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BOOK OF ABSTRACTS

Exploring Soil Organic Carbon Persistence for Sustainable Land Management Practices: A Thermal Analysis Approach

Johanna Maria Zenner[1]*, Jeroen H.T. Zethof[1], Tatiana F. Rittl[2], Klaus Schützenmeister[1], Hermann F. Jungkunst[1]

[1] *iES - Institute of Environmental Sciences, RPTU Kaiserslautern-Landau, Landau, Germany*

[2] *Norwegian Center for Organic Agriculture (NORSØK), Tingvoll, Norway*

** Presenting author: johanna.zenner@rptu.de*

Understanding the persistence of soil organic carbon (SOC) is pivotal for developing effective strategies in climate change mitigation and sustainable land management. Relatively cheap and easy to use methods are needed to study the underlying processes on a larger scale. However, the intricate nature of soil organic matter (SOM) and environmental factors poses significant challenges to accurately assess SOC persistence. This study proposes an integrated approach combining standardized thermal analysis methods with density fractionation to quantify SOC persistence. By comparing techniques such as Thermogravimetric Analysis coupled with Differential Scanning Calorimetry and a multiphase carbon and moisture determinator with a ramped heating analysis, we aim to elucidate distinct patterns in SOC stability across diverse soil compositions and environmental conditions. To do so, we will establish a standardized thermal method for determining SOC persistence in the different density fractions (fPOM, oPOM & MAOM). We will expect that the integration of standardized thermal analysis methods with density fractionation for assessing SOC persistence will reveal distinct patterns in SOC stability across different soil compositions and environmental conditions.

Our research seeks to contribute to the advancement of understanding SOM dynamics in the large scale, essential for devising sustainable land management practices and addressing pressing global challenges related to soil carbon storage and climate change mitigation.

Keywords: soil organic carbon, soil carbon stability, climate change mitigation