	1.30-1.50	0.60-2.00	0.21-0.24	Low------	0.5-3.0	0.43	0.43	3	6	48
	3-38	35-60	1.50-1.70	0.06-0.20	0.10-0.14	High-----	0.0-1.0	0.32	0.43			
	38-48	---	---	0.00-0.20	---	---------	---	---	---			
RoA:												
Rossburg--------	0-20	13-27	1.20-1.50	0.60-2.00	0.19-0.24	Low------	4.0-8.0	0.37	0.37	5	6	48
	20-67	15-27	1.25-1.60	0.60-2.00	0.15-0.22	Low------	0.5-2.0	0.37	0.37			
	67-80	12-25	1.30-1.60	0.60-6.00	0.05-0.15	Low------	0.5-2.0	0.24	0.32			
RsA:												
Rossburg--------	0-12	13-27	1.20-1.50	0.60-2.00	0.19-0.24	Low------	4.0-8.0	0.37	0.37	5	6	48
	12-40	15-27	1.25-1.60	0.60-2.00	0.15-0.22	Low------	0.5-2.0	0.37	0.37			
	40-80	12-25	1.30-1.60	0.60-6.00	0.05-0.15	Low------	0.5-2.0	0.24	0.32			
Sloan-----------	0-15	15-27	1.20-1.40	0.60-2.00	0.19-0.24	Low------	3.0-6.0	0.28	0.28	5	6	48
	15-35	22-35	1.25-1.55	0.20-2.00	0.15-0.19	Moderate	0.5-1.0	0.32	0.37			
	35-80	10-30	1.20-1.50	0.20-2.00	0.13-0.18	Low------	0.0-0.5	0.32	0.43			
ScA:												
Scioto----------	0-10	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low------	1.0-3.0	0.37	0.43	5	6	48
	10-16	30-50	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	0.5-3.0	0.24	0.28			
	16-51	15-35	1.50-1.70	0.60-6.00	0.02-0.10	Low------	0.0-0.5	0.15	0.20			
	51-80	5-20	1.50-1.70	0.60-6.00	0.01-0.04	Low------	0.0-0.5	0.10	0.24			

Table 21.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in		Pct					
ScB:												
Scioto----------	0-12	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low------	1.0-3.0	0.37	0.43	5	6	48
	12-20	30-50	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	0.5-3.0	0.24	0.28			
	20-37	15-35	1.50-1.70	0.60-6.00	0.02-0.10	Low------	0.0-0.5	0.15	0.20			
	37-80	5-20	1.50-1.70	0.60-6.00	0.01-0.04	Low------	0.0-0.5	0.10	0.24			
SdC2:												
Scioto----------	0-5	27-33	1.35-1.55	0.60-2.00	0.19-0.23	Moderate	0.5-3.0	0.37	0.43	5	7	38
	5-15	30-50	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	0.5-3.0	0.24	0.28			
	15-55	15-35	1.50-1.70	0.60-6.00	0.02-0.10	Low------	0.0-0.5	0.15	0.20			
	55-80	5-20	1.50-1.70	0.60-6.00	0.01-0.04	Low------	0.0-0.5	0.10	0.24			
SfA:												
Scioto----------	0-14	14-27	1.30-1.50	0.60-2.00	0.20-0.23	Low------	1.0-3.0	0.37	0.43	5	6	48
	14-20	30-50	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	0.5-3.0	0.24	0.28			
	20-40	15-35	1.50-1.70	0.60-6.00	0.02-0.10	Low------	0.0-0.5	0.15	0.20			
	40-80	5-20	1.50-1.70	0.60-6.00	0.01-0.04	Low------	0.0-0.5	0.10	0.24			
SgA:												
Shoals----------	0-10	18-27	1.30-1.60	0.60-2.00	0.20-0.24	Low------	2.0-4.0	0.24	0.24	5	6	48
	10-29	18-27	1.40-1.70	0.60-2.00	0.15-0.22	Moderate	0.5-2.0	0.32	0.32			
	29-60	12-25	1.35-1.60	0.60-2.00	0.12-0.20	Low------	0.5-2.0	0.37	0.37			
SkA:												
Sloan-----------	0-12	15-27	1.20-1.40	0.60-2.00	0.19-0.24	Low------	3.0-6.0	0.28	0.28	5	6	48
	12-48	22-35	1.25-1.55	0.20-2.00	0.15-0.19	Moderate	0.5-1.0	0.32	0.37			
	48-80	10-30	1.20-1.50	0.20-2.00	0.13-0.18	Low------	0.0-0.5	0.32	0.43			
SnA:												
Sloan-----------	0-13	20-27	1.30-1.50	0.60-2.00	0.19-0.24	Low------	3.0-6.0	0.28	0.28	5	6	48
	13-19	27-40	1.30-1.60	0.20-2.00	0.18-0.22	Moderate	3.0-6.0	0.28	0.28			
	19-37	15-35	1.25-1.60	0.20-2.00	0.16-0.22	Low------	0.5-2.0	0.32	0.32			
	37-61	15-27	1.25-1.60	0.60-2.00	0.08-0.18	Low------	0.5-2.0	0.32	0.37			
	61-80	27-35	1.50-1.75	0.06-0.60	0.07-0.12	Moderate	0.0-0.5	0.32	0.37			
SoA:												
Sloan-----------	0-12	27-35	1.30-1.50	0.60-2.00	0.18-0.22	Moderate	3.0-6.0	0.28	0.28	5	7	38
	12-22	27-40	1.30-1.60	0.20-2.00	0.18-0.22	Moderate	3.0-6.0	0.28	0.28			
	22-47	15-35	1.25-1.60	0.20-2.00	0.16-0.22	Low------	0.5-2.0	0.32	0.32			
	47-75	15-30	1.25-1.60	0.60-2.00	0.08-0.18	Low------	0.5-2.0	0.32	0.37			
	75-80	27-35	1.50-1.75	0.06-0.60	0.07-0.12	Moderate	0.0-0.5	0.32	0.37			
SsA:												
Smothers--------	0-10	15-25	1.30-1.50	0.60-2.00	0.17-0.21	Low------	2.0-4.0	0.37	0.43	2	6	48
	10-22	35-45	1.40-1.70	0.06-0.60	0.10-0.17	Moderate	0.0-1.0	0.28	0.32			
	22-30	35-55	1.40-1.70	0.06-0.20	0.11-0.15	Moderate	0.0-1.0	0.32	0.37			
	30-31	---	---	0.00-2.00	---	---------	---	---	---			
SsB:												
Smothers--------	0-9	15-25	1.30-1.50	0.60-2.00	0.17-0.21	Low------	2.0-4.0	0.37	0.43	2	6	48
	9-29	35-45	1.40-1.70	0.06-0.60	0.10-0.17	Moderate	0.0-1.0	0.28	0.32			
	29-33	35-55	1.40-1.70	0.06-0.20	0.11-0.15	Moderate	0.0-1.0	0.32	0.37			
	33-34	---	---	0.00-2.00	---	---------	---	---	---			
StA:												
Stone-----------	0-12	27-35	1.15-1.45	0.20-0.60	0.18-0.22	Moderate	3.0-6.0	0.28	0.32	3	7	38
	12-20	27-40	1.30-1.55	0.20-0.60	0.14-0.18	Moderate	0.5-2.0	0.28	0.32			
	20-30	12-27	1.30-1.55	0.60-2.00	0.10-0.16	Moderate	0.5-1.0	0.28	0.32			
	30-42	12-27	1.35-1.60	0.60-6.00	0.04-0.10	Low------	0.0-0.5	0.20	0.28			
	42-43	---	---	0.00-0.60	---	---------	---	---	---			

