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Investigation and assessment of the impact of grassland farming on long-term soil monitoring sites in the federal state of Schleswig-Holstein (Northern Germany)

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In order to assess changes on soil properties there are ten grassland used long-term soil monitoring sites in Schleswig-Holstein, which were mostly established in 1989/90 as recommended by the German Federal and State Panel for Soil Protection (LABO).

The investigation does operate on topsoils with a long-term data set in low temporal resolution over a period of 20 years. It does focus on the detection and assessment of the impact of grassland farming on soil properties, in particular soil organic matter and soil biological conditions in Schleswig-Holstein.

At the monitoring sites comprehensive chemical, physical, microbiological and soil zoological analyses are carried out in intervals varying between three and ten years. For the datagroups specific measurement uncertainities and site variabilities were calculated to combined and extended uncertainities.

Likewise the investigation operates with detailed cultivation data of conventional and organic grassland farming practices. Based on these data matter entries were calculated, such as nutrients and heavy metals.

The paper mainly focuses on the assessment of how matter entries and farming practices do influence important chemical and biological soil properties and states possible effects on soil organic matter. It demonstrates the reaction of soil organisms and microbiological indicators by changing tillage and different input of fertilisers and distinguishs probable effects on the ecological development of the topsoils.

Referring to these relationships there will be a comparison of the changes of soil properties between single sites and the whole grassland data group. The paper concludes with an assessment of possibilities and limitations of the monitoring programme, recommendations for the further project management and gives an outlook on following steps of the study.