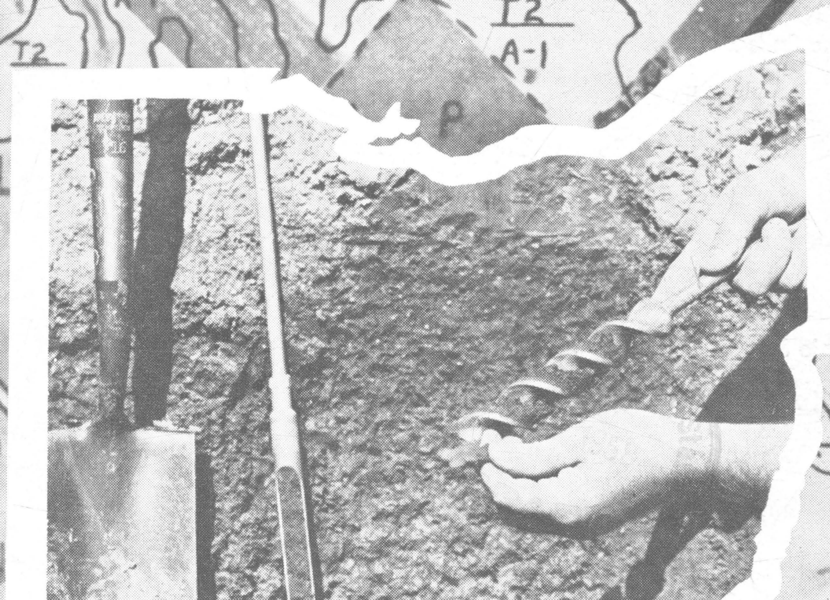
# Understanding Ohio Soils



Agricultural Extension Service
The Ohio State University

Bulletin 368

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**The authors: H. H. Morse is state soil scientist of the U. S. Soil Conservation Service, and Samuel Bone, Extension soil scientist of The Ohio State University.**

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# *Understanding* Ohio Soils

By H. H. Morse and Samuel Bone

Soils differ. Some are highly productive, and others are not. Some are good for one use but ill-adapted to another. Some sell for 10 times as much as others and still may be a better buy. Some will support a pavement under heavy traffic, while others fail.

Knowledge of the soils of an area can be useful in explaining or predicting their behavior. This knowledge can be used to apply the results of agricultural research to similar soils at other locations. Knowing soils also serves other purposes, such as the appraising of land or planning for highways, airports and foundations.

The study of soils in Ohio, as elsewhere, is a continuous one. Weather and climatic conditions cause slow but gradual changes in soil structure and composition. Scientific soil classifications change, too, nevertheless a knowledge of them is important in understanding Ohio soils.

## What Makes Soils Differ

Soils are products of the conditions under which they were developed and the material from which they were formed. Five major factors determine the kind of soil that results:

1. Kind of rock material
2. Topography and drainage of the land
3. Length of time that soil formation has taken place
4. Living and dead plants and animals in and on the soil
5. Climate, especially temperature and rainfall

For example, the soils of Ohio have developed under a humid, temperate climate. Contrasting conditions, elsewhere, have caused the development of greatly different soils in the desert, the tropics and in the tundra of the polar regions, even though some of these soils were formed from materials like those in Ohio. On the other hand, climate does not differ sufficiently within Ohio to produce great differences in soils; therefore climate is not generally used as a basis for separating kinds of soil within the state.

Variations in kinds of vegetation also have apparently produced some of the differences in soils in Ohio. There is some evidence that parts of the state were covered with prairie vegetation before the land was farmed, and early land surveyors reported areas of prairie grass.

Even today, soil surveys reveal small patches of prairie grass along roadsides and in other places missed by the plow. These plants tend to produce a dark colored surface soil, deeper than that produced under forest. A small percentage, perhaps two percent of Ohio soils, have this deep, dark surface soil which is attributed to grass vegetation.

The length of time soils have been forming has not been the same over all of Ohio. This is partly due to the occurrence of several glaciers and to the early development of some river drainage courses. The glaciers, as they passed, partially destroyed the existing soils and laid down new materials from which other soils were formed later.

