

SOIL TESTING GUIDANCE



August 2023

OVERVIEW

During first year certification cycle and certainly before the initial audit, each producer (individual or member of a group) must conduct a number of soil lab tests and macroscopic soil tests.

Soil lab tests are mandatory while macroscopic tests are optional. For soil lab tests, the mandatory indicators are pH, electrical conductivity, and soil organic matter.

For the first year, tests can be accepted up to 3 months before the application as long as they are representative according to the Standard. After initial certification, these tests should be performed every two years. The purpose of the tests is to evaluate the effectiveness of selected regenerative practices and the results are not affecting the certification's decision.

- ✓ Record the GPS coordinates of the sampling sites
- ✓ Keep an electronic record of the results. Operators keep compliance records for at least 10 years.
- ✓ These tests can be performed directly on the farm without special equipment by the farmer and/or an expert.
- ✓ It is suggested, recording / videotaping during the macroscopic soil tests and incorporating the coordinates of the sampling sites.

Number and Methodology of Soil lab test

Depending on the number of plots, a representative number of samples is selected for tests according to the following formula:

Soil lab tests samples per operator = $\frac{\sqrt{\text{total number of operator's plot}}}{2}$, minimum one (1) sample.

In the case of one sample, the sample is taken from the most representative area.

In the case of two samples, the samples are taken from the best and the worst.

In the case of three and more samples, the samples are taken from the best, the worst and the representatives plots.

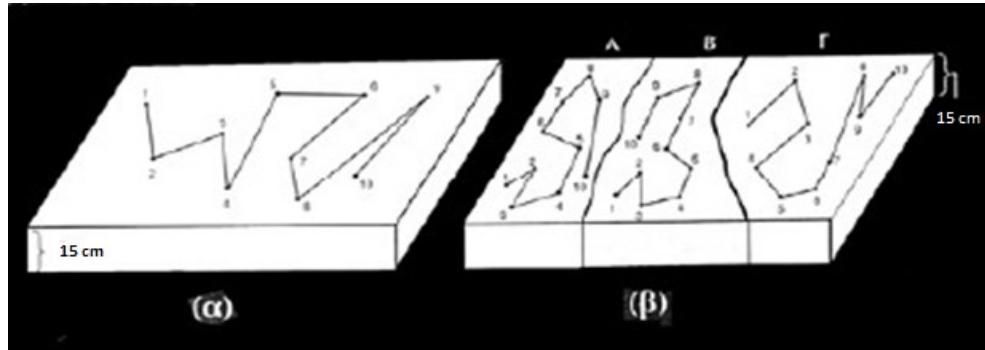
1. Soil Sampling

The sample must be representative of the plot from which it was taken. In order to obtain a representative soil sampling, the sampler must comply with the following:

We observe the field to see if the ground is even or not. This is done by observing whether there are obvious differences in the ground at least by criteria visible to the eye, eg. color, vegetation, relief, slope, rocks.

In case the field is uniform, collect the samples according to figure (α). In case the field is not uniform, collect the samples according to figure (β).

Figure: Sampling points for obtaining a representative soil sample



- We divide the field into uniform sections of soil for each sample. Each section must not exceed 20 acres (8 ha). A sample area of 10 acres (4 ha) or less is preferable.
- We collect the samples in random order as shown in the figure.
- In the mixed sample, a sample should be taken from 10 points, as shown in the figure above.
- Dig to a consistent depth (15cm/6in) and collect soil at each subsample location.
- We do not mix samples from different plots or from different depths.
- After collecting the samples, mix the sample very well to make it homogeneous.
- The final sample weighing 500-600 g (dry) or 1 kg (liquid) is packed in a clean plastic bag and is labelled showing the producer's name, date and time of sampling, sample location (coordinates)
- It is recommended to video the sampling process and integrate the location coordinates (GPS) using a smartphone.
- Repeat sampling, in subsequent years, is always done from the same location.
- Samples must be taken from fields or parts of fields that are homogeneous.
- In all cases, sampling should not be done after any liming or addition of organic substances or fertilization, mainly with phosphate or potash fertilizers.
- During sampling, the soil should be easily rubbed so that the individual samples can be mixed with relative ease.
- As much as possible, keep samples out of direct heat and sunlight.
- Mail samples to the lab as soon as possible after collection and use rapid delivery where available.

2. Macroscopic soil health testing

Macroscopic tests can be performed right on your farm without special equipment by an experienced agronomist.

Test	Control Indicator
Soil compaction	How easily the soil is permeable
Crusting	The surface condition of the soil
Ground cover	Percentage of cover in plants, plant residues or mulch
Ponding	How easily water penetrates the soil after rain, irrigation, etc
Root growth	Visual observation of roots
Aggregation	How easily the soil crumbles
Soil color	The color of the soil

1. Soil compaction

Using a probe, without much force, we try to put it into the ground using only one hand.

Interpret the results as follows:	
Low	If you can push the probe less than 8 cm
Medium	If you can push the probe in but not further than 20 cm
High	If you can push the probe deeper than 20 cm

2. Crusting

This particular test is visual and all that is needed is the experience of the agronomist. The ideal time to do this test is immediately after rain (without it being required). The tester walks the site looking for crusted areas. They are usually places where there is no proper growth of vegetation.

Interpret the results as follows:	
Low	There's lots of surface crusting in the area
Medium	Some areas, but not many, where there's surface crusting amount covering above 5% of the area
High	No areas where there's surface crusting or there's a very small amount covering less than 5% of the area

3. Ground cover

Interpret the results as follows:	
Low	Less than 35%
Medium	35% - 50 %
High	Above 50%

4. Ponding

A visual test that is ideally done within 24 hours after rain, or very early in the morning. The purpose of the test is to observe ponds.

Interpret the results as follows:

Low	Lots of standing water in many places across the field 24 hours after it rains
Medium	Standing water in a few places across the field 24 hours after it rains
High	No standing water in the field 24 hours after it rains

5. Root growth

By digging a hole and looking at crop roots

Interpret the results as follows:

Low	Roots are lacking (not many of them), seem restricted and not well branched.
Medium	Roots are somewhat restricted and there are some fine roots
High	Roots are abundant, branched, and unrestricted

6. Aggregation

It is an indicator of soil structure and its resistance to heavy rains and irrigation. The test is as follows: We find an aggregate from the surface of the soil and place it in a glass of water. After 5 minutes we observe the water and the aggregate.

Interpret the results as follows:

Low	Water is very cloudy, and the soil clump has mostly broken into parts
Medium	Water is somewhat cloudy but the soil clump remains almost intact
High	Water is clear and the soil clump remains intact.

7. Soil color

Pull some soil out of a hole you have dug and check if the soil has a gray color or reddish spots.

Interpret the results as follows:

Low	Light brown color with spots
Medium	Brown color with a few spots
High	Dark brown color