

Soil Organic Matter Analysis

Sample Collection

You will need a soil coring tool, spatula, or knife and small paper bags (one per sample).

- At each random sample point, push the soil coring tool into the soil and pull it back up to obtain a column of soil. Measure down from the top of the column 5 cm, cut the column and use this top portion of the column for your sample.
- Place the sample in a paper bag, labeled with the date, location, and treatment of the sample.
- Bring your samples back to Noyce and arrange for an instructor to put them in a drying oven for you.

Sample Processing

You will need porcelain crucibles, a muffle furnace set at 400°C (in Science 1611), a drying oven set at 105°C, tongs, gloves, and an analytical balance.

Precautions: Be very careful inserting and removing samples from the muffle furnace, as the high temperature can cause severe burns. Handle the porcelain crucibles with care, as they are quite fragile if dropped.

1. Dry your soil sample in the drying oven for a minimum of 24 hours. After drying, crumble the sample with your hands and pass it through a 2-mm sieve to remove large fragments of organic and inorganic material.
2. Determine the tare (empty) weight of your numbered crucibles to 0.1 mg. Add enough soil to the crucible to cover the bottom to a depth of several mm and reweigh to the nearest 0.1 mg. This is your “dry weight”.
3. Carefully place the sample into the pre-heated muffle furnace and ash for 1 hour.
4. Carefully remove the sample and allow it to cool to room temperature. Do not set the hot crucible onto a flammable (or meltable) surface until cool. Determine the “ash weight” to the nearest 0.1 mg when cool.
5. The LOI (Loss On Ignition) content is calculated as:
$$\%LOI = (\text{Dry weight} - \text{Ash weight}) / \text{Dry weight} \times 100$$
6. Be sure to turn off the furnace and wash the crucibles when your analysis is completed.