These glaciers came thousands of years apart and covered slightly different territory in Ohio. This difference in time of soil formation is well illustrated in western Ohio, where lime has been leached to 10 feet below the surface on Clermont soils and to about 2½ feet on Crosby soils. The Clermont soils were formed on material deposited by an early glaciation which was not covered by the last glaciation. The depth to which lime has been leached is one measure of the age of soils.

Topography and drainage affect soil formation considerably. Some of the rain that falls on sloping land runs off. The effective rainfall is, therefore, the total amount of rain that falls minus that which runs off. Often this running water carries soil with it, thereby reducing the depth of soil remaining.

Water tends to accumulate in the low places, so the effective rainfall there is greater than that which has fallen. This tends to keep the soil moist for longer periods of time in the low places than on the sloping land and to allow more weathering and clay formation to occur there.

Since water running from higher ground may dissolve or suspend small amounts of minerals from the soil, the water which moves to lower ground may have a slightly different chemical composition than rain water. Such actions produce different soil, both physically and chemically, on the low ground than on the sloping land, even though the soils were formed on similar materials.

Parent materials is the stuff from which soils are made and is closely related to the geology of an area. This includes such material as rocks and the way they have been altered by weathering, glaciers, streams, etc. Geologists give an account of this development of Ohio in a book titled *Water in Ohio* (5)*. The following information taken from that book helps to explain why Ohio has many kinds of parent material.

* Numbers in parentheses refer to the reference list at the end of this bulletin.

Training in the recognition of soil characteristics helps to develop an understanding of soils and their potential uses.

## Geology of Ohio

All of Ohio was under the sea in ancient geological times. The fact that all the bed rock in Ohio is sedimentary is proof of this. The major rocks are limestone, shale and sandstone. The western half of the state is underlain chiefly by limestone, and the eastern half chiefly by shale and sandstone, with some strata of limestone in the extreme southeast.

Glaciers invaded Ohio many centuries ago and, at one time or another, covered all of the state except the southeastern part. One of the earliest glaciers, called the "Illinoian," covered western Ohio to the southern border and extended beyond the Ohio river into Kentucky. It ground up all soils in its path and mixed new rock material with them. Soil formation again took place on this material, called glacial drift.

Most of the area occupied by the Illinoian glaciation was covered again centuries later by another glaciation, called the "Wisconsin." This glacier missed some narrow strips along the outer edge of the area and a wider strip south of Hillsboro and Lebanon. Soil formation started anew on the glacial drift left by the Wisconsin glaciation. Thus, there are Ohio soils of various ages dating back to and before the glacial periods.

As the Wisconsin glacier receded, it stood for a time near the northern edge of the state. It blocked the drainage and caused a shallow lake over the northern edge and northwestern part of the state. Lacustrine (lake-laid) materials were left behind when the glacier melted and the lake receded.

Well developed river systems drained the land before the glaciers came into Ohio. These rivers had broad flood plains formed from alluvium, the sediment washed down from the watershed above. When the glaciers interfered with their outlets some of these rivers cut new channels. This left some of the valleys high and dry, with no large streams to continue the flooding and sedimentation usual to flood plains. These old alluvial areas are called "terraces" or "second bottoms."

Glacial rivers, formed by the melting of ice, sent huge quantities of water down some valleys, carrying large amounts of gravel, sand, silt and clay. The turbulent water sorted out the finer material and carried it far downstream but dropped the gravel fairly evenly across the valley. The later streams usually cut channels in this old alluvium and formed new flood plains at a lower level. Thorough weathering of these former flood plains has produced some of our important soils.

Active deposition by our present streams has left "recent alluvium" to which more material is added periodically during floods. This situation provides a special kind of parent material. It is chiefly topsoil washed from slopes of the watershed. The first bottom soils forming in these parent materials are sometimes called young soils, because deposition of new material occurs before soil development advances far. The resulting soils are not greatly different from the parent material.

