

## **Soil quality and soil degradation in agricultural loess soils in Central Europe – impacts of traditional small-scale and modernized large-scale agriculture**

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The study analyzes the impact of different farming systems on soil quality and soil degradation in European loess landscapes. The analyses are based on geo-chemical soil properties, landscape metrics and geomorphological indicators.

The German Middle Saxonian Loess Region represents loess landscapes whose ecological functions were shaped by land consolidation measures resulting in large-scale high-input farming systems.

The Polish Proszowice Plateau is still characterized by a traditional small-scale peasant agriculture.

The research areas were analyzed on different scale levels combining GIS, field, and laboratory methods.

A digital terrain classification was used to identify representative catchment basins for detailed pedological studies which were focused on soil properties that responded to soil management within several years, like pH-value, total carbon (TC), total nitrogen (TN), inorganic carbon (IC), soil organic carbon (TOC=TC-IC), hot-water extractable carbon (HWC), hot-water extractable nitrogen (HWN), total phosphorus, plant-available phosphorus (P), plant-available potassium (K) and the potential cation exchange capacity (CEC).

The study has shown that significant differences in major soil properties can be observed because of different fertilizer inputs and partly because of different cultivation techniques. Also the traditional system increases soil heterogeneity. Contrary to expectations the study has shown that the small-scale peasant farming system resulted in similar mean soil organic carbon and phosphorus contents like the industrialized high-input farming system.

A further study could include investigations of the effects of soil amendments like herbicides and pesticide on soil degradation.