



Centurion
UNIVERSITY

M.S.SWAMINATHAN
SCHOOL OF
AGRICULTURE

ASAC 1101 (2-1-0)

FUNDAMENTALS OF SOIL SCIENCE

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PRACTICAL MANUAL



Shaping Lives... Empowering Communities...

MSSSoA

Aim: To identify different horizons and study profile development.

Soil profile:

A vertical section through a soil is called profile. Soil horizon is a layer of soil, approximately parallel to the soil surface, with characteristics produced by soil – forming processes and is commonly differentiated from and adjacent one at least partly on the basis of characteristics that can be seen in the field.

A Hypothetical soil profile Soil profile includes O, A, B & C master horizons and all the possible sub horizons.

Materials required:

Shovel, khurpi, Dil. HCl, pH test kit, field guide for soil texture, structure, Munsell colour chart, metric tape, field note.

Procedure:

1. **Clean off the pit face to expose fresh soil.** Dig out the bottom of the pit to expose parent material.
2. **Describe soil horizons from top to bottom**, as follows:
 - A. Identify O horizons, if present; measure depth
 - B. Locate preliminary horizon boundaries based upon differences in texture, structure, and color, and mark with nails. Assign each horizon a master horizon designation (e.g. A, E, B, C).
 - C. For each preliminary mineral horizon, perform the following determinations:
 - a. Soil structure –grade, size and shape
 - b. Soil texture using field guide
 - c. Soil color using the Munsell color chart
 - d. Per cent coarse fragments in each soil horizon
 - e. pH of each mineral horizon using soil pH test kit and guide
 - f. Presence of mottling.
 - D. Apply master and subordinate horizon designations, as appropriate, based upon soil description just completed.

- E. Determine upper boundary of the C horizon using HCl test for carbonates. Note degree of effervescence.
- F. Record depths of each mineral horizon using the surface of mineral soil as a zero point. (e.g. A 0-10 cm, B 10-30 cm).
- G. Describe the (lower) boundary of each mineral horizon, including distinctness and topography.

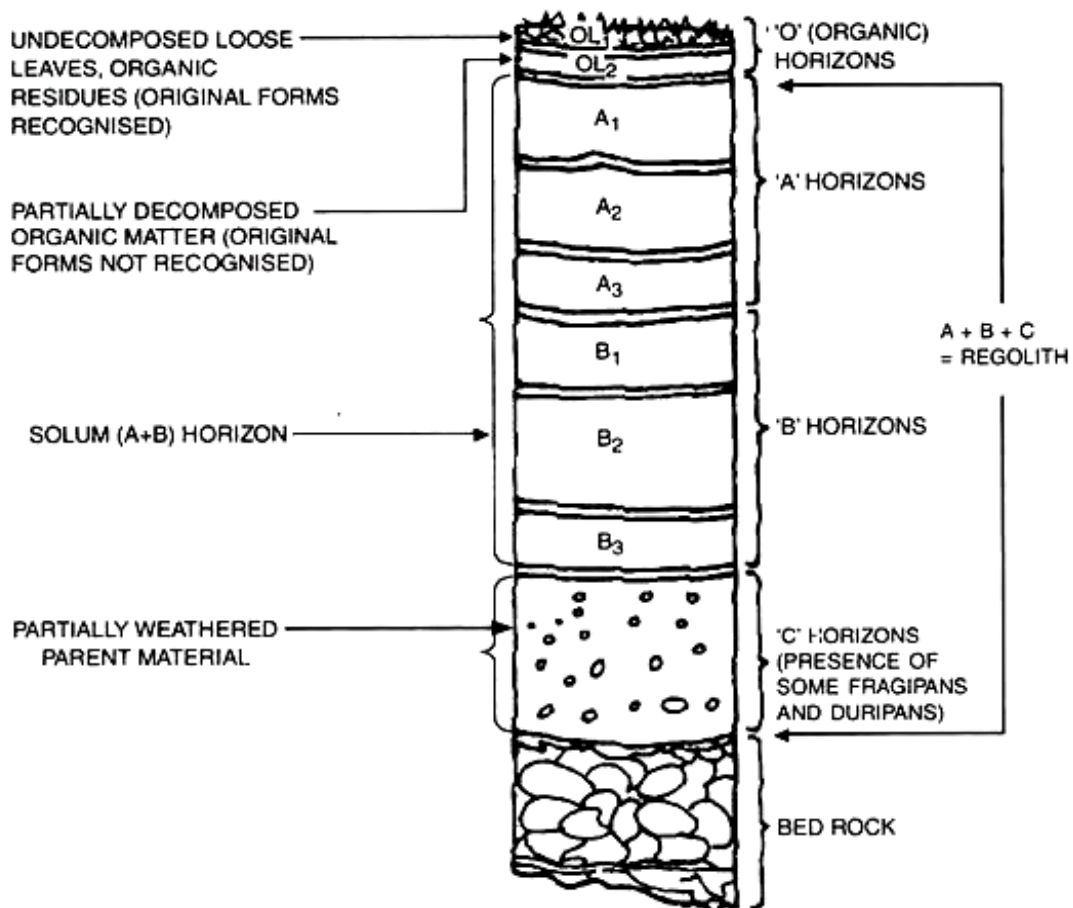
3. Complete the site description form : Making notes on landform, topography and vegetation, nutrient regime, drainage, and ecological moisture regime.

Work done:

Studied soil profiles of different soil orders and identified soil horizons.

ASAC 1101 (2+1) for record

Draw **FIGURE** using **PENCIL** in **BLANK SIDE** of the record and **MARK** the details clearly



- A₁ - Zone of maximum humus accumulation. (Mineral – mixed with humus)
- A₂ or E - **Zone of maximum eluviation** (silicate clays, Fe, Al-oxides, etc.,)
- A₃ - Transition to B, more like A than B.
- B₁ - Transition to A, more like B than A.
- B₂ - **Zone of illuviation** (silicate clays Fe, Al-oxides, some organic matter)
- B₃ - Transition to C. Mineral horizon. Accumulation of Ca, Mg carbonate.