All soils can be divided into two major kinds: organic and inorganic. Organic soils are formed from parent materials that are mostly plant materials rather than mineral matter. The Wisconsin glaciation left a few pockets where water stood most of the year. Vegetation growing there fell into water and accumulated. The raw plant materials in these pockets are called peat. This decomposes to form muck soils.

This rocky foundation is adequate structurally for residential development but is poorly suited for the location of a well and septic tank in close association. Cracks in the bedrock could easily result in contamination of local water supply.

Although the acreage of muck soils in Ohio is small, it is important for the vegetables produced on it.

These different geologic processes, by their selective sorting and deposition, have created more kinds of parent material than there are kinds of rock material in Ohio. They can be used to place the soils of Ohio into six broad groups based on the parent materials.

a. Soils of the first bottoms
b. Soils of the second bottoms or terraces
c. Soils of residual rock (undisturbed rock)
d. Soils on glacial drift
e. Soils of lacustrine origin
f. Soils chiefly from organic matter

# The Soils Profile

Man does not see soil formation taking place. Soil is formed slowly; some of Ohio's present soils have developed over hundreds or thousands of years.

Nevertheless, one can see soils in various stages of formation, from the extremely thin soil covered by lichens and mosses that cling to rock to the complete soil profile which is the full expression of the soil forming processes.

In brief, a soil profile is a side view appearance of the soil features, such as can be seen in a new deep roadcut or ditch. A fully developed soil profile will usually show three major layers or horizons. For convenience these three horizons are labeled the A, B, and C horizons, starting at the top.

The A horizon (topsoil) is the layer of maximum biological activity from which minerals or clays, or both, are removed by water. It is the layer in which most plant roots are found and is usually the highest in organic matter, since many plant parts decay in this layer. Most of the bacteria and fungi are here also. As a result, the A horizon usually has a darker color than the B horizon.

The B horizon (subsoil) is the layer of "accumulation." Dissolved and suspended materials of the A horizon commonly move into this horizon and are deposited. This horizon usually contains more clay than the horizon above or below.

Often the soil grains of this horizon form into blocks of soil from one-fourth to two inches across, rather than remain as single individual units. This arrangement is called blocky soil structure.

The C horizon is called parent material, since it is like that from which the soil was formed. It is less weathered, contains less roots, usually has less clay and is generally more compact than the A and B horizons.

There are variations from this fully developed profile. In some places erosion has removed all of the A horizon. On very steep slopes the B horizon may be very thin or has never been developed at all. The periodic deposition of "recent alluvium" may prevent full devel-

Good seedbed preparation depends upon an understanding of soils. Proper implement adjustment to soil conditions is essential.

opment of horizons, so the soil can be called all topsoil or all parent material, depending on one's viewpoint.

The characteristics of these horizons are the basis of soil classification. They vary from soil to soil. Some of the characteristics can be seen; others must be measured by laboratory methods. The acidity of each horizon is an example of the latter.

The A, B and C horizons are commonly subdivided as a convenience in describing and defining soils. This is done by adding numbers or letters to the major horizon, such as A1 or A2. Those interested in further details on soil profiles should consult the Soil Survey Manual (2) or a good textbook on soil science.

## Kinds of Profile

Several thousand kinds of soil have been mapped in the United States. The number identified in Ohio exceeds 400, and new soils are being added to the list as they are found. One of the major tasks of the soil scientist is to organize this detailed information in a form the public can use conveniently.

The study of Ohio soils indicates that soils which occur on similar topography and have similar drainage tend to have some other similarities as well. Accordingly, Ohio soils were divided into 10 groups on the basis of topography and internal drainage.

Ohio soil scientists have chosen to call these groups "drainage profile 1," "drainage profile 2," etc., and to use the profile number (0 to 9). (This is a local method adopted for use in Ohio. There are actually many more than 10 kinds of soil profiles in the state, and some of them are based on other features than topography or drainage. Some other states number their soil groups differently and use different groupings.)

## Drainage Profile 6

The outstanding features of soils in this group are that they are both shallow and well drained. The depth to the C horizon is generally less than 20 inches. Hence, the water holding capacity of the soil is small.

