

Overview theses

Soil Physics (Status July 2023)

The Soil Physics Division is concerned with soil properties and processes and their effects on soil functions.

We use laboratory and field experiments as well as numerical models to understand the behavior of soils and plants. In addition to the physically oriented topics, we also cover many other general soil science topics. Below you will find topics for theses that we currently offer.

All theses can be edited and written in German as well as in English. Your own suggestions are welcome.



Topic	Level	Data handling	Literature	Experimental	Contact
<u>Soil-plant-water relationships</u>					
Determination of in-situ plant available water in Forests	B.Sc/ M.Sc.	++ (R/MATLAB recommended)	++	- *BoWa-Klim	Hayat
Improving tree water uptake and transpiration modeling by sap flow measurements	M.Sc.	++ (R/MATLAB recommended)	+	+++	Hayat
Dendrometers as a tool to understand the tree water status	M.Sc.	++ (R/MATLAB recommended)	+	+++	Maier
Understanding the soil-plant water relations of apple tree	M.Sc.	+ (R/excel possible)	+	+++	Hayat
Impact of soil drying on physiological characteristics of young trees	B.Sc/ M.Sc.	+ (excel possible)	+	+++	Hayat
Understanding the water relations between soil and plant in apple trees	B.Sc/ M.Sc.	++ (R/SAS recommended)	+	+++	Maier
<u>Soil Gases</u>					
Soils as Methane Sinks	M.Sc.	+++ (R/SAS necessary)	*	- *SAMS	Maier
Does soil megafauna affect soil CO ₂ and CH ₄ fluxes?	B.Sc/ M.Sc.	+ (excel possible)	+	+++	Maier
Analysis of climatic and site-specific temporal drivers of CO ₂ and O ₂ fluxes in long term data sets	M.Sc.	+++ (R/SAS necessary)	*	- *SAMS	Maier
Development of a low cost chamber system to measure soil CO ₂ and O ₂ fluxes	B.Sc/ M.Sc.	+ (excel possible)	+	+++	Maier
Determination of subsoil respiration using CO ₂ and Radon measurements	B.Sc/ M.Sc.	++ (R/SAS recommended)	++	++	Maier
<u>Nutrients and C Turnover & General Soil Science</u>					
Investigations of selected soils with field soil science & laboratory methods	B.Sc	+	+	+++	Maier/ Gernandt
Investigation of soil carbon turnover by C3 /C4 - plant alternation using $\delta^{12/13}\text{C}$ analyses.	B.Sc/ M.Sc.	+	+	+++	Maier

Material flows in wastewater treatment plants and their significance in an ideal circular economy-(already assigned)	B.Sc.	-	+++	-	Maier
Results from a long-term nutrient deprivation experiment.: (already assigned)	B.Sc.	+	+	+++	Maier
Importance of consulting for humus-building measures for climate protection-(already assigned)	M.Sc.	+	++	++	Maier
Investigation of microbial parameters in arable soils under deep heat influence.	B.Sc.	+	+	+	Gernandt
<i>Sustainable synergies: The importance of biogas plants in organic farming for residue utilization.</i>	M.Sc.	+	+	+	Gernandt
<i>Soil characterization of an agriculturally used Phaeozem site in southern Lower Saxony.</i>	B.Sc.	+	+	+	Gernandt
Agricultural production loss in southern Lower Saxony	M.Sc.	+	++	+	Gernandt
Soil development and land use of volcanic sites	B.Sc.	+	+	+	Gernandt

References for current projects

- *SAMS: <https://www.fva-bw.de/top-meta-navigation/fachabteilungen/boden-umwelt/boden-und-klimaschutz/soils-as-methane-sinks>
- *WWT: <https://www.waldklimafonds.de/index.php?id=13913&fkz=2220WK83A4>
- WindWaldMethan: <https://www.uni-goettingen.de/de/671836.html>
- *BOWA-KLIM: <https://www.waldklimafonds.de/foerderung/projektdatenbank/projektdatenbank-details?fkz=2220WK13X4&cHash=439795247a42eed1a2c898799bfe6ff7>

Contacts

Dr. Faisal Hayat: faisal.hayat@agr.uni-goettingen.de
Prof. Martin Maier: martin.maier@agr.uni-goettingen.de
Dr. Peter Gernandt: peter.gernandt@agr.uni-goettingen.de