



The impacts of organic agriculture on soil erosion and flood risk - a qualitative literature analysis

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In Germany, changes in precipitation patterns caused by climate change have increased the risk of soil erosion and flooding. Models show that appropriate land use can lessen the impacts of climate change. It is, for example, often assumed that organic farming has the potential to reduce erosion and surface run-off in comparison with conventional agriculture, due to better soil coverage and improvements in soil structure associated with crop rotations containing a higher proportion of forage legumes and cover crops, and the use of organic fertilisers. As there are, however, relatively few studies that have quantitatively compared organic and conventional farming systems in terms of soil erosion, infiltration and surface run-off, it is unclear if this is actually the case. The aim of this project is therefore to conduct a meta-analysis of data in the scientific literature to quantitatively assess the impacts of organic agriculture on erosion and flood risk in temperate areas. A literature search was conducted in the scientific databases Web of Science and Scopus using various keywords, including erosion, run-off and infiltration. Data pertaining to seven parameters was extracted from 37 studies. As a preliminary qualitative analysis the results for each parameter were summarized to see if the values for the organic treatment were higher or lower in comparison with the conventional treatment. The relative percentage difference between organic and conventional systems was also calculated for each parameter. The results show that soil organic carbon and aggregate stability were higher, and bulk density lower in organic systems. Correspondingly, infiltration was higher and surface run-off lower in the organic treatments. The cover-management (C) factor from the RUSLE was also lower for organic agriculture, indicating lower rates of soil loss. Median soil loss was 29% lower in the organic treatments, however studies reported diverging results depending on the choice of crop rotations and tillage systems in the comparison pairs. Due to the high heterogeneity of the studies further analysis is necessary to assess the comparability of the studies.