

Topic- Soil Profile and Horizons

Fundamental of Soil Science (NRH-111)

Instructor
Dr. R.K. Pathak
Assistant
Professor



Presented By
Dr. Ravindra Sachan
Teaching Associate

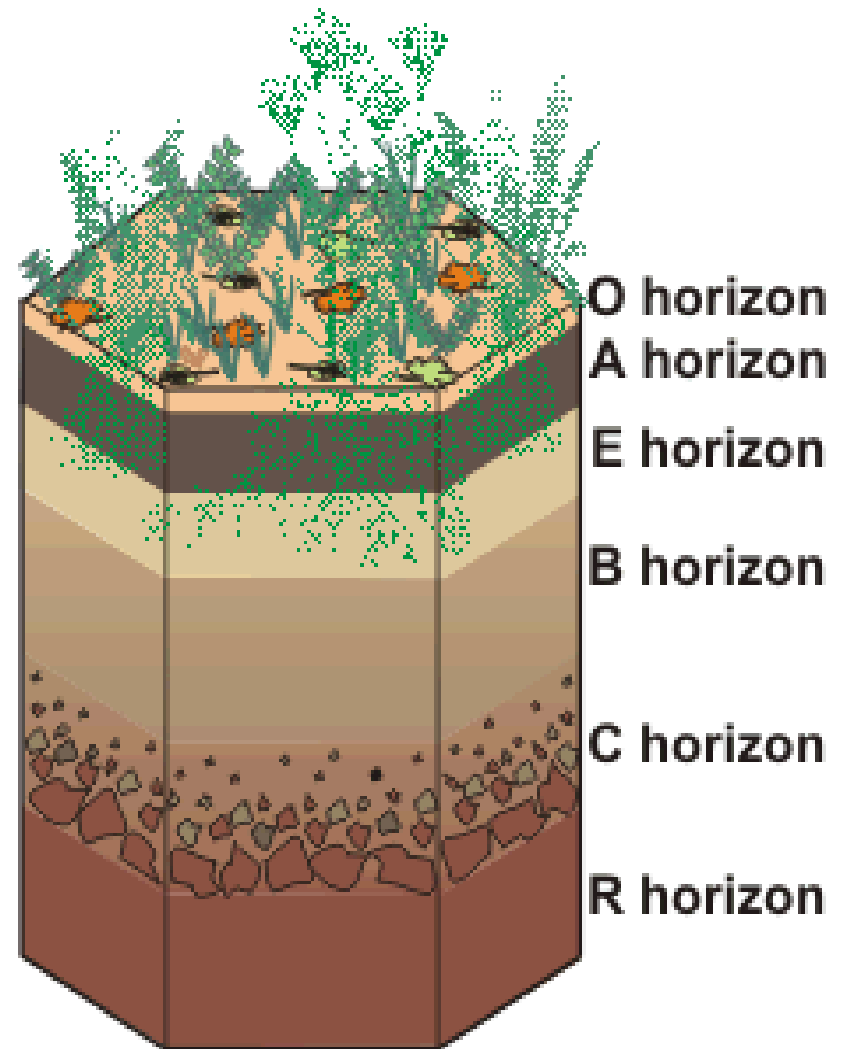
Department of Soil Science and Agricultural Chemistry C.S.A
UNIVERSITY OF AGRICULTURE AND TECHNOLOGY KANPUR(U.P.)
208002

Soil Profile And Horizon Nomenclature

Punitha B.C
PAK 9290

SOIL PROFILE

- Soil Profile is defined as vertical cross section of horizons of soil individual.



Importance of soil profile

- 🌐 ***In surveys:*** as typical example of soil mapping unit or of one of its components.
- 🌐 ***For research:*** as baseline record to illustrate the environmental setting and relationships between the soil attribute.
- 🌐 ***For land resource development:*** as base for building geo-referenced land information systems.

Development of horizons

Characters:

- **Inherent characters:** are those inherited from parent material hence, geological in nature.

Ex; quartz, mica, feldspar.

- **Aquired characters:** these are local in nature and are mainly due to process of soil formation.

Ex; Eluviation, Illuviation.

Soil horizon description

- ✿ Horizon designation and dimensions
- ✿ Soil colour
- ✿ Primary constituents
- ✿ Organization of the constituents
- ✿ Voids (porosity)
- ✿ Concentrations
- ✿ Biological activity
- ✿ Soil reaction
- ✿ Samples

Soil horizon description

Designation and dimensions

- ***Horizon symbol*** – O, A, E, B, C and R master horizon nomenclature, and the subordinate characteristics within master horizons and layers
- ***Horizon boundary*** – depth, distinctness and topography

Soil horizon description

Master horizon designation

Organic horizons

Are formed at the surface of the mineral soil resulting from decayed plant and animal products.