These soils usually occur on steep slopes where runoff is apt to be excessive and geological erosion—which occurs under natural cover, not influenced by man—has kept pace with the accumulation of soil material. There is little soil profile development under these conditions; the B horizon is thin, absent or poorly developed. Good aeration has oxidized the soil, and light, bright colors are the rule. The content of organic matter is usually small, due to aeration and oxidation.

Because of the erosion hazard on steep land, farmers use only a limited acreage of these soils for cropping. When so used, the land needs special measures for erosion control for its protection. Much of the land is in permanent pasture, and the rough, steeper areas are used for forests.

## Drainage Profile 5

This group includes well drained soils

Highways constructed with a knowledge of soil properties usually require a minimum of maintenance.

that have been developed on gravelly or sandy materials. They drain quite rapidly due to the high porosity of the underlying materials.

These soils have a limited water holding capacity and tend to be droughty, especially when the upper soil is sandy or gravelly. They usually occur on nearly level terraces, but some are found near the former edge of melting glaciers where water removed the finer materials and left gravel behind.

These soils are well adapted to early season crops, because they drain readily and warm up quickly in the spring. The production of midseason crops is sometimes below average due to the limited water holding capacity of the soil. The acreages of these soils in agricultural use is decreasing because of their desirability for airports, building sites and as a source of gravel.

## Drainage Profile 4

This group of soils includes all the well-drained soils that are not shallow to rock or gravel. Thus, they have a larger water holding capacity than profiles 5 and 6. They commonly have light, bright colored subsoils, free from mottling with gray or other dull colors.

Surface soils are light colored, except in the few places where prairie vegetation has produced a darker soil. Leaching has usually made them acid, even those that were formed from limestone or calcareous glacial drift. The reaction depends only partly on the parent material.

Their good drainage and favorable water holding capacity make these soils suitable for a wide variety of uses. Most of them have a limited supply of nitrogen, phosphorus, potash and calcium, but they respond well to treatment.

## Drainage Profile 3

This group is moderately well drained; that is, intermediate between profile 4 and profile 2. Mottling always occurs in these soils. On the more open soils, mottling occurs below 18 inches but not above that level.

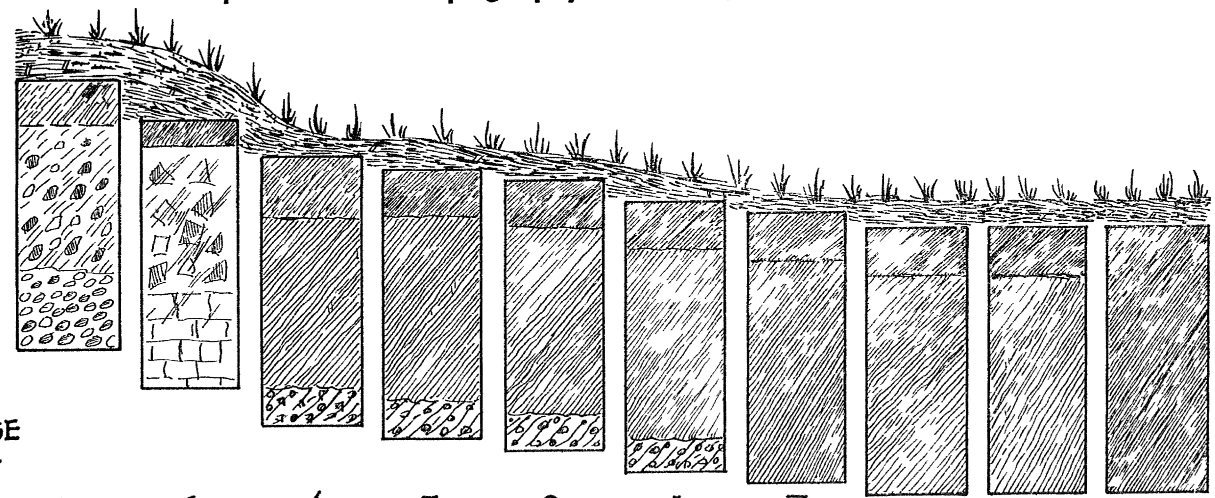
The mottled horizon on the tight soils occurs at about 8 inches, but this layer is only 6 to 8 inches thick, and there is little pronounced mottling below. It is believed that the latter condition is due to a "perched water table," a zone of soil that becomes saturated at times but later drains out. Soils with this kind of profile usually occur on gently rolling to rolling topography, a little less steep than profile 4 soils.

