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Soil Physics Laboratory Annual Report 2024

The Soil Physics Laboratory is a routine laboratory providing regular soil physics analyses mainly to support research and environmental monitoring at SLU and external customers.

Highlights

In 2024, the key highlights included:

- A manual of routine analyses protocols in the Soil Physics Laboratory (2000-2020) was published.
- An official change from using Pipette to Pario, as the recommended analyses for texture, was made.
- A staff visit to Agroscope, Reckenholtz – Zürich took place and the laboratory engineer Anna visited the laboratory in Zürich for three days.
- A revision of the calculations for the majority of the routine analyses was updated.

1. Activities

The Soil Physics Laboratory received many samples at the end of the previous year (2023) and in the beginning of 2024. An increase of the total number of samples that has been received during 2024 compared to the previous two years (2022 and 2023) can be seen in Table 1.

Table 1: Number of samples received for analyses at Soil Physics lab Department of Soil and Environment SLU, 2020-2024.

Analysis	2020	2021	2022	2023	2024
pF	482 cylinders	518 cylinders	455 cylinders	588 cylinders	555 cylinders
Texture (pipette method)	332 samples	300 samples	69 samples	33 samples	38 samples
Sat Hyd Cond	397 cylinders	428 cylinder	345 cylinders	252 cylinders	260 cylinders
Water content or Dry bulk density	227 cylinders	84 cylinders	41 cylinders	18 cylinders	205 cylinders
EC + pH		5 samples			14 samples
Wilting point	40 samples	163 samples	29 samples	18 samples	77 samples
Loss on ignition	54 samples	84 samples	8 samples	11 samples	72 samples
Particle density	26 samples	170 samples	43 samples	28 samples	70 samples
Texture (laser)*	215 samples	140 samples	25 samples	249 samples	57 samples
Gravimetric water content	15 samples	15 samples		8 samples	24 samples
Texture in water samples or dust (laser)*		1 sample			89 samples
Texture (PARIO)	84 samples		4 samples	43 samples	355 samples

2. Maintenance

The room dedicated to Pario analyses was rearranged for easier and more ergonomic work with the cylinders and the Pario devices. One of the four working sandboxes for pF measurement had to be taken out of service due to leakages. Further discussions on replacing the old sandboxes with two new boxes are to be continued in 2025. A move of the "Loss on ignition" oven from the main lab to the common oven room in the lab corridor was made due to a discovered problem with fire hazard. Other maintenance included annual maintenance of all scales, cleaning of the centrifuge and emptying of the soil traps under the sinks.

3. Staff (inc. health and safety, training)

The laboratory is served by one fulltime technician, Anna Eklöv Pettersson. Occasionally interns and students uses the facilities with case-by-case arrangements.

In September, Anna visited Agroscope, Zürich for three days to learn more about the lab, exchanging knowledge and comparing protocols with the technician and other staff members working with and in that laboratory.

Anna also took part in some of the practical exercises in the course Markvetenskap earlier in the year as well as accompanied field work for soil sampling at Lanna research station.

4. Communication, publication

- Messing, I., A.M. Mingot Soriano, D. Nimblad Svensson and J. Barron. 2024. Variability and compatibility in determining soil particle size distribution by sieving, sedimentation and laser diffraction methods. Soil & Tillage Research 238:105987 https://doi.org/10.1016/j.still.2023.105987

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