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Soil physics laboratory annual report 2022

Highlights

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. In 2022, the key highlights included

- Participation in a European comparison study of 14 soil physics laboratories in the SOPHIE network, due for publication 2023.
- Publication of Nilsson Nimblad et al (STILL 2022) study of 44 soils to develop the texture analys protocol of pipette and laser diffraction methodology
- Two new Eijkelkamp sandboxes were installed and major cleaning of freezer and cold room spaces.

For 2023, the quality assurance studies of soil texture analyses undertaken in 2021 and 2022, will be submitted.

1. Activities

The Soil Physics lab continued to operate in similar levels at previous years, see summary of completed analyse per calendar year 2017-2022 in Table 1.

Table 1: Completed analyses of Soil Physics lab Department of Soil and Environment SLU , 2017-2022.

Analysis	2017	2018	2019	2020	2021	2022
pF	850 cylinders	725 cylinders	493 cylinders	482 cylinders	518 cylinders	455 cylinders
Texture (pipette method)	577 samples	730 samples	631 samples	332 samples	300 samples	69 samples
Sat Hyd Cond	565 cylinders	463 cylinders	304 cylinders	397 cylinders	428 cylinder	345 cylinders
Water content or Dry bulk density	141 cylinders	549 cylinders	57 cylinders	227 cylinders	84 cylinders	41 cylinders
EC + pH	138 samples	111 samples	14 samples		5 samples	
Wilting point	99 samples	84 samples	57 samples	40 samples	163 samples	29 samples
Loss on ignition	129 samples	39 samples		54 samples	84 samples	8 samples
Particle density	73 samples	30 samples	18 samples	26 samples	170 samples	43 samples
Texture (laser)	69 samples	44 samples	14 samples	215 samples	140 samples	25 samples
Gravimetric water content	120 samples	120 samples	2 samples	15 samples	15 samples	
Texture in water samples or dust (laser)	12 samples		81 samples		1 sample	
Texture (PARIO)				84 samples		4 samples

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The 13th of June there was the open meeting with researchers from the department to present work of the Soil physics lab and discuss future priorities. We discussed the future of the laboratory, which analyses are important and possible new analyses to add at the laboratory.

Ana attended virtually to the annual SOPHIE meeting that was taking place in Paris (January 21-22):

In October, Attila Nemes (NIBIO) visited the lab, and a joint comparative protocol study was discussed with cross check of soil texture using PARIO. To be developed in 2023.

2. New equipment and maintenance

Two new sandboxes from Eijkelkamp were purchased and installed. The pipette equipment used for soil texture analys was cleared, as part of transition to soil texture analys with PARIO or Laser diffraction methodology. In addition, contributions to common laboratory space such as cleaning freezer and cold rooms were provided. Annual maintenance included all scales (including the one in the research laboratory), service in the dishwasher and cleaning water baths

3. Staff (inc health and safety, training)

The lab was served by one fulltime lab technician, additional temporary support of 30% FTE and overall department lab leadership. Occasional students and interns utilised the facility with case-by-case arrangements.

Lab technician Ana Maria Mignot Soriano visited Agroscope Reckenholz in Zurich, Switzerland. She had a guided tour in some of the facilities with the technician Marlies Sommar and the researcher John Koestel.

4. Communication, publication

Nimblad Svensson, David, Ingmar Messing ***Jennie Barron***. *2022.* An investigation in laser diffraction soil particle size distribution analysis to obtain compatible results with sieve and pipette method. *Soil & Tillage Research* https://doi.org/10.1016/j.still.2022.105450

Benjamin et al. (*forthcoming*). Reproducibility of the Wet Part of the Soil Water Retention Curve: A European Inter-laboratory Comparison. (*submitted to SOIL*)

Website : https://www.slu.se/en/departments/soil-environment/laboratories/the-soil-physics-laboratory2/

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