

A list of methods to be used for the soil sample analysis

Sample preparation

Sample preparation according to ISO 11464:2006/2020 Soil quality — Pretreatment of samples for physico-chemical analysis.

Laboratory analysis

1. pH

Soil pH measured in a suspension of water and 1 M KCl according to ISO standard ISO 10390:2021 Soil, treated biowaste and sludge – Determination of pH.

2. Total Carbon content (C_t)

Total carbon content measured on automatic CN analyser using Dumas according to ISO 10694:1995 Soil quality — Determination of organic and total carbon after dry combustion (elementary analysis).

3. Total carbonate content ($CaCO_3$)

Total carbonate content measured using USDA method by Gravimetric Loss of Carbon Dioxide.

Total organic carbon content (C_{org})

In calcareous soils Total organic carbon content is calculated based on a difference between total carbon and total inorganic carbon (derived from $CaCO_3$ content).

4. Nitrogen content (N_t)

Total nitrogen content analysed using Dumas dry combustion method ISO 13878:1998(en) Soil quality — Determination of total nitrogen content by dry combustion ("elemental analysis").

5. Mass after drying (Dry mass)

Dry mass of soil determined ISO 11465:1993/2024 Soil quality — Determination of dry matter and water content on a mass basis — Gravimetric method.

6. Available Phosphorus content (P Mehlich 3)

Available Phosphorus content measured in the Mehlich 3 extract.

7. Calcium exchange capacity (Ca exch)

Exchangeable calcium determined using ISO/TS 22171:2023 Soil quality — Determination of potential cation exchange capacity (CEC) and exchangeable cations buffered at pH 7, using a molar ammonium acetate solution.

8. Magnesium exchange capacity (Mg exch)

Exchangeable magnesium determined using ISO/TS 22171:2023 Soil quality — Determination of potential cation exchange capacity (CEC) and exchangeable cations buffered at pH 7, using a molar ammonium acetate solution.

9. Potassium exchange capacity (K exch)

Exchangeable potassium determined using ISO/TS 22171:2023 Soil quality — Determination of potential cation exchange capacity (CEC) and exchangeable cations buffered at pH 7, using a molar ammonium acetate solution.

10. Extractable Aluminium (Al exch)

Exchangeable aluminium determined in 1M potassium chloride extraction

11. Bulk density

Dry mass of undisturbed samples taken with volumetric cylinders in a field condition determined by ISO 11465:1993/2024 Soil quality — Determination of dry matter and water content on a mass basis — Gravimetric method.

12. Texture

Soil particle size distribution determined using Pario automated soil texture particle size analyser and classified according to IUSS/WRB Soil Classification. Clay has to be measured and coarse silt may be calculated.