

Master thesis at FiBL, soil science

Title	Soil structure and organic farming - Are organically farmed soils more stable and do they store more carbon than conventionally farmed ones?
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Background	<p>Aggregate stability affects many biological and chemical processes in soils (Fajardo et al., 2016). In particular, its influence on soil water balance, carbon storage (Steffens et al., 2009) and erodibility are of great importance for soil quality and land use (Tisdall and Oades, 1982).</p> <p>Mäder et al. (2002) showed that the aggregate stability in the organically cultivated plots of the FiBL long-term trial DOK is higher than in conventionally cultivated plots. The carbon storage and stabilisation of these soils is currently being investigated within the framework of the SNSF project DynaCarb. First results show differences in the quality and quantity of soil organic matter (SOM) and aggregate stability. In this master thesis these interactions between OBS and aggregation will be investigated in more detail.</p>
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Methods	Determination of the aggregate stability of soils with different amounts and qualities of SOM: 1. wet sieving; 2. ultrasound + particle size analysis; 3. immersion weighing; and 4. image analysis with the soil slaking app.
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Starting date	Just now
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Literature	<p>Fajardo, M., McBratney, A.B., Field, D.J., Minasny, B., 2016. Soil slaking assessment using image recognition. <i>Soil & Tillage Research</i> 163, 119-129.</p> <p>Mäder, P., Fließbach, A., Dubois, D., Gunst, L., Fried, P., Niggli, U., 2002. Soil fertility and biodiversity in organic farming. <i>Science</i> 296, 1694-1697.</p> <p>Steffens, M., Kölbl, A., Kögel-Knabner, I., 2009. Alteration of soil organic matter pools and aggregation in semi-arid steppe topsoils as driven by organic matter input. <i>European Journal of Soil Science</i> 60, 198-212.</p> <p>Tisdall, J.M., Oades, J.M., 1982. Organic-Matter and Water-Stable Aggregates in Soils. <i>Journal of Soil Science</i> 33, 141-163.</p>
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