The use and adaptability of profile 3 soils are very much like the profile 4 soils, except that they drain more slowly. However, the drainage problem is usually not great enough to justify tiling the land, except in some special cases where high value crops are grown or it is necessary to dry the soil quickly to allow use of machinery in early spring or late fall.

## Drainage Profile 2

The soils with this kind of profile are called "imperfectly" or "somewhat poorly" drained. Strong mottling occurs at 7 or 8 inches and continues well into the subsoil, indicating that the soil is sometimes full of water long enough to prevent good aeration. Most of these soils have a moderately tight subsoil and are drained with difficulty. They

## Relationship of Soils to Topography According to Drainage Profiles




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DRAINAGE PROFILE | 5 | 6 | 4 | 3 | 2 | 1 | 7 | 8 | 9 | 0 |
| INTERNAL SOIL DRAINAGE | EXCESS-IVE | EXCESSIVE | GOOD | MODERATE | FAIR | POOR | VERY POOR | VERY POOR | VERY POOR | VERY POOR |
| WATER HOLDING CAPACITY | LOW | LOW | MEDIUM | MEDIUM | MEDIUM | MEDIUM | HIGH | VERY HIGH | VERY HIGH | VERY HIGH |

This example shows the pattern of all drainage profiles; however soil drainage profiles do not always occur in this order in the landscape, and only a few may be present on any one farm.

are commonly acid. Their natural fertility is fair.

The soils occur on level to gently sloping areas. Drainage is one of the major problems, so early season crops are not well adapted for use on these soils. Most of them drain eventually, even without tiling, but artificial drainage will speed up water removal.

## Drainage Profile 1

These soils are quite similar to the profile 2, except that they are one step lower in the drainage scale. They are poorly drained, with gray surface soils and a preponderance of gray mottling throughout. Dark colored concretions, which are about the size of BB shot, frequently occur on the surface and through the subsoil.

These soils are the most acid and least fertile of the soils that are formed from one kind of parent material. They occur on nearly level or flat areas and have relatively impervious subsoils.

These soils are difficult to drain. Surface drainage is usually used, but some tiling is done to permit farming operations in small areas that occur among other soils.

## Drainage Profile 7

Soils of profiles 7, 8 and 9 are very similar, all being poorly drained. There are slight differences in the color and depth of surface soil.

The soils of profile 7 have a dark gray surface soil and mottled yellowish brown and yellowish gray subsoils. They are not as acid as the associated gray soils, have slightly more organic matter and are more fertile. They occur on nearly level land or in slight depressions.

Soil conditions dictate foundation requirements.

## Drainage Profile 8

Most of the dark, very poorly drained soils have been placed in this group. The color of the moist surface soil is very dark gray. This color extends down 7 to 15 inches, below which strong mottling with gray and yellowish brown occurs. There is usually little change of texture with depth. These soils are high in organic matter, neutral or only slightly acid in reaction and naturally fertile. The texture of the surface soil is usually one class finer than the upland soils associated with them, but the subsoils are usually permeable because of the good development of soil structure in the subsoil.

Nearly all these soils must be tiled for best results, but they are highly productive and soon pay the cost of installation. Heavy cropping of the clay soils in this group creates a problem in maintaining good tilth. Good crop rotations and incorporation of organic matter appear to be the practical solution.

## Drainage Profile 9

The soils with this kind of a profile are like those of profile 8, except the surface is darker and the dark soil is deeper. The surface soil is gray-black and may be 18 or more inches in depth. The subsoil is mottled dark gray, gray and yellowish-brown. These soils are slightly more fertile than the profile 8 soils, but in other ways they are very similar.

## Drainage Profile 0

These soils are mucks, formed mainly from decomposed plant remains. They are very poorly drained and often show a deficiency of trace elements as well as a low content of potash. They are widely used for vegetable production.

