



Impact of climate change and land management of soil organic matter storage in Saxony

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Climate change and soil organic matter dynamics have a close relation to each other. We have investigated what impact the climate change will have for three soils representing typical site conditions in Saxony, Germany. Furthermore it is necessary to know what the options are to mitigate those impacts by means of adaptations of the land use. Initial conditions and soil parameters were given from soil survey data. The 23 different management scenarios for each soil ranged from the continuation of business as usual to land use variants with much higher inputs of organic matter like pasture or intensive application of extern organic matter to variants where all available biomass was taken away from the field for instance to produce bioenergy. Downscaled data for the climate development were used from the WEREX data set. Simulations with the CANDY model produced for each of the generated scenarios the prognosticated time course of the organic carbon content in the top soils from 1991 to 2050.

The results have shown that depending on the management scenario for all site conditions an increase or a loss of organic matter could be possible. Generally we found that an expansion of organic farming in the long run would result in a loss of organic matter even if a possible increase of crop yields has been considered. For conventional farming systems a close relation was found between the change of soil organic matter storage and the offtake of energy from the agricultural system.

The general conclusion of this study was that with only a small adaptation of the

agricultural management the stabilization of the amount of organic matter stored in soil should be possible. Deeper investigations are required to show whether this holds for other site conditions too.