Soil Formation and Developement of Humus Forms in Post-Mining Soils from Point Zero on - Combining Morphological Observations, Element Analysis and 13C CPMAS NMR Spectroscopy. (S05-fettweis063308-Oral)

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Abstract:

In the Lusatian lignite mining district of eastern Germany about 80,000 ha of land have been turned into dumps by open-cast mining during the past 150 years. Most of the overburden material consists of a mixture of Quaternary and carboniferous Tertiary sandy sediments. To a large extend these areas have been afforested with Scots pine or with red oak after amelioration with lignite-derived ash and NPK fertilizer. The pedogenesis, particulary the formation of soil organic matter (SOM) is of importance for forest ecosystem development, especially in sandy substrates where SOM functions as water, nutrient, and energy storage. Therefore, the formation of SOM and the development of specific humus forms as an indicator for site development have been investigated in reclaimed Scots pine and red oak stands as well as in comparable stands on undisturbed sites of the general region. SOM developement was investigated by combining morphological observations, element analysis, and 13C CPMAS NMR spectroscopy. The development of SOM was calculated by differentiation of lignite-derived (geogenic) and recent carbon pools using the 14C AMS technique.

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