# Catena, Series and Type

Soils formed on the same parent material are said to belong to the same "catena" if the climate, age and vegetation are uniform. The word "catena" is Greek, meaning chain. These soils are linked together, usually joining one another.

A catena may have soils representing six or seven drainage profiles, but more commonly has about four. It may only have one if conditions are not favorable for the development of the others.

In Ohio, the soils on one parent material, representing one drainage profile, constitute a soil series. This series is given a geographical name, such as Miami or Muskingum.

Each series contains soils that are alike except for texture of the surface soil. For example, the Muskingum series contains three soil types called Muskingum loam, Muskingum silt loam and Muskingum sandy loam. Soil texture refers to the size of the individual grains that make up the soil.

Success in landscaping and growth of vegetation is governed by the quality of soil material that is used.

## Soil Phases

Soil types are subdivided further in mapping to show other features, such as slope of the land, erosion and stoniness. Soil publications and maps frequently describe steep phases, eroded phases, stony phases, etc. They are useful for showing some features of the land within the soil type. Slope is commonly shown on maps by a letter, and erosion by a number. For further details see the Soil Survey Manual (2).

# Ohio System of Numbering Soils

The soils of Ohio are being mapped on aerial photos, commonly at a scale of four inches per mile. Ten acres on this scale occupies one-fourth of a square inch, a space much too small to write in "Muskingum silt loam, moderately steep, moderately eroded phase." Therefore the soil scientists abbreviate by using numbers and letters.

A typical symbol on a soil map might be G1045. Elements of this symbol are as follows:

**Phase.** Capital letters are used to represent phases. Here, G indicates a gravelly phase.

**Parent Material.** The first digit refers to parent material. The 1 indicates a first bottom material. Other first digits and the material they refer to are: 2 and 3—second bottom; 4 and 5—residual; 6, 7 and 8—glacial; and 9—lacustrine.

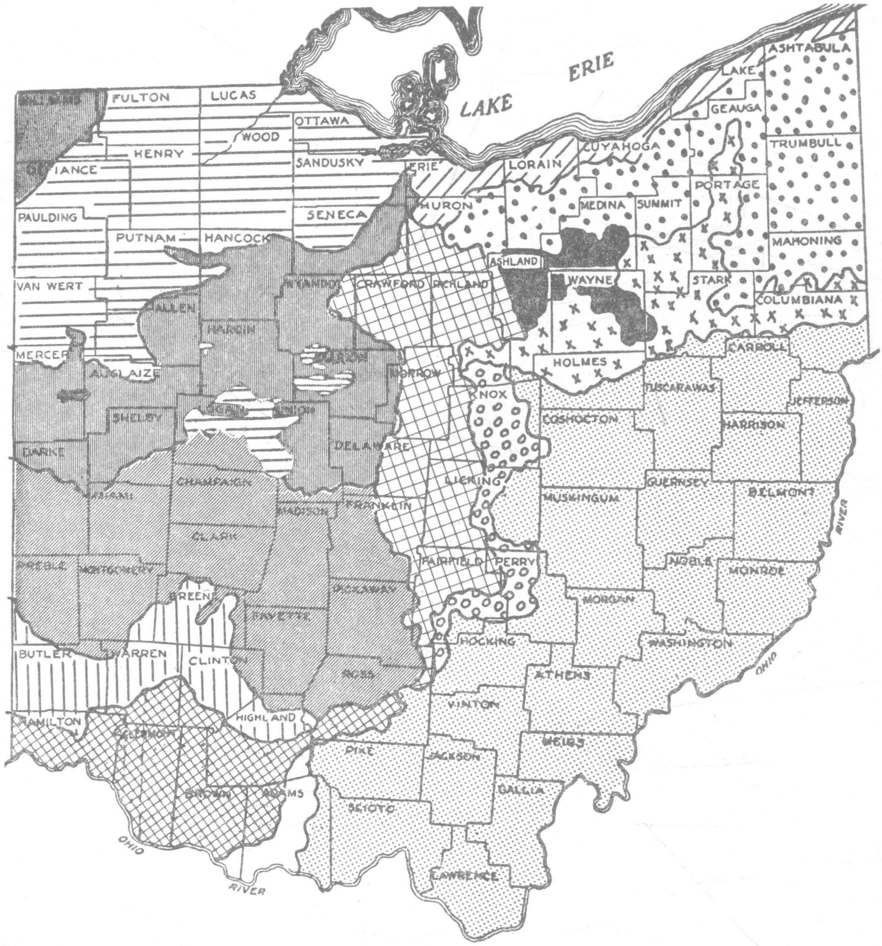
**Catena.** The second digit is a further subdivision of parent material and helps form the catena number. The digits 1 and 0, in the example, refer to the Genesee catena which contains first bottom soils in the glacial limestone area of the state.