Table 21.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in		Pct					
SuA:												
Stone-----------	0-12	27-35	1.15-1.45	0.20-0.60	0.18-0.22	Moderate	3.0-6.0	0.28	0.28	3	7	38
	12-29	27-40	1.30-1.55	0.20-0.60	0.14-0.18	Moderate	0.5-2.0	0.28	0.32			
	29-34	12-27	1.30-1.55	0.60-2.00	0.10-0.16	Moderate	0.5-1.0	0.28	0.32			
	34-44	12-27	1.35-1.60	0.60-6.00	0.04-0.10	Low------	0.0-0.5	0.20	0.28			
	44-45	---	---	0.00-0.60	---	---------	---	---	---			
Uc:												
Udorthents.												
UdB:												
Udorthents.												
Urban land.												
Up:												
Udorthents.												
Pits.												

Table 22.--Chemical Properties of the Soils

(Absence of an entry indicates that the data were not estimated)

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
AmD2:					
Amanda----------	0-9	12-27	10.0-20.0	4.5-7.3	---
	9-42	23-35	10.0-20.0	4.5-5.5	---
	42-80	15-25	6.0-16.0	6.6-8.4	0-22
AmE:					
Amanda----------	0-9	12-27	10.0-20.0	4.5-7.3	---
	9-43	23-35	10.0-20.0	4.5-5.5	---
	43-80	15-25	6.0-16.0	6.6-8.4	0-22
AmF:					
Amanda----------	0-8	12-27	10.0-20.0	4.5-7.3	---
	8-48	23-35	10.0-20.0	4.5-5.5	---
	48-80	15-25	6.0-16.0	6.6-8.4	0-22
BeA:					
Bennington------	0-10	15-25	12.0-20.0	4.5-7.3	---
	10-54	35-42	20.0-26.0	4.5-8.4	0-10
	54-80	24-33	9.0-20.0	7.4-8.4	10-20
BeB:					
Bennington------	0-9	15-25	12.0-20.0	4.5-7.3	---
	9-55	35-42	20.0-26.0	4.5-8.4	0-10
	55-80	24-33	9.0-20.0	7.4-8.4	10-20
BoA:					
Blount----------	0-9	22-27	17.0-22.0	5.1-7.3	---
	9-27	35-48	21.0-30.0	4.5-6.5	---
	27-38	27-40	16.0-25.0	6.1-7.8	0-25
	38-80	27-40	11.0-24.0	7.4-8.4	22-35
BoB:					
Blount----------	0-8	22-27	17.0-22.0	5.1-7.3	---
	8-32	35-48	21.0-30.0	4.5-6.5	---
	32-42	27-40	16.0-25.0	6.1-7.8	0-25
	42-80	27-40	11.0-24.0	7.4-8.4	22-35
CaB:					
Cardington------	0-8	12-27	12.0-18.0	4.5-7.3	---
	8-38	35-42	18.0-24.0	4.5-7.8	0-10
	38-80	24-33	9.0-20.0	7.4-8.4	8-22
CaC2:					
Cardington------	0-9	12-27	12.0-18.0	4.5-7.3	---
	9-43	35-42	18.0-24.0	4.5-7.8	0-10
	43-80	24-33	9.0-20.0	7.4-8.4	8-22
CeB:					
Centerburg------	0-6	10-22	6.0-18.0	4.5-7.3	---
	6-12	20-35	8.0-23.0	4.5-6.0	---
	12-50	25-35	10.0-22.0	5.1-7.8	0-10
	50-80	15-25	6.0-16.0	6.6-8.4	0-22
CeC2:					
Centerburg------	0-7	10-22	6.0-18.0	4.5-7.3	---
	7-31	25-35	8.0-23.0	5.1-7.8	---
	31-80	15-25	6.0-16.0	6.6-8.4	0-22

