Relative Contribution of Roots and Plant Residue to Aggregation and Soil Organic Matter Dynamics. (S03-denef112351-Poster)

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Abstract:

Plant-derived residue, living roots and associated microbial activity play an important role in the process of aggregate formation and stabilization and subsequent protection of SOM. In this study, we investigated the relative contribution of these organic agents to unstable and stable aggregation, aggregate-associated SOM and microbial biomass during a 3 month experiment in which 13C labeled roots and residue from spring wheat plants were used. Two-millimetre sieved soil samples were used from a temperate Mollisol and a weathered Oxisol to investigate how these processes are affected by clay mineralogy. The importance of organic matter as primary binding agent for soil aggregates held true for the temperate Mollisol dominated by 2:1 clay minerals. Oxisols are known for their variable charged minerals forming mineral-mineral bindings, which explains the initial high aggregation independent from residue and root input. Therefore, our hypothesis that aggregates in highly weathered soils are formed more independent from organic matter inputs than in temperate soils, was corroborated.

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