**Drainage Profile.** The third digit, in this case 4, is the drainage profile number. Thus, digits 104 represent the profile 4 of the Genesee catena (Genesee silt loam).

**Texture.** A fourth digit is added to designate soil types other than a silt loam (all silt loam soils have a three-digit number) as follows: 0—sand, 1—loamy sand; 2—loamy fine sand; 3—sandy loam; 4—fine sandy loam; 5—loam; 6—silty clay loam; 7—clay loam; 8—silty clay; 9—clay. The 5 in the example, then, indicates a loam soil.

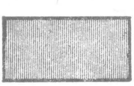
Thus the symbol G1045 is used for Genesee loam, gravelly phase. Furthermore, soil G1035 would be expected to be quite similar, except it would not be quite as well drained.

# Soil Areas of Ohio




This map, adapted from "Know Ohio's Soil Regions" by the Ohio Department of Natural Resources (1956), shows the parent material areas of the state (glaciated, lacustrine, residual, etc.) and some of the major soils of those areas. The various areas are identified on the following pages.

# Wisconsin Glaciated Areas



**Morley–Blount–Pewamo, and associated soils.**

These are light colored and dark colored soils developed from glacial till containing considerable limestone and clay. Generally, these soils require additional drainage, lime, fertilizer, and erosion control measures for efficient production. If the topsoil is removed from the light colored soils, a "clayey" layer is exposed that greatly reduces their productivity. This soil area is about average in productivity.

**Hoytville–Nappanee–Fulton–Toledo–Paulding–Latty–Tedrow–Granby–Plainfield–Rimer–Wauseon and associated soils.**

These are primarily dark colored soils developed from water assorted glacial till containing considerable limestone. Water assortment resulted in extreme variation in soils—from clays to sands. Generally, these soils required additional drainage—some lime and fertilizer for efficient production. Good management can overcome surface tillage problems. This soil area is above average in productivity.

**Miami–Celina–Crosby–Brookston, and associated soils.**

These are light colored and dark colored soils developed from glacial till of a "loamy" texture containing considerable limestone. Generally, these soils require additional drainage, some lime, fertilizer, and erosion control measures for efficient production. If the topsoil is removed from the light colored soils a "clayey" layer is exposed that greatly reduces their productivity. This soil area is about average in productivity.

**Russell–Xenia–Fincastle–Brookston–Reesville–Ragsdale, and associated soils.**

These are light colored and dark colored soils developed from glacial till of a "loamy" texture containing considerable limestone. Sometimes during the development of these soils they are covered by a rather thick layer of fine, silty material. Generally, these soils require additional drainage, some lime, fertilizer, and erosion control measures for efficient production. The silty surface is easy to work. This soil area is above average in productivity.

**Caneadea–Canadice–Lorain–Monroeville–Plainfield–Wilmer, and associated soils.**

These are light colored and dark colored soils developed from water assorted glacial till containing predominately sandstone and shale. Some are high in clay content, others are sandy. Generally, they require additional drainage, lime and fertilizer for efficient production. This soil area is a little below average in productivity.

**Ellsworth–Mahoning–Trumbull–Cambridge–Venango, and associated soils.**

These are light colored, strongly acid soils developed from glacial till containing sandstone and shale. Some areas of till contain considerable clay, other areas are "loamy" in texture. Generally, these soils require additional drainage, lime, and fertilizer for efficient production. This soil area is below average in productivity.