Table 22.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
CnA:					
Condit----------	0-10	18-27	14.0-26.0	4.5-7.3	---
	10-70	30-40	14.0-30.0	4.5-7.8	0-5
	70-80	27-36	9.0-22.0	7.4-8.4	5-20
EdA:					
Edwards---------	0-19	---	150-230	6.1-7.8	---
	19-80	3-6	1.0-10.0	7.4-8.4	50-90
GaC2:					
Gallman---------	0-7	10-25	8.0-20.0	4.5-7.3	---
	7-50	15-30	8.0-18.0	4.5-7.3	---
	50-80	15-27	3.0-10.0	6.1-8.4	5-20
GbA:					
Gallman---------	0-10	10-25	8.0-20.0	5.1-7.3	---
	10-56	15-30	8.0-18.0	4.5-7.8	---
	56-80	15-27	7.0-14.0	6.1-8.4	5-20
GbB:					
Gallman---------	0-9	10-25	8.0-20.0	5.1-7.3	---
	9-73	15-30	8.0-18.0	4.5-7.8	---
	73-80	15-27	7.0-14.0	6.1-8.4	5-20
GcB:					
Gallman---------	0-12	14-27	15.0-22.0	5.6-7.3	---
	12-60	10-35	10.0-20.0	4.5-7.3	---
	60-65	2-10	5.0-15.0	4.5-8.4	0-25
	65-80	27-35	5.0-15.0	7.9-8.4	15-25
GwB:					
Glynwood--------	0-8	16-27	12.0-22.0	4.5-7.3	---
	8-25	35-55	20.0-33.0	4.5-7.8	0-10
	25-33	27-40	11.0-27.0	6.1-8.4	0-35
	33-80	27-40	11.0-24.0	7.4-8.4	22-35
GwC2:					
Glynwood--------	0-7	16-27	12.0-22.0	4.5-7.3	---
	7-22	35-55	20.0-33.0	4.5-7.8	0-10
	22-36	27-40	11.0-27.0	6.1-8.4	0-35
	36-80	27-40	11.0-24.0	7.4-8.4	22-35
GzC3:					
Glynwood--------	0-7	27-38	12.0-20.0	4.5-7.3	---
	7-18	35-55	20.0-33.0	4.5-7.8	0-10
	18-36	27-40	11.0-27.0	6.1-8.4	0-35
	36-80	27-40	11.0-24.0	7.4-8.4	22-35
HeF:					
Heverlo---------	0-10	15-25	5.0-10.0	5.6-7.8	---
	10-27	35-45	15.0-25.0	5.6-7.3	---
	27-37	---	---	---	---
HyA:					
Hyatts----------	0-11	15-25	15.0-19.0	4.5-7.3	---
	11-35	35-42	18.0-25.0	4.5-7.8	---
	35-46	35-55	18.0-25.0	5.6-8.4	0-10
	46-56	---	---	---	---

Table 22.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
HyB:					
Hyatts----------	0-9	15-25	15.0-19.0	4.5-7.3	---
	9-50	35-42	18.0-25.0	4.5-7.8	---
	50-58	35-55	18.0-25.0	5.6-8.4	0-10
	58-68	---	---	---	---
JmA:					
Jimtown---------	0-10	10-24	10.0-18.0	4.5-7.3	---
	10-47	18-32	8.0-15.0	4.5-6.5	---
	47-80	12-25	6.0-12.0	5.1-8.4	0-10
LbF:					
Latham----------	0-3	20-27	6.0-17.0	3.5-5.5	---
	3-30	35-55	7.0-24.0	3.5-5.0	---
	30-40	---	---	---	---
Brecksville-----	0-3	15-27	8.0-22.0	3.5-5.5	---
	3-22	30-40	12.0-27.0	3.5-5.5	---
	22-32	---	---	---	---
LeE:					
Leoni-----------	0-7	15-27	10.0-20.0	7.4-8.4	0-5
	7-37	10-35	15.0-25.0	7.4-8.4	0-15
	37-80	5-20	2.0-10.0	7.4-8.4	10-40
LoA:					
Lobdell---------	0-9	15-27	8.0-17.0	5.1-7.3	---
	9-48	18-30	8.0-15.0	5.1-7.3	---
	48-65	15-25	7.0-13.0	5.6-7.3	---
LsA:					
Lobdell---------	0-11	15-27	8.0-17.0	5.1-7.3	---
	11-44	18-30	8.0-13.0	5.1-7.3	---
	44-80	15-25	7.0-13.0	5.6-7.3	---
Sloan-----------	0-8	20-27	20.0-32.0	6.1-7.8	---
	8-19	27-40	20.0-35.0	6.1-7.8	---
	19-25	15-35	10.0-20.0	6.1-8.4	0-20
	25-64	15-30	8.0-15.0	6.1-8.4	0-20
	64-80	27-35	5.0-15.0	7.9-8.4	15-25
LvB:					
Loudonville-----	0-12	13-22	8.0-18.0	4.5-7.3	---
	12-33	20-34	8.0-22.0	4.5-6.0	---
	33-34	---	---	---	---
LyD2:					
Lybrand---------	0-9	18-27	18.0-23.0	5.1-7.3	---
	9-33	35-50	16.0-25.0	5.1-8.4	0-20
	33-45	27-40	13.0-23.0	7.4-8.4	10-35
	45-80	27-40	13.0-18.0	7.9-8.4	22-35
LyE2:					
Lybrand---------	0-7	18-27	18.0-23.0	5.1-7.3	---
	7-25	35-50	16.0-25.0	5.1-8.4	0-20
	25-37	27-40	13.0-23.0	7.4-8.4	10-35
	37-80	27-40	13.0-18.0	7.9-8.4	22-35
LzD3:					
Lybrand---------	0-2	27-35	18.0-25.0	5.1-7.8	0-5
	2-15	35-50	16.0-25.0	5.1-8.4	0-20
	15-32	27-40	13.0-23.0	7.4-8.4	10-35
	32-80	27-40	13.0-18.0	7.9-8.4	22-35

