



Soil physical parameters and their heterogeneity on a homogenously established post-mining recultivation site in Eastern Germany

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The largest lignite mining area of Germany is located in Lusatia, Eastern Germany. In this region lignite mining leads to disturbances on a landscape level. Recultivation efforts attempt to regenerate post mining areas for various land use options.

Our study is concerned with the agricultural recultivation of post lignite mining areas in this region. The sandy to loamy substrate that is used for recultivation stems from depths of several meters and is therefore free of soil organic matter. However, some lignite fragments are present. The substrate itself is unstructured.

During the excavation, deposition and management process the substrate is subject to strong mechanical stresses. This practice leads to more or less serious soil compaction causing decreased yields of agricultural crops. In this context we investigate the effect of different organic soil additives in combination with different recultivation crop rotations on the development of soil structure for improved agricultural land use. Our experimental site has recently been heaped up and levelled off.

On each of the 24 experimental sub areas undisturbed soil samples have been taken to characterise the experimental substrates according to their mechanical and hydraulic parameters and to determine the scattering of these parameters on a site that is supposed to be established as homogenously as possible. We present the experimental set-up and first results of the status-quo sampling of the site before any recultivation practice has been applied. The results show that the site is profoundly heterogeneous in terms of mechanical stability, bulk density, total pore volume, saturated hydraulic conductivity, etc.. Moreover the mechanical stability, in this case precompression stress, decreases with increasing bulk density which shows that the assumption that a substrate's mechanical stability increases with increasing bulk density is not necessarily true.