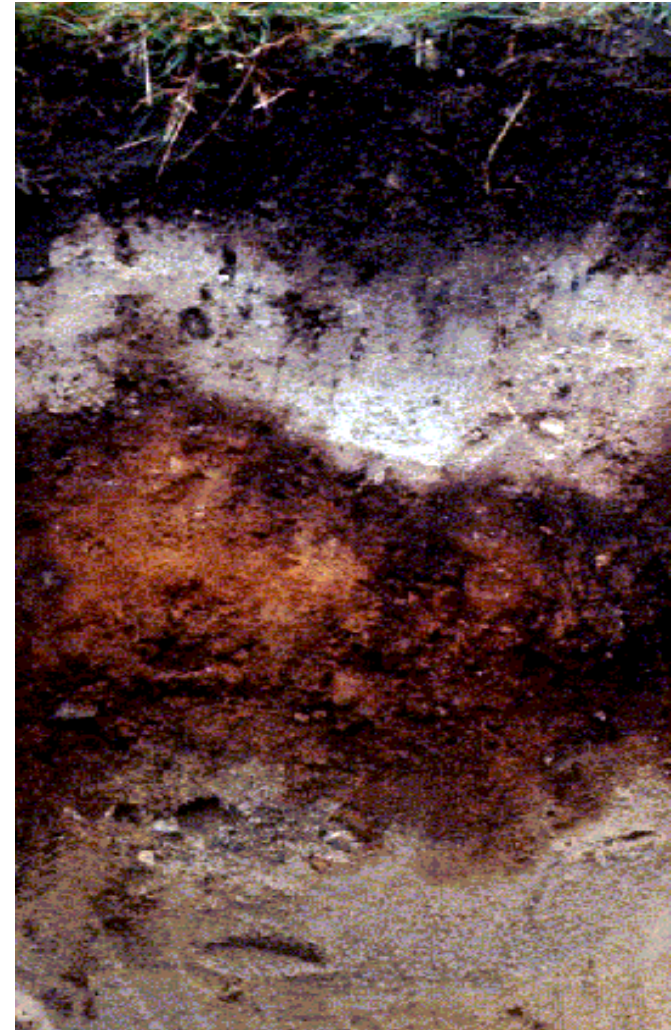


Soil horizon description

Master horizon designation

Mineral horizons:

- A** (organic matter)
- E** (eluviation)
- B** (illuviation)
- C** (parent material, unconsolidated)



Soil horizon description

Maste horizon designation

Mineral horizons:

R (parent rock)



Soil horizon description

Subordinate characteristics of master horizons:

- n** Accumulation of sodium
- o** Residual accumulation of sesquioxides
- p** Ploughing or other disturbance
- q** Accumulation of silica
- r** Strong reduction
- s** Illuvial accumulation of sesquioxides
- t** Accumulation of silicate clay

Soil horizon description

Subordinate characteristics of master horizons:

- c** Concretions or nodules
- f** Frozen soil
- g** Gleying evidenced by mottling
- h** Accumulation of organic matter
- j** Jarosite mottling
- k** Accumulation of carbonates
- m** Cementation or induration

Soil horizon description

Subordinate characteristics of master horizons:

- v** Occurrence of plinthite
- w** Development of colour or structure
- x** Fragipan character
- y** Accumulation of gypsum
- z** Accumulation of salts more soluble than gypsum

Soil horizon description

Based on Soil colour

- ✚ ***Matrix colour*** – hue, value and chroma, both dry and moist, according to the Munsell Soil Color Charts, or the Revised Standard Soil Color Charts
- ✚ ***Mottling*** – abundance, size, contrast, boundary and colour (dry and moist)

Based on Primary constituents

**** Texture of the fine earth fraction***

sand, loamy sand, sandy loam, loam, silt loam, silt, silty clay loam, silty clay, clay loam, sandy clay loam, sandy clay, clay.

**** Rock fragments*** – gravel, stones, boulders

Organization of soil constituents

- ***Soil structure***

- grade, size and type**

Types: single grain, massive, granular, prismatic, columnar, angular blocky, subangular blocky, platy, rock structure, stratified structure

- ***Consistence*** – dry, moist and wet

Voids (porosity)

Voids include all space in the soil. They are described in terms of:

- **Type**
- **Size**
- **Abundance**
- **Continuity**
- **Orientation**

Concentrations

- ***Cutanic features*** – clay, humus, pressure faces, slickensides and iron coatings.
- ***Cementation and compaction*** – continuity, structure, nature and degree.
- ***Mineral nodules*** – abundance, kind, size, shape, hardness, nature and colour.

Soil reaction

- ❖ ***Presence of carbonates*** – non-calcareous, slightly calcareous, moderately calcareous, strongly calcareous and extremely calcareous (tested with 10% HCl).
- ❖ ***Field pH*** – field pH meter, NaF test for volcanic soils.



Thank You...