Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Department of Soil Science
Agricultural Water Management

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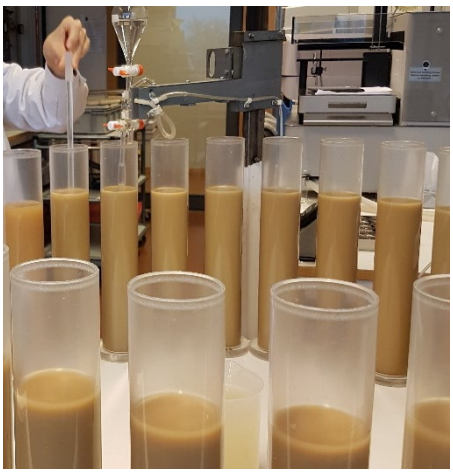
MSc thesis /intern project
Soil Science and Environment; Agricultural Water Management

Texture analysis methodologies and potential impact for soil physical properties

One of the key properties that soils are analysed for is texture, that in turn is used as proxy for many soil physical properties through pedotransfer functions (PTFs). This study will help us work forward in compliance with texture protocols under the EU Soil Monitoring Directive and also inform on how we need to deal with PTF as commonly used to proxy soil physical properties.



In the Soil Physics laboratory we work with various methodologies for texture analyses, the traditional 'pipettte ' method (recommended by the EU Soil Directive to monitor soil health) ; the PARIO devices, and the so-called Laser Diffraction Methodology (LDM), using particle size determination with reflectance scattering). Initial work comparing these methodologies for Swedish agricultural soils show discrepancies (e.g. Nilsson Nimblad et al 2022 ; Messing et al 2024).

This project seeks to understand: can LDM replace the traditional (and ISO standard) of pipette/ PARIO methodology for soil particle determination? And how sensitive are PTFs for soil texture classification input in Swedish agricultural soils?

The thesis will explore a new data set of 100-140 soils, that will be measured with PARIO for soil texture classification. The task of the student/inter will be to run analyses with LDM, and analyse paired results of soil analysis methods. The dataset developed should also evaluate implications on PTF(s) for soil physical properties commonly used for Swedish /Nordic/European context for example see Szabo et al 2021.

The study will take place in the Department Soil Physics Lab, with practical supervision of the Lab engineer Anna Eklöv Petterson for running the LDM analyses. The soil samples are available, and will be analysed by the Lab Engineer for texture with the PARIO in Nov 2025 -Jan 2026.

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