

SUSFORAGE Meeting
10th of March 2022

Soil diversity services

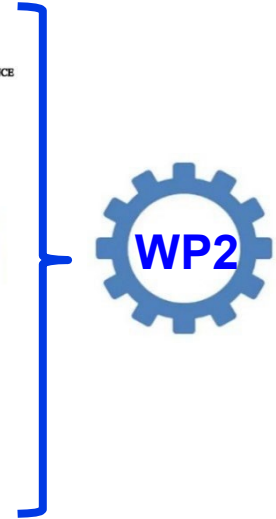
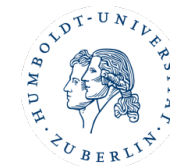


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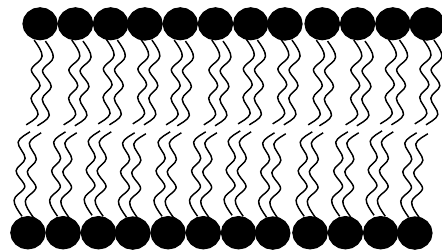
Soil diversity plfa and nematodes services

- **Soil microbial functional diversity:**
respiration, enzymatic capabilities
- **Soil microbial taxonomic diversity:**
microorganisms (metagenomics)
- **Soil microbial structural diversity:**
PLFAs, microbial biomass
- **Soil nematode diversity:**
nematode fauna analyses => **soil health**



One composite sample per plot!

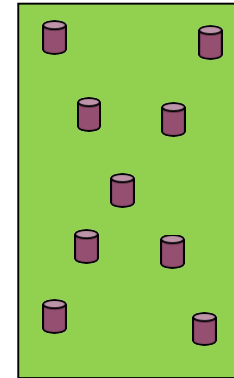
Phospholipid fatty acids in microbial membranes are group specific



Fatty acid	Biomarker for
Methyl-branched (iso, anteiso)	Gram-positive bacteria
Cyclic forms (cy)	Gram-negative bacteria
16:1ω5 (Hexadecenoic acid)	Glomeromycota (arbuscular mycorrhiza)
16:2ω6,9 & 16:3ω3,6,9 (Hexadienoic & trienoic acid)	Green algae (photoautotrophic eukaryotes)
18:3ω3 (Linolenic acid)	Plants
18:2ω6,9 (Linoleic acid)	Fungi (saprobionts, ectomycorrhiza)



1. Soil sampling according to the general protocol for WP2!!!
2. Sieve soil (2 mm) and remove stones and plant debris
3. Per plot 8-10 g fresh weight soil
4. Use labelled, sealed plastic bags & cooling bags
5. Freeze the same day at -20 °C



Sampling Design (as for microbial functional diversity)

- **27** plots x **5** sites x **2** grazing treatments x **2** times
- peak biomass periods in **2022** and **2023**

Sample shipment - **PLFA**



1. Store samples in a freezer at -18 to -20 °C
2. Ship frozen at -18 °C with overnight delivery
3. **Contact us in advance** - we need about 2 weeks to get the “Letter of Authority” to import the soil to Germany
4. Contact Address: **Martin Ewald** (PhD student in the project)
martin.ewald@hu-berlin.de

Shipment of soil to Germany

- The “Plant Protection Office” at Berlin has inspected our labs
- We achieved the status “**closed lab facility**” and are allowed to import plants and soil from outside the EU

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Soil Nematodes services



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Soil health services - *nematodes*



- **Soil microbial functional diversity:**
respiration, enzymatic capabilities



- **Soil microbial taxonomic diversity:**
microorganisms (metagenomics)



- **Soil microbial structural diversity:**
PLFAs, microbial biomass



- **Soil nematode diversity:**
nematode fauna analyses => **soil health**



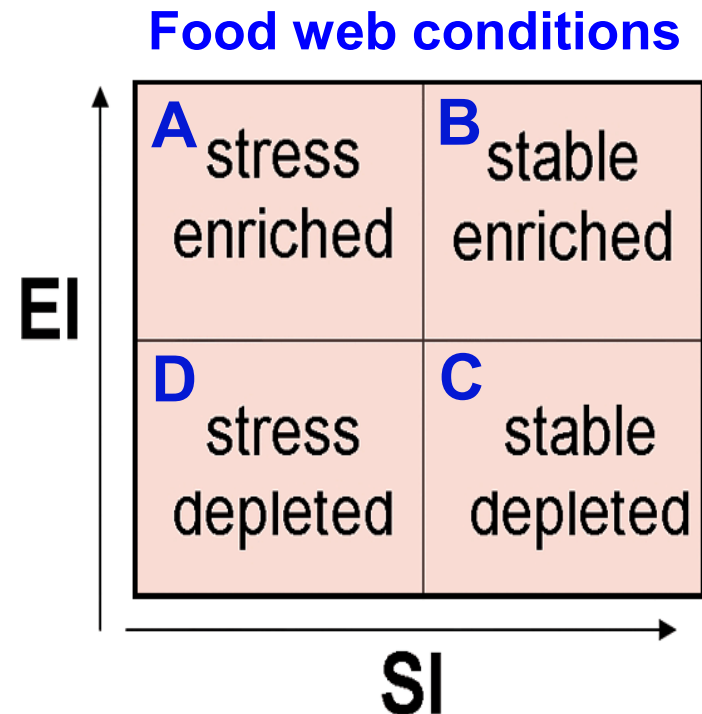
One composite sample per plot!

EI and SI by Ferris et al. (2001)

- bioindication of soil health

General diagnosis

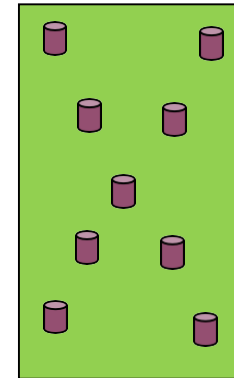
- disturbance
- enrichment
- decomposition channels
- C:N ratio
- food web condition



Sampling and soil handling - nematodes



1. Soil sampling according to the general protocol for WP2!!!
2. **DO NOT SIEVE THE SOIL!**
3. Per plot 80-100 g fresh weight soil
4. Use labelled, sealed plastic bags & a cooling bag
5. **DO NOT FREEZE THE SOIL!** Store at 4-8 °C
(in case sorted longer - open plastic bags shortly)



Sampling Design (as for soil diversity services)

- **27** plots x **5** sites x **2** grazing treatments x **2** times
- peak biomass periods in **2022** and **2023**

Sample shipment - *nematodes*



1. Store samples in a fridge at 4-8 °C, only very short time!
2. Ship cooled at 4-8 °C with overnight delivery
3. **Contact us in advance** - we need about 2 weeks to get the “Letter of Authority” to import the soil to Germany
4. Contact Address: **Martin Ewald** (PhD student in the project)
martin.ewald@hu-berlin.de

Shipment of living animals (nematodes in the soil)

- Please avoid that cooling packs in the parcel have direct contact to the soil samples (wrap with e.g. bubble paper)
- Ship as soon as possible after sampling!