Table 22.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
MaB:					
Martinsville----	0-7	8-20	5.0-16.0	5.1-7.3	---
	7-40	20-33	8.0-17.0	5.1-7.3	---
	40-80	15-30	2.0-12.0	5.6-7.8	0-10
MbB:					
Martinsville----	0-11	10-22	6.0-18.0	5.6-7.3	---
	11-55	15-31	8.0-20.0	5.1-7.3	---
	55-65	5-20	6.0-17.0	6.1-8.4	0-10
	65-80	15-27	3.0-9.0	7.4-8.4	5-25
McD2:					
Mentor----------	0-7	16-24	8.0-20.0	4.5-7.3	---
	7-62	16-35	8.0-20.0	4.5-6.5	---
	62-80	13-25	5.0-18.0	5.1-8.4	0-15
MfA:					
Millgrove-------	0-12	18-27	15.0-30.0	5.6-7.3	---
	12-38	18-35	10.0-18.0	6.1-7.8	---
	38-50	15-30	7.0-15.0	6.1-7.8	0-5
	50-80	5-18	3.0-10.0	7.4-8.4	10-25
MgA:					
Millgrove-------	0-15	27-32	20.0-32.0	5.6-7.3	---
	15-45	18-35	10.0-18.0	6.1-7.8	---
	45-55	15-30	7.0-15.0	6.1-7.8	0-5
	55-80	5-18	3.0-10.0	7.4-8.4	10-25
MhA:					
Millgrove-------	0-10	27-35	20.0-35.0	5.6-7.3	---
	10-27	18-35	15.0-30.0	6.1-7.8	0-5
	27-34	18-35	10.0-20.0	7.4-8.4	5-30
	34-80	5-20	5.0-12.0	7.4-8.4	15-40
MoB:					
Milton----------	0-10	14-27	10.0-22.0	4.5-7.3	---
	10-28	35-50	16.0-30.0	4.5-7.8	---
	28-31	25-45	10.0-27.0	6.1-8.4	5-15
	31-32	---	---	---	---
MoC2:					
Milton----------	0-10	14-27	10.0-22.0	4.5-7.3	---
	10-28	35-50	16.0-30.0	4.5-7.8	---
	28-29	---	---	---	---
MpD2:					
Milton----------	0-8	14-27	10.0-22.0	4.5-7.3	---
	8-22	35-50	16.0-30.0	4.5-7.8	---
	22-23	---	---	---	---
Lybrand---------	0-7	18-27	18.0-23.0	5.1-7.3	---
	7-30	35-50	16.0-25.0	5.1-8.4	0-20
	30-48	27-40	13.0-23.0	7.4-8.4	10-35
	48-80	27-40	13.0-18.0	7.9-8.4	22-35
PaA:					
Pacer-----------	0-14	14-27	15.0-21.0	5.6-7.3	---
	14-51	20-35	14.0-19.0	5.6-7.3	---
	51-80	14-27	11.0-18.0	7.4-8.4	10-25

Table 22.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
PwA:					
Pewamo----------	0-13	27-40	10.0-25.0	6.1-7.3	---
	13-57	35-50	10.0-20.0	5.6-7.8	0-5
	57-80	27-38	5.0-15.0	7.4-8.4	15-30
Pz:					
Pits.					
RdB2:					
Rarden----------	0-3	17-27	5.0-17.0	3.6-6.5	---
	3-33	35-60	7.0-26.0	4.5-7.8	---
	33-43	---	---	---	---
RdC2:					
Rarden----------	0-3	17-27	5.0-17.0	3.6-6.5	---
	3-34	35-60	7.0-26.0	4.5-7.8	---
	34-44	---	---	---	---
RdF2:					
Rarden----------	0-3	17-27	5.0-17.0	3.6-6.5	---
	3-38	35-60	7.0-26.0	4.5-5.5	---
	38-48	---	---	---	---
RoA:					
Rossburg--------	0-20	13-27	13.0-32.0	6.1-7.8	---
	20-67	15-27	8.0-22.0	6.1-7.8	---
	67-80	12-25	2.0-15.0	6.6-8.4	0-30
RsA:					
Rossburg--------	0-12	13-27	13.0-32.0	6.1-7.8	---
	12-40	15-27	8.0-22.0	6.1-7.8	---
	40-80	12-25	2.0-15.0	6.6-8.4	0-30
Sloan-----------	0-15	15-27	13.0-26.0	6.1-7.8	---
	15-35	22-35	10.0-20.0	6.1-8.4	0-20
	35-80	10-30	4.0-18.0	6.6-8.4	5-40
ScA:					
Scioto----------	0-10	14-27	15.0-22.0	5.6-7.3	---
	10-16	30-50	20.0-30.0	5.6-7.8	0-40
	16-51	15-35	10.0-20.0	6.6-8.4	0-60
	51-80	5-20	2.0-10.0	7.9-8.4	40-75
ScB:					
Scioto----------	0-12	14-27	15.0-22.0	5.6-7.3	---
	12-20	30-50	20.0-30.0	5.6-7.8	0-40
	20-37	15-35	10.0-20.0	6.6-8.4	0-60
	37-80	5-20	2.0-10.0	7.9-8.4	40-75
SdC2:					
Scioto----------	0-5	27-33	17.0-27.0	5.6-7.3	---
	5-15	30-50	20.0-30.0	5.6-7.8	0-40
	15-55	15-35	10.0-20.0	6.6-8.4	0-60
	55-80	5-20	2.0-10.0	7.9-8.4	40-75
SfA:					
Scioto----------	0-14	14-27	15.0-22.0	5.6-7.3	---
	14-20	30-50	20.0-30.0	5.6-7.8	0-40
	20-40	15-35	10.0-20.0	6.6-8.4	0-60
	40-80	5-20	2.0-10.0	7.9-8.4	40-75

Table 22.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
SgA:					
Shoals----------	0-10	18-27	12.0-27.0	6.6-7.8	0-5
	10-29	18-27	8.0-24.0	6.6-7.8	0-10
	29-60	12-25	3.0-19.0	6.6-8.4	0-25
SkA:					
Sloan-----------	0-12	15-27	13.0-26.0	6.1-7.8	---
	12-48	22-35	10.0-20.0	6.1-8.4	0-20
	48-80	10-30	4.0-18.0	6.6-8.4	5-40
SnA:					
Sloan-----------	0-13	20-27	20.0-32.0	6.1-7.8	---
	13-19	27-40	20.0-35.0	6.1-7.8	---
	19-37	15-35	10.0-20.0	6.1-8.4	0-20
	37-61	15-27	8.0-15.0	6.1-8.4	0-20
	61-80	27-35	5.0-15.0	7.9-8.4	15-25
SoA:					
Sloan-----------	0-12	27-35	20.0-35.0	6.1-7.8	---
	12-22	27-40	20.0-35.0	6.1-7.8	---
	22-47	15-35	10.0-20.0	6.1-8.4	0-20
	47-75	15-30	8.0-15.0	6.1-8.4	0-20
	75-80	27-35	5.0-15.0	7.9-8.4	15-25
SsA:					
Smothers--------	0-10	15-25	16.0-20.0	5.1-7.3	---
	10-22	35-45	19.0-27.0	5.6-7.8	---
	22-30	35-55	10.0-25.0	5.6-7.8	---
	30-31	---	---	---	---
SsB:					
Smothers--------	0-9	15-25	16.0-20.0	5.1-7.3	---
	9-29	35-45	19.0-27.0	5.6-7.8	---
	29-33	35-55	10.0-25.0	5.6-7.8	---
	33-34	---	---	---	---
StA:					
Stone-----------	0-12	27-35	20.0-35.0	6.1-7.8	---
	12-20	27-40	17.0-30.0	6.6-7.8	---
	20-30	12-27	10.0-25.0	6.6-8.4	0-25
	30-42	12-27	5.0-12.0	7.9-8.4	20-40
	42-43	---	---	---	---
SuA:					
Stone-----------	0-12	27-35	20.0-35.0	6.1-7.8	---
	12-29	27-40	17.0-30.0	6.6-7.8	---
	29-34	12-27	10.0-25.0	6.6-8.4	0-25
	34-44	12-27	5.0-12.0	7.9-8.4	20-40
	44-45	---	---	---	---
Uc:					
Udorthents.					
UdB:					
Udorthents.					
Urban land.					

Table 22.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
Up:					
Udorthents.					
Pits.					

Table 23.--Water Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydro-logic group	Flooding			High water table and ponding				
		Frequency	Duration	Months	Water table depth	Kind of water table	Months	Ponding duration	Maximum ponding depth
					Ft				Ft
AmD2, AmE, AmF:									
Amanda	C	None	---	---	3.5-6.0	Perched	Dec-May	---	---
BeA, BeB:									
Bennington	C	None	---	---	0.5-1.0	Perched	Nov-May	---	---
BoA, BoB:									
Blount	C	None	---	---	0.5-1.0	Perched	Nov-May	---	---
CaB, CaC2:									
Cardington	C	None	---	---	1.0-2.0	Perched	Nov-Apr	---	---
CeB, CeC2:									
Centerburg	C	None	---	---	1.0-2.0	Perched	Nov-Apr	---	---
CnA:									
Condit	D	None	---	---	0.0-1.0	Perched	Nov-May	Long	1.0
EdA:									
Edwards	B/D	None	---	---	0.0-1.0	Apparent	Sep-Jun	Very long	1.0
GaC2:									
Gallman	B	None	---	---	>6.0	---	---	---	---
GbA, GbB:									
Gallman	B	None	---	---	>6.0	---	---	---	---
GcB:									
Gallman	B	None	---	---	>6.0	---	---	---	---
GwB, GwC2:									
Glynwood	C	None	---	---	1.0-2.0	Perched	Jan-Apr	---	---
GzC3:									
Glynwood	C	None	---	---	1.0-2.0	Perched	Jan-Apr	---	---
HeF:									
Heverlo	B	None	---	---	>6.0	---	---	---	---
HyA, HyB:									
Hyatts	C	None	---	---	0.5-1.0	Perched	Nov-May	---	---
JmA:									
Jimtown	C	None	---	---	0.5-1.0	Apparent	Dec-May	---	---
LbF:									
Latham	D	None	---	---	1.0-2.0	Perched	Jan-Apr	---	---
Brecksville	C	None	---	---	>6.0	---	---	---	---
LeE:									
Leoni	B	None	---	---	>6.0	---	---	---	---
LoA:									
Lobdell	B	Occasional	Brief	Nov-Jun	1.0-2.0	Apparent	Nov-Jun	---	---