**Alexandria–Cardington–Bennington–Marengo, and associated soils.**

These are light colored and dark colored soils developed from glacial till containing fairly equal amounts of limestone, sandstone, and shale. Generally, these soils require additional drainage, lime, fertilizer, and erosion control measures for efficient production. This soil area is about average in productivity.

**Rittman–Wadsworth–Trumbull, and associated soils.**

These are light colored, strongly acid soils developed from glacial till containing shale, sandstone, and considerable clay. Generally, these soils require additional drainage, lime, fertilizer, and erosion control measures for efficient production. This soil area is below average in productivity.

**Wooster–Canfield–Ravenna–Trumbull, and associated soils.**

These are light colored, medium acid soils developed from glacial till containing sandstone and shale. Generally, these soils require additional drainage, lime, fertilizer, and erosion control measures for efficient production. This soil area is above average in productivity.

## Illinoian Glaciated Areas

**Cincinnati–Rossmoyne–Avonburg–Clermont–Jessup–Loudon–Edenton, and associated soils.**

These are light colored, strongly acid soils developed from glacial till of a "loamy" texture containing considerable limestone. These are the older glacial soils in Ohio and are leached of lime from 8 to 10 feet. Generally, these soils require additional drainage, lime, fertilizer, and erosion control measures for efficient production. This soil area is slightly below average in productivity.

**Hanover–Fallsburg, and associated soils.**

These are light colored, strongly acid soils developed from glacial till containing shale and sandstone. These are some of the older glaciated soils in Ohio. Generally, they require lime, fertilizer, and erosion control measures for efficient production. This soil area is below average in productivity.

## Unglaciated or Residual Areas

**Muskingum–Wellston–Keene–Upshur–Westmoreland–Meigs, and associated soils.**

These soils are developed on rather steep rolling topography in unglaciated areas of limestone, sandstone, and shale. They may be developed from one bedrock material or a combination of all three. The soils on the steeper slopes are quite shallow to bedrock. Areas that can be cultivated will require lime, fertilizer, and erosion control measures for efficient production. This soil area is a little below average in productivity.

**Fairmount–Maddox–Heitt–Bratton–Hagerstown–Cedarville, and associated soils.**

These soils are developed on rather steep, rolling topography in unglaciated areas of limestone and shale. They usually have a brown to reddish surface color. They may be quite shallow to bedrock. Areas that are uncultivated will require erosion control measures, some lime, and fertilizer for efficient production. This soil area is about average in productivity.

# Obtaining and Using Soil Information

The Division of Lands and Soils of the Ohio Department of Natural Resources, the Soil Conservation Service, the Ohio Agricultural Experiment Station and the Agricultural Extension Service of The Ohio State University are attempting to provide soils information on all land in the state, under guidance of the Ohio Soil Inventory Board.

Since the land surveyed increases from month to month it is not practical to attempt to show which lands have been surveyed. It is therefore suggested that those interested in a particular tract of land get in touch with one of the following:

1. Local county agricultural agent
2. Local soil conservationist of the Soil Conservation Service
3. Local soil scientist of the Soil Conservation Service
4. Local soil scientist of the Ohio Division of Lands and Soil
5. Ohio Soil Inventory Board, Agronomy Department, The Ohio State University
6. Ohio Agricultural Experiment Station
7. Department of Agronomy, The Ohio State University

# References


1. *Key to Ohio Soils.* Conrey, Paschall and Burrage. Special Circular 78, Ohio Agricultural Experiment Station. 1948
2. "Soil Survey Manual" Agriculture Handbook 18. United States Department of Agriculture. 1951
3. "Soils and Men." *Yearbook of Agriculture.* United States Department of Agriculture. 1938
4. *Nature and Properties of Soils.* Lyon, Buckman and Brady. McMillan Co. 1952
5. *Water in Ohio.* Stout. VerSteeg and Lamb. Bulletin 44, Geological Survey of Ohio. 1943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673 B-1
6786 A-0
673 B-1
673 B-1
673 B-1
MELKIN RD
T3 A-1
6786 A-0
T2 A-1
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673 B-1
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