Soil Horizons

Hetland Soil

Ap

Bt

Bk

C
Soil Horizons

“Horizon”: A layer of soil or soil material approximately parallel to the land surface and differing from adjacent related layers in physical, chemical, and biological properties or characteristics such as color, structure, texture, consistence, or pH.

“Profile”: Sequence of horizons stacked vertically that tells the story of how the soil formed.

“Series”: Name given to profile that has characteristic set of properties and horizons (determined by NRCS).
Soil Horizon Development

• A-Horizon development
  – Accumulation of organic matter
  – Clumping of individual soil particles
  – Distinct from parent material and other layers

• B and C horizon development
  – Carbonic and organic acids are carried by water into soil where they dissolve various minerals (transformations)
  – Clay films - thin layers of oriented trans-located clay
  – Salts and carbonates are carried by water and precipitate in the soil from upper to lower horizons (translocation)
  – Wetting and drying cracks soils and creates soil structure
  – Weathering of parent material
Master Horizons

- **O** = The layer of organic matter on the surface of a mineral soil
- **A** = Topsoil. The mineral soil horizon on the surface with organic matter and low clay
- **E** = The horizon of maximum leaching. Not in all soils, but if present, is located just below the “A” horizon; whitish color
- **B** = Subsoil. Horizon most often located below A horizon. The zone of maximum clay accumulation; salt accumulation
- **C** = Weathered rock. Lies below the “A” and/or “B” horizons and has NOT been acted upon by the soil forming processes
- **R** = The hard, consolidated rock beneath the soil
**O:** litter, forest floor; Oi common, ½-1" thick; Oa,Oe usually very thin or absent

**A:** topmost mineral soil; 2-12" typical; use “p” if abrupt boundary (tillage mark)

**E:** often absent due to erosion; may be light-colored, usually same texture as A; not blocky

Transition: usually only one– BE or EB; B often first, since more distinct

**B:** usually clayey, blocky, Fe coloration; 6-36" thick; may be subdivided (B1,B2); use t, w, or h– only one type per profile

Transition: usually BC (B more distinct)

**C:** weathered parent material; lower clay, massive/rock structure; if clear rock-like structure and appreciable rock fragments, use r (“Cr”)

**R:** hard rock (cannot be dug); describe type if possible
Horizon Suffixes

• **Subordinate Distinctions Within Master Horizons and Layers (Horizon Suffixes)**
  • a - Highly decomposed organic material where rubbed fiber content averages <1/6 of the volume.
  • b - Identifiable buried genetic horizons in a mineral soil.
  • e - Organic material of intermediate decomposition in which rubbed fiber content is 1/6 to 2/5 of the volume.
  • g - Strong gleying in which iron has been reduced and removed during soil formation or in which iron has been preserved in a reduced state because of saturation with stagnant water.
  • i - Slightly decomposed organic material in which rubbed fiber content is more than about 2/5 of the volume.
  • k - Accumulation of pedogenic carbonates, commonly calcium carbonate.
  • n - Accumulation of sodium on the exchange complex sufficient to yield a morphological appearance of a natric horizon.
  • p - Plowing or other disturbance of the surface layer by cultivation, pasturing or similar uses.
  • r - Weathered or soft bedrock including saprolite; partly consolidated soft sandstone, siltstone or shale; or dense till that roots penetrate only along joint planes and are sufficiently incoherent to permit hand digging with a spade.
  • ss - Presence of slickensides.
  • t - Accumulation of silicate clay that either has formed in the horizon and is subsequently translocated or has been moved into it by illuviation.
  • w - Development of color or structure in a horizon but with little or no apparent illuvial accumulation of materials.
  • y - Accumulation of gypsum.
  • z - Accumulation of salts more soluble than gypsum.
Houdek soil series  (SD State Soil)
Soil Horizon Designations

Tonka Soil

A

E

B

C

0
1
2
3