

DOKTORSKÝ STUDIJNÍ PROGRAM/ DOCTORAL STUDY PROGRAM

NÁVRH TÉMATU/PROPOSAL OF THEME

Studijní program/*Study Program*: **Special Agricultural Science**

Studijní obor/*Branch of Study*: **Exploitation and Protection of Natural Resources**

Katedra/*Department of*: **Department of Soil Science and Soil Protection**

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Forma studia/*Form of Study*: **prezenční**

Téma/Theme: The influence of various tree species on initial soil forming processes on reclaimed dumpsites

Hypotéza/ Hypothesis : It is possible to identify the tree species with the best influence on newly formed soils, from the point of view of water retention capacity, soil organic matter content and quality, pH, nutrient availability and biological activity.

Anotace/Annotation: Reclamation of Technosols presents a serious issue in a modern industrial society. Technosols created by coal mining, in particular, are very common not only in Central Europe, but world-wide. Reclamation of these sites by afforestation is a common method in everyday practice. Typical examples can be found in Western Bohemia, Czech Republic, where many dumpsites and reclaimed sites have been afforested after brown coal mining. The main goal of this research is determination of different soil forming processes under different vegetation tree species, as well as determination of changes that occur in physical, chemical and biological characteristics of newly developed soil profiles. Special emphasis will be put on the influence of different soil vegetation cover on the amount of carbon stock in the soil, nutrient cycling and availability and water holding capacity of the newly formed soil. Soil samples will be collected under different tree species, and soil physical characteristics will be determined: bulk density, porosity, texture, water retention, water holding capacity, and stability of soil aggregates. At the same time, soil chemical properties will be studied, focusing mainly on pH, organic carbon content and quality, nutrients stock and availability, and possible presence and form of potentially toxic elements, including Al. The influence of soil vegetation cover on soil chemical characteristics via soil exudation will be investigated. Basic soil biological parameters will be determined, too (selected enzyme activities, composition and abundance of micro- and mesoedaphon). The obtained data and new knowledge should be used for the prediction of soil forming processes in anthropogenic soils and for planning of reclamation on new sites.

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Podpis/*Signature*: