

# Soil sampling protocol

Testing for Life

Fertiliser Manager

Soil Health Indicator

Soil Carbon Check

Soil Life Monitor

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## Definitions

Sample	Final material of the sampling procedure; it can consist of combined sub-samples, in total 1 litre.
Sub-sample	One sub-sample taken with the sampling device; several sub-samples together make a composite sample.
Soil heterogeneity	Variation in one or more soil constituents in the field or area.
GPS	Global Position System: this system will provide coordinates with which you can relocate earlier sampled locations (WGS84 system).
Area (unit)	1 ha = 10.000 m <sup>2</sup> ; 1 feddan = 0.42 ha; 1 acre = 0.4 ha

## When to sample

- The optimal time for sampling is when plant growth is dormant (for example, in grasslands) or when no crops are present, apart from green manures. In natural areas, forestry, plantations and perennial cropping systems, sampling can be carried out throughout the year. For Soil Life Monitor and biological characteristics, it is recommended to take samples during autumn or winter, when temperatures are lower and the soil food web is more stable. For multi-year monitoring, samples should be taken under similar conditions (in terms of weather and timing).
- Avoid sampling immediately after field operations such as tilling, liming, fertilisation, or harvesting. Wait at least six weeks after these activities to ensure accurate results.
- Check weather conditions before sampling, as factors like deep frost, snow, or heavy rain can influence both sample collection and analysis outcomes. The availability of plant nutrients is significantly affected by precipitation and extreme temperatures.

## How to take a sample?

### Preparation

- Understand the location and its variability
- Ensure you can collect a representative sample and that the same location can be re-sampled in the short- or long-term
- Gather your material:
  - Soil sampler
  - Clean bucket
  - Sample bag
  - Waterproof marker pen
  - Optional: GPS device or phone with GPS app

### Representative sampling

- The sample collected must accurately represent the area being analysed, with a maximum size of 5 hectares.
- To achieve this, take approximately 40 sub-samples evenly distributed across the area.
- Mix the sub-samples thoroughly to create a representative composite sample.
- For future re-sampling, record the sampled location using a GPS device.
- Record the coordinates of the central point of the sampled area (refer to Figures 1 and 2).

### Dealing with field variability

- If the soil in your field exhibits significant variation (heterogeneous, Figure 1), limit the sampled area to a maximum of 1 hectare.
- If the field is relatively uniform (homogeneous, Figure 2), a single sample can represent the entire area.
- Always record the GPS coordinates of the central point of the sampled area to ensure consistency in future sampling efforts.

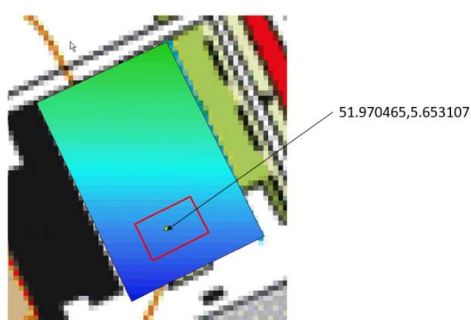


Figure 1: A heterogeneous field; therefore, sample a smaller area within the field.

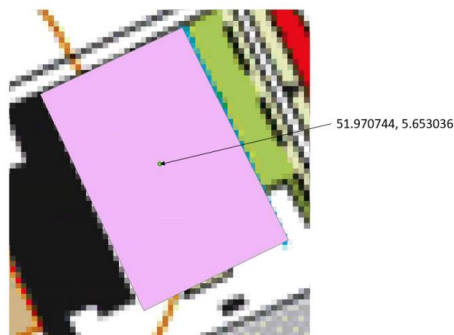


Figure 2: A homogeneous field; therefore, the entire field can be sampled.

## Sampling method

- Use a gouge auger to sample to the recommended depth (see figure 3 and the table on page 3).

