The soil characterization lab at FAFS, AUB, supports faculty, researchers and students working in the fields of soil and water sciences.

The facility characterizes soils’ hydro-structural and chemical properties and the anthropogenic impact on soil quality, water, and nutrient holding capacities and their transport.

The lab supports teaching graduate courses including:

**Fertilizer Technology and Use:**
Fertilizers in agricultural development, current developments in fertilizer technology, fertigation, special problems associated with fertilizer use, and research methodology in soil fertility.

**Methods of Soil and Plant Tissue Analysis:**
Analytical techniques, operation of instruments in plant analysis, and physical, chemical, and mineralogical analysis of soils.

**Advanced Soil Physics:**
Physical properties of soils; soil-water-plant-atmosphere relationships, plant water extraction, and evapotranspiration; salt and water flow in soils, soil heat flow, and modeling soil water extraction and evaporation.

**Integrated Water Resource Management:**
Quantitative methods for analyzing water resource problems. Topics covered include the design and management of facilities for river basin development, flood control, water supply, hydropower, and other activities related to water resources.

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Soil physical properties

**Hydrostructural Pedology** is a new paradigm in soil science that grew naturally from the application of systems theory to soil science. It addresses not only the organization of soil in the landscape (soil mapping), but also the hierarchical internal organization of the soil medium.

The Soil Characterization Lab will serve research on hydrostructural pedology, characterizing the pedostructural properties of soil and organizing the data in relation to field operations (soil sampling, mapping, experiments) and the geo-referenced soil information system.

**Equipment**

- **Typosoil® Apparatus**
- **Linear shrinkage apparatus**
  - Determination of the total linear shrinkage and the plastic properties of soils
- **Hyprop**
  - Automatic determination of unsaturated hydraulic conductivity of undisturbed soil samples and water potential in the wet range
- **Water potentiometer**
  - Determination of the water potential of soil in the dry range
- **Pressure plate extractor**
  - Analysis of water-holding characteristics of soil samples

Soil chemical properties

Determinations include, but are not limited to, soil available nutrients, heavy metals and soil contaminants, organic matter (OM), pH, Electrical Conductivity (EC), Cation-Exchange Capacity (CEC), calcium carbonate, and plant tissue analysis.

**Equipment**

- **Flame photometer**
  - Determines levels of minerals and fertilizers in solutions, plant tissue, and water
- **Atomic absorption photometer**
- **Color photometer**
  - Colorimetric determination of minerals in soil and water
- **Multi-parameter meter**