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table and ponding: Water table depth	Kind of water table	Months	Ponding duration	Maximum ponding depth
					Ft				Ft
LsA:									
Lobdell---------	B	Occasional	Brief-----	Nov-Jun	1.0-2.0	Apparent---	Nov-Jun	---	---
Sloan-----------	B/D	Occasional	Brief-----	Nov-Jun	0.0-1.0	Apparent---	Nov-Jun	Brief-----	1.0
LvB:									
Loudonville-----	C	None-------	---	---	>6.0	---	---	---	---
LyD2, LyE2:									
Lybrand---------	C	None-------	---	---	3.5-6.0	Perched----	Feb-Apr	---	---
LzD3:									
Lybrand---------	C	None-------	---	---	3.5-6.0	Perched----	Feb-Apr	---	---
MaB:									
Martinsville----	B	None-------	---	---	>6.0	---	---	---	---
MbB:									
Martinsville----	B	None-------	---	---	>6.0	---	---	---	---
McD2:									
Mentor----------	B	None-------	---	---	3.5-6.0	Apparent---	Feb-Mar	---	---
MfA:									
Millgrove-------	B/D	None-------	---	---	0.0-1.0	Apparent---	Nov-May	Brief-----	1.0
MgA:									
Millgrove-------	B/D	None-------	---	---	0.0-1.0	Apparent---	Nov-May	Brief-----	1.0
MhA:									
Millgrove-------	B/D	Rare-------	---	---	0.0-1.0	Apparent---	Nov-May	Brief-----	1.0
MoB, MoC2:									
Milton----------	C	None-------	---	---	>6.0	---	---	---	---
MpD2:									
Milton----------	C	None-------	---	---	>6.0	---	---	---	---
Lybrand---------	C	None-------	---	---	3.5-6.0	Perched----	Feb-Apr	---	---
PaA:									
Pacer-----------	B	None-------	---	---	2.0-3.5	Perched----	Nov-May	---	---
PwA:									
Pewamo----------	C/D	None-------	---	---	0.0-1.0	Apparent---	Dec-May	Brief-----	1.0
Pz:									
Pits.									
RdB2, RdC2, RdF2:									
Rarden----------	C	None-------	---	---	1.0-2.0	Perched----	Jan-Apr	---	---
RoA:									
Rossburg--------	B	Occasional	Very brief	Nov-Jun	3.5-6.0	Apparent---	Dec-Jan	---	---
RsA:									
Rossburg--------	B	Occasional	Very brief	Nov-Jun	3.5-6.0	Apparent---	Dec-Jan	---	---
Sloan-----------	B/D	Occasional	Brief-----	Nov-Jun	0.0-1.0	Apparent---	Nov-Jun	Brief-----	1.0
ScA, ScB:									
Scioto----------	B	None-------	---	---	>6.0	---	---	---	---

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table and ponding: Water table depth	High water table and ponding: Kind of water table	High water table and ponding: Months	High water table and ponding: Ponding duration	High water table and ponding: Maximum ponding depth
					Ft				Ft
SdC2:									
Scioto----------	B	None-------	---	---	>6.0	---	---	---	---
SfA:									
Scioto----------	B	Rare-------	---	---	>6.0	---	---	---	---
SgA:									
Shoals----------	C	Occasional	Brief-----	Oct-Jun	0.5-1.5	Apparent---	Jan-Apr	---	---
SkA:									
Sloan-----------	B/D	Occasional	Brief-----	Nov-Jun	0.0-1.0	Apparent---	Nov-Jun	Brief-----	1.0
SnA:									
Sloan-----------	B/D	Occasional	Brief-----	Nov-Jun	0.0-1.0	Apparent---	Nov-Jun	Brief-----	1.0
SoA:									
Sloan-----------	B/D	Occasional	Brief-----	Nov-Jun	0.0-1.0	Apparent---	Nov-Jun	Brief-----	1.0
SsA, SsB:									
Smothers--------	C	None-------	---	---	0.5-1.0	Perched----	Nov-May	---	---
StA:									
Stone-----------	C	None-------	---	---	0.5-1.0	Apparent---	Dec-May	---	---
SuA:									
Stone-----------	C	Rare-------	---	---	0.5-1.0	Apparent---	Dec-May	---	---
Uc:									
Udorthents.									
UdB:									
Udorthents.									
Urban land.									
Up:									
Udorthents.									
Pits.									