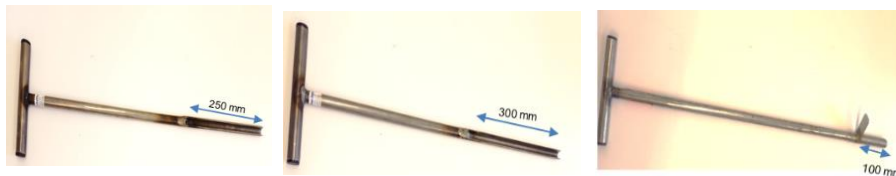


Figure 3: examples of gouge augers

- To avoid sampling compacted ground caused by trampling or heavy traffic, take samples at least five metres from the field borders.
- Do not sample areas with heavy traffic or different usage, such as field entrances, drinking spots, shaded areas, tracks, or former manure storage sites.
- When sampling, walk in a zigzag (W) pattern across the field (see Figure 4a), ensuring at least six sub-samples per leg.

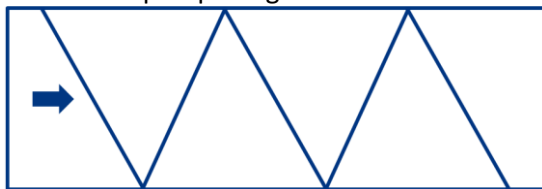


Figure 4a: W-patterns (zigzag) for collecting soil samples

- Before taking a sample, remove as much crop residue or organic material as possible from the soil surface.
- **Tip:** If the field has been recently ploughed, firm down the soil where sub-samples are taken.
- Collect approximately forty sub-samples in total; for peaty soils, collect at least fifty sub-samples.
- Place sub-samples in a clean bucket as they are collected.
- Once all sub-samples have been collected, mix them thoroughly to form a composite sample.
- Place approximately one litre of the composite sample in a clean, dry sample bag and send it to the laboratory for analysis.
- For irregularly shaped fields or areas, a combination of zigzag and cross patterns (Figure 4b) can be used, ensuring sub-samples are evenly distributed. Divide the forty sub-samples accordingly across the different legs.



Figure 4b: combination of W, zigzag and cross pattern for collecting soil samples in oddly shaped areas

- As soon as you have finished sampling, label the sample bag with:
  - Sampling date
  - Location name
  - Name of sample taker and company
  - Sampling depth
  - Current crop in the field
  - Optional: GPS location coordinates (WGS84)

### After sampling

- Keep the sample bags clean and dry.
  - Close the bag to prevent contamination and water loss.
  - Keep out of direct sunlight.
  - Store samples in a cool place (preferably in a refrigerator) to prevent changes in composition.
  - Ensure the bag is labelled correctly.
- Send the samples to the lab as soon as possible, with the correct paper or digital order information.

## Product specifications

Table 1: Sampling method specifications per product

Product	Sampling depth	Sampling area	Additional comments
Soil Carbon Check	Preference: 0-30 cm Other depths are possible	1-2 ha, max. 5 ha	Sampling area depends on heterogeneity. For improved year-on-year comparison, take the sample at the same sampling depth in the same period every year.
Soil Life Monitor	Pastures: 0-10 cm Arable land: 0-25 cm	Max. 2 ha	Collect a representative sample from the field. To establish a reliable baseline for monitoring it is advisable to take a sample during winter in temperate regions. At this time, soil life tends to be more stable owing to lower and less variable temperatures.
Fertiliser Manager Soil Health Indicator	Pastures: 0-10 cm Arable land: 0-25 cm Sports fields: 0-10 cm Orchards: 0-23 cm Vegetables: 0-25 cm Natural areas: 0-30 cm Forestry and plantations: 0-30 cm Perennial systems: 0-30 cm Urban and industrial areas: 0-30 cm	Complete field, Max. 5 ha	<u>Pasture and arable land</u> : always sample the complete field. <u>Sports field</u> : sample after the sports season. <u>Forestry and plantations</u> : Identify representative sampling sites considering tree species, age, and stand density. <u>Urban areas</u> : Select representative locations that reflect typical soil conditions for the intended land use.

### Note

The protocol described above is generally applicable. Variations—such as point sampling or dividing the field into sections and sampling each—are always possible. It is essential to ensure:

- The sample is representative of the location
- The sampling date and depth are recorded

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