

Soil Life Monitor  
Soil  
plfa

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Example report  
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|                 |                                            |                              |                            |
|-----------------|--------------------------------------------|------------------------------|----------------------------|
| <b>Analysis</b> | Investigation/ordernr:<br>700578/003709655 | Date sampling:<br>07-02-2024 | Date report:<br>19-02-2024 |
|-----------------|--------------------------------------------|------------------------------|----------------------------|

| Results                | Unit       | Result | low | rather low | average | rather high | high |
|------------------------|------------|--------|-----|------------|---------|-------------|------|
| <b>Biological</b>      |            |        |     |            |         |             |      |
| Microbial biomass      | mg PLFA/kg | 8      |     |            |         |             |      |
| Total bacteria         | mg PLFA/kg | 6      |     |            |         |             |      |
| Gram positive          | mg PLFA/kg | 2,9    |     |            |         |             |      |
| Actinomycetes          | mg PLFA/kg | 0,6    |     |            |         |             |      |
| Gram negative          | mg PLFA/kg | 3,6    |     |            |         |             |      |
| Total fungi            | mg PLFA/kg | 0,7    |     |            |         |             |      |
| Arbuscular Mycorrhiza  | mg PLFA/kg | 0,3    |     |            |         |             |      |
| Other fungi            | mg PLFA/kg | 0,4    |     |            |         |             |      |
| Protozoa               | mg PLFA/kg | 0,11   |     |            |         |             |      |
| Shannon Wiener Index   |            | 1,27   |     |            |         |             |      |
| Fungal/bacterial ratio |            | 0,7    |     |            |         |             |      |
| Gram(+)/Gram(-) ratio  |            | 0,8    |     |            |         |             |      |
| <b>Physical</b>        |            |        |     |            |         |             |      |
| Acidity (pH)           |            | 4,8    |     |            |         |             |      |
| C-organic              | %          | 2,63   |     |            |         |             |      |
| Organic matter         | %          | 4,6    |     |            |         |             |      |
| SOC/SOM ratio          |            | 0,57   |     |            |         |             |      |
| Clay (<2 µm)           | %          | 2      |     |            |         |             |      |

**Organic matter** Figure: Quality of the organic matter



**Organic carbon held in micro-organisms**

|                   | mg C/kg |
|-------------------|---------|
| Microbial biomass | 169     |
| Bacterial biomass | 61      |
| Fungal biomass    | 43      |

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**Explanation**

The biological parameters are based on the phospholipid fatty acids (PLFAs) that are present. PLFAs occur in the cell walls of living organisms. Different functional groups have a unique composition of PLFAs. By measuring the composition of the PLFAs, a fingerprint of the microbial community can be given. The target values are corrected based on the organic matter percentage.

**Total microbial biomass**

The sum of all PLFAs is an indication of the amount of microbes. Because PLFAs are rapidly degraded after an organism dies, it mainly represents the living microbial biomass. The microbial biomass is an indicator of the general disease suppression. The more microorganisms there are, the more competition there is with pathogens for space and food. The microbial biomass can be increased by adding effective organic matter such as compost, solid manure, green manures or cultivating grains (incl. straw). Other examples of measures are reduced soil tillage, permanently covering the soil, temporary grassland or less ploughing up of permanent grassland.

**Total bacteria**

Certain groups of bacteria break down (simple) organic material, fix nutrients, bind atmospheric nitrogen, convert ammonium into nitrate nitrogen, form stable aggregates, increase disease resistance and form breakdown products that can weaken or kill pathogens. Bacteria are stimulated by easily degradable materials with a low C/N ratio such as slurry.

**Actinomycetes**

Actinomycetes are a group of Gram positive bacteria that form threads that resemble fungal hyphae and are able to break down complex materials. Actinomycetes are important for disease resistance, because some species can excrete antibiotics or parasitize pathogens. They can also compete with pathogenic fungi for space and food. Actinomycetes prefer airy conditions and develop poorly in compacted soil or acid conditions (pH <5).

**Total and other fungi**

Fungi cause degradation of complex forms of organic material, form stable aggregates, excrete organic acids which improve the availability of some nutrients and increase disease resistance through competition or predation. Fungi are stimulated by recalcitrant materials with a high C/N ratio such as straw and compost.

**Arbuscular Mycorrhiza**

The PLFA-analysis gives insight in the biomass of the active mycelium (network of hyphae) of arbuscular mycorrhiza in the soil. These fungi live in symbiosis with plant roots and thereby increase the root surface. In exchange for sugars, the plant receives water and nutrients such as phosphorus and potassium. In addition, mycorrhizas play a role in disease suppression. Crops that are not able to form a symbiosis with arb. mycorrhiza are crucifers (e.g. cabbage and yellow mustard) and the goosefoot family (e.g. spinach and beet). A high available phosphate content will reduce the development of mycorrhizas.

**Protozoa**

Protozoa are single-cell micro-organisms that contain a cell nucleus (eukaryotes). The most important function of protozoa is to make nutrients available to the plant by "grazing" on microorganisms (mainly bacteria). The activity of protozoa is highly dependent on the presence of moisture in the soil. The radius of action of protozoa is limited to water films and water-filled pores.

**Gram(+)/Gram(-) ratio**

Grams(+) bacteria are generally larger than Gram(-) bacteria and can form spores. This makes them more resistant to drought and water stress. Gram(+) dominant populations (>1) are more common at the start of the growing season and typically move to a more balanced community when the soil conditions become more favorable throughout the growing season. Gram(-) dominant populations (<1) are often associated with other forms of stress such as plowing and pesticide use. Gram(-) bacteria can better tolerate these forms of disturbance due to the presence of an outer membrane.

**Quality of the organic matter**

Organic matter mainly consists of C, N, P and S. Dynamic organic matter contains relatively many N and S, and is easily broken down by microbes. Hereby, nutrients are mineralized that become available for the crop. Stable organic matter contains a relatively large amount of C, and is broken down less fast by microbes. Stable organic matter contributes, among other things, to the processability and looseness of the soil. The quality of the organic matter can be (gradually) adjusted by paying attention to the properties of organic materials (degradability and C/N ratio) such as animal manure, compost and crop residues.

**Contact & info**

|                        |                                                                                  |
|------------------------|----------------------------------------------------------------------------------|
| Soil layer:            | 0 - 20 cm                                                                        |
| Sample was taken by:   | Eurofins Agro, Monsternemer                                                      |
| Contact sample taking: | Klantenservice Agro: 0888761010                                                  |
| Sampling method:       | W-pattern, at least 40 sub samples, according to Eurofins Agro standard MIN 1000 |

If the following information is shown in the reports, this information may have been provided by the client and may affect the valuation, advice and/or analysis result:  
sampling depth, soil type, crop.

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|                                                                     |                |   |          |
|---------------------------------------------------------------------|----------------|---|----------|
| Method                                                              | Biological     |   | Em: NIRS |
|                                                                     | Acidity (pH)   |   | Em: NIRS |
|                                                                     | C-organic      | Q | Em: NIRS |
|                                                                     | Organic matter | Q | Em: NIRS |
| Q Method accredited by RvA                                          |                |   |          |
| Em: Method Eurofins Agro, Gw: Equivalent of, Cf: In conformity with |                |   |          |

Results are reported in dry soil.  
The analyses were done at Eurofins Agro, Wageningen (NL).  
The results relate exclusively to the sample taken and received by Eurofins Agro, and to the material processed on 08-02-2024, and therefore to the sample analysed. For a detailed description of the sampling and analysis methods used, visit [www.eurofins-agro.com](http://www.eurofins-agro.com)

EXAMPLE



MP Voogt