Table 24.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
AmD2, AmE, AmF:							
Amanda	>80	---	---	---	Moderate	Moderate	Moderate.
BeA, BeB:							
Bennington	>80	---	---	---	High	High	Moderate.
BoA, BoB:							
Blount	>80	---	---	---	High	High	Moderate.
CaB, CaC2:							
Cardington	>80	---	---	---	High	High	Moderate.
CeB, CeC2:							
Centerburg	>80	---	---	---	High	High	Moderate.
CnA:							
Condit	>80	---	---	---	High	High	Moderate.
EdA:							
Edwards	>80	---	4-12	25-30	High	High	Low.
GaC2:							
Gallman	>80	---	---	---	Moderate	Moderate	Moderate.
GbA, GbB:							
Gallman	>80	---	---	---	Moderate	Moderate	Moderate.
GcB:							
Gallman	>80	---	---	---	Moderate	Moderate	Moderate.
GwB, GwC2:							
Glynwood	>80	---	---	---	High	High	Moderate.
GzC3:							
Glynwood	>80	---	---	---	High	High	Moderate.
HeF:							
Heverlo	20-40	Soft	---	---	Moderate	High	Moderate.
HyA, HyB:							
Hyatts	40-60	Soft	---	---	High	High	Moderate.
JmA:							
Jimtown	>80	---	---	---	High	High	High.
LbF:							
Latham	20-40	Soft	---	---	High	High	High.
Brecksville	20-40	Soft	---	---	Moderate	High	High.
LeE:							
Leoni	>80	---	---	---	Low	Moderate	Low.
LoA:							
Lobdell	>80	---	---	---	High	Moderate	Moderate.

Table 24.--Soil Features--Continued

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
LsA:							
Lobdell----------	>80	---	---	---	High---------	Moderate-----	Moderate.
Sloan------------	>80	---	---	---	High---------	High---------	Low.
LvB:							
Loudonville------	20-40	Hard	---	---	Moderate-----	Moderate-----	High.
LyD2, LyE2:							
Lybrand----------	>80	---	---	---	High---------	High---------	Moderate.
LzD3:							
Lybrand----------	>80	---	---	---	High---------	High---------	Moderate.
MaB:							
Martinsville-----	>80	---	---	---	Moderate-----	Moderate-----	Moderate.
MbB:							
Martinsville-----	>80	---	---	---	Moderate-----	Moderate-----	Moderate.
McD2:							
Mentor-----------	>80	---	---	---	High---------	Moderate-----	High.
MfA:							
Millgrove--------	>80	---	---	---	High---------	High---------	Low.
MgA:							
Millgrove--------	>80	---	---	---	High---------	High---------	Low.
MhA:							
Millgrove--------	>80	---	---	---	High---------	High---------	Low.
MoB, MoC2:							
Milton-----------	20-40	Hard	---	---	Moderate-----	High---------	Moderate.
MpD2:							
Milton-----------	20-40	Hard	---	---	Moderate-----	High---------	Moderate.
Lybrand----------	>80	---	---	---	High---------	High---------	Moderate.
PaA:							
Pacer------------	>80	---	---	---	Moderate-----	High---------	Moderate.
PwA:							
Pewamo-----------	>80	---	---	---	High---------	High---------	Low.
Pz:							
Pits.							
RdB2, RdC2, RdF2:							
Rarden-----------	20-40	Soft	---	---	High---------	High---------	High.
RoA:							
Rossburg---------	>80	---	---	---	Moderate-----	Low----------	Low.
RsA:							
Rossburg---------	>80	---	---	---	Moderate-----	Low----------	Low.
Sloan------------	>80	---	---	---	High---------	High---------	Low.

Table 24.--Soil Features--Continued

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
ScA, ScB:							
Scioto	>80	---	---	---	Moderate	High	Moderate.
SdC2:							
Scioto	>80	---	---	---	Moderate	High	Moderate.
SfA:							
Scioto	>80	---	---	---	Moderate	High	Moderate.
SgA:							
Shoals	>80	---	---	---	High	High	Low.
SkA:							
Sloan	>80	---	---	---	High	High	Low.
SnA:							
Sloan	>80	---	---	---	High	High	Low.
SoA:							
Sloan	>80	---	---	---	High	High	Low.
SsA, SsB:							
Smothers	20-40	Hard	---	---	High	High	Moderate.
StA:							
Stone	40-60	Hard	---	---	High	High	Low.
SuA:							
Stone	40-60	Hard	---	---	High	High	Low.
Uc:							
Udorthents.							
UdB:							
Udorthents.							
Urban land.							
Up:							
Udorthents.							
Pits.							

Table 25.--Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Amanda	Typic Hapludalfs, fine-loamy, mixed, mesic
Bennington	Aeric Epiaqualfs, fine, illitic, mesic
Blount	Aeric Epiaqualfs, fine, illitic, mesic
Brecksville	Typic Dystrochrepts, fine-loamy, mixed, mesic
Cardington	Aquic Hapludalfs, fine, illitic, mesic
Centerburg	Aquic Hapludalfs, fine-loamy, mixed, mesic
Condit	Typic Epiaqualfs, fine, illitic, mesic
Edwards	Limnic Medisaprists, marly, euic, mesic
Gallman	Typic Hapludalfs, fine-loamy, mixed, mesic
Glynwood	Aquic Hapludalfs, fine, illitic, mesic
Heverlo	Typic Hapludalfs, fine, mixed, mesic
Hyatts	Aeric Epiaqualfs, fine, mixed, mesic
Jimtown	Aeric Endoaqualfs, fine-loamy, mixed, mesic
Latham	Aquic Hapludults, clayey, mixed, mesic
Leoni	Typic Hapludalfs, loamy-skeletal, mixed, mesic
Lobdell	Fluvaquentic Eutrochrepts, fine-loamy, mixed, mesic
*Loudonville	Ultic Hapludalfs, fine-loamy, mixed, mesic
Lybrand	Typic Hapludalfs, fine, illitic, mesic
Martinsville	Typic Hapludalfs, fine-loamy, mixed, mesic
Mentor	Typic Hapludalfs, fine-silty, mixed, mesic
Millgrove	Typic Argiaquolls, fine-loamy, mixed, mesic
Milton	Typic Hapludalfs, fine, mixed, mesic
Pacer	Oxyaquic Argiudolls, fine-loamy, mixed, mesic
Pewamo	Typic Argiaquolls, fine, mixed, mesic
Rarden	Aquultic Hapludalfs, fine, mixed, mesic
Rossburg	Fluventic Hapludolls, fine-loamy, mixed, mesic
Scioto	Typic Hapludalfs, loamy-skeletal, mixed, mesic
Shoals	Aeric Fluvaquents, fine-loamy, mixed, nonacid, mesic
Sloan	Fluvaquentic Endoaquolls, fine-loamy, mixed, mesic
Smothers	Aeric Epiaqualfs, fine, mixed, mesic
Stone	Aquic Hapludolls, fine-loamy, mixed, mesic
Udorthents	Udorthents, mesic
Udorthents, clayey	Udorthents, clayey, mesic

