

Soil sampling protocol

Testing for Life

Fertilization 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 = 10000 m ² ; 1 feddan = 0.42 ha; 1 acre = 0.4 ha

When to sample

- The optimal time for sampling is when plant growth is dormant (e.g., in grasslands) or when no crops are present, except for green manures. In natural areas, forestry, plantations, and perennial cropping systems, sampling can be conducted year-round. 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, take samples under similar conditions (weather and timing).
- Avoid sampling immediately after field operations such as tilling, liming, fertilization, 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

- Know the location and its heterogeneity
- Make sure that you can take a representative sample and that you can eventually re-sample the same location 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 middle 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 middle point of the sampled area to ensure consistency in future sampling efforts.

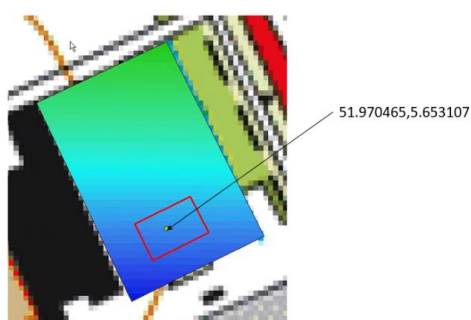


Figure 1: A heterogeneous field; therefore, sample a smaller area within the field.

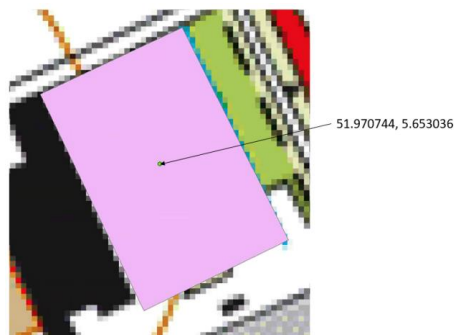


Figure 2: A homogeneous field; therefore, the entire field can be sampled.

Sampling method

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

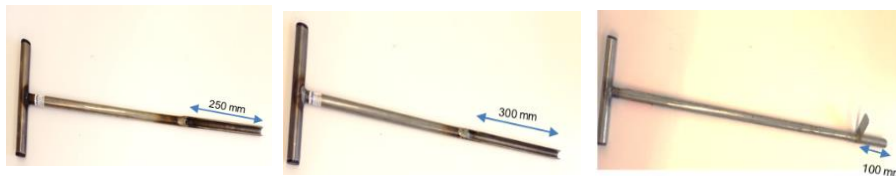


Figure 3: examples of gouge augers

- To prevent sampling compacted ground due to trampling or heavy traffic, sample at least 5 meters from the field borders.
- Avoid sampling areas of heavy traffic or different use, such as field entrances, drinking spots, shaded areas, trails, or old manure storage locations.
- When sampling, walk in a zigzag (W) pattern across the field (see Figure 4a), ensuring at least six sub-samples per leg.

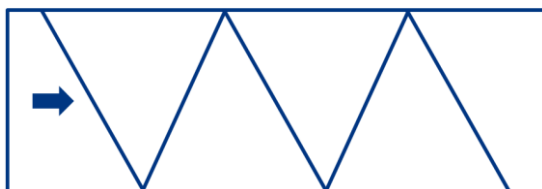


Figure 4a: W-patterns (zigzag) for collecting soil samples

- Before taking the sample, remove as much crop residue or organic material as possible from the soil surface.
- Tip: If the field has been recently ploughed, stamp down the soil where sub-samples are taken.
- Collect about 40 sub-samples in total; for peaty soils, collect at least 50 sub-samples.
- Place sub-samples in a clean bucket as they are collected.
- Once all sub-samples are collected, mix them thoroughly to form a composite sample.
- Place approximately 1 Liter of the composite sample in a clean, dry sample bag and send it to the lab 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 40 sub-samples accordingly across the different legs.

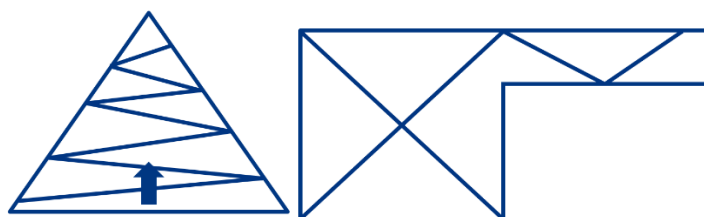


Figure 4b: combination of W, zigzag and cross pattern for collecting soil samples in oddly shaped areas

- 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 a better yearly 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	Sample a representative area of the field. For establishing a reliable baseline for monitoring purposes, it is recommended that a sample is taken during winter in temperate climates. During this time, soil life is more stable due to lower and less variable temperatures.
Fertilization 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 above-described protocol is a general applicable protocol. Deviations (for instance, point sampling or splitting the fields into areas which are all sampled) are always possible. Important to ensure:

- Sample is representative of the location
- Sampling date and sampling depth are recorded

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