Interpretive Groups

Interpretive Groups

(See text for definitions of land capability subclass, prime farmland, woodland ordination symbol, and pasture and hayland suitability groups. Absence of an entry indicates that an interpretive group is not assigned)

Map symbol and soil name	Land capability subclass	Prime farmland code*	Woodland ordination symbol	Pasture and hayland suitability group
AmD2--- Amanda	4e	0	5R	A-1
AmE-- Amanda	6e	0	5R	A-2
AmF-- Amanda	7e	0	5R	A-3
BeA-- Bennington	2w	2	4A	C-1
BeB-- Bennington	2e	2	4A	C-1
BoA-- Blount	2w	2	3C	C-1
BoB-- Blount	2e	2	3C	C-1
CaB-- Cardington	2e	1	4A	A-6
CaC2--- Cardington	3e	0	4A	A-6
CeB-- Centerburg	2e	1	5A	A-6
CeC2--- Centerburg	3e	0	5A	A-6
CnA-- Condit	3w	2	5W	C-2
EdA-- Edwards	5w	0	2W	D-1
GaC2--- Gallman	3e	0	5A	A-1
GbA-- Gallman	1	1	5A	A-1
GbB-- Gallman	2e	1	5A	A-1
GcB-- Gallman	2e	1	5A	A-1
GwB-- Glynwood	2e	1	4C	A-6

See footnote at end of table.

Interpretive Groups--Continued

Map symbol and soil name	Land capability subclass	Prime farmland code*	Woodland ordination symbol	Pasture and hayland suitability group
GwC2: Glynwood	4e	0	4C	A-6
GzC3: Glynwood	4e	0	4C	A-6
HeF: Heverlo	7e	0	4R	H-1
HyA: Hyatts	2w	2	4A	C-1
HyB: Hyatts	2e	2	4A	C-1
JmA: Jimtown	2w	2	5A	C-1
LbF:	7e	0		
Latham			3R	H-1
Brecksville			3R	H-1
LeE: Leoni	6e	0	4R	B-1
LoA: Lobdell	2w	1	5A	A-5
LsA:	2w	1		
Lobdell			5A	A-5
Sloan			5W	C-3
LvB: Loudonville	2e	1	4D	F-1
LyD2: Lybrand	4e	0	4R	A-6
LyE2: Lybrand	6e	0	4R	A-2
LzD3: Lybrand	6e	0	4R	A-6
MaB: Martinsville	2e	1	5A	A-1
MbB: Martinsville	2e	1	5A	A-1
McD2: Mentor	4e	0	5R	A-6
MfA: Millgrove	2w	2	5W	C-1
MgA: Millgrove	2w	2	5W	C-1

See footnote at end of table.

Interpretive Groups--Continued

Map symbol and soil name	Land capability subclass	Prime farmland code*	Woodland ordination symbol	Pasture and hayland suitability group
MhA: Millgrove	2w	2	5W	C-1
MoB: Milton	2e	1	4D	F-1
MoC2: Milton	3e	0	4D	F-1
MpD2:	4e	0		
Milton			4R	F-1
Lybrand			4R	A-6
PaA: Pacer	1	1	5A	A-1
PwA: Pewamo	2w	2	5W	C-1
Pz: Pits	---	0	---	---
RdB2: Rarden	3e	1	4C	F-1
RdC2: Rarden	4e	0	4C	F-1
RdF2: Rarden	7e	0	3R	F-2
RoA: Rossburg	2w	1	5A	A-5
RsA:	2w	1		
Rossburg			5A	A-5
Sloan			5W	C-3
ScA: Scioto	2s	1	4F	B-1
ScB: Scioto	2e	1	4F	B-1
SdC2: Scioto	3e	0	4F	B-1
SfA: Scioto	2s	1	4F	B-1
SgA: Shoals	2w	2	5W	C-3
SkA: Sloan	3w	2	5W	C-3
SnA: Sloan	3w	2	5W	C-3

See footnote at end of table.

Interpretive Groups--Continued

Map symbol and soil name	Land capability subclass	Prime farmland code*	Woodland ordination symbol	Pasture and hayland suitability group
SoA: Sloan	3w	2	5W	C-3
SsA: Smothers	2w	2	4D	C-2
SsB: Smothers	2e	2	4D	C-2
StA: Stone	2w	2	5W	C-2
SuA: Stone	2w	2	5W	C-2
Uc: Udorthents	---	0	---	---
UdB:	---	0		
Udorthents			---	---
Urban land			---	---
Up:	---	0		
Udorthents			---	---
Pits			---	---

* Prime farmland codes:
0--Not prime farmland.
1--All areas are prime farmland.
2--Only drained areas are prime farmland.