

# Effect of Alders (*Alnus Sp.*) on Technosols Development on Lignite Combustion Wastes Disposal<sup>1</sup>

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**Abstract:** Combustion waste and fly ash disposal sites display unfavourable properties for revegetation. Owing to its phytoameliorative ability different alder species have long been used in the reclamation of degraded sites, as N-fixing species and forecrop for introducing more demanding tree species in reforestation. We present the effect of black alder (*Alnus glutinosa*), grey alder (*A. incana*) and green alder (*A. viridis*) planted in 2006 into the lignite combustion waste disposal site in central Poland on the physicochemical and biological properties of the developed technosols. The study plots were randomly arranged (72 m<sup>2</sup> of each plot, four replications for variant) at 3 species × 2 different soil treatment: CCW+L (combustion waste with lignite amendment in planting hole) and CCW (pure combustion waste). The obtained results indicate that soil treatment did not significantly influence the studied physicochemical soil parameters, whereas the effect of species was clearly noted. The highest growth and survival was noted for the black alder. Accumulation of litter layer (Oi) ranged from 2.9 to 3.6 Mg ha<sup>-1</sup> (mega gram per hectare), and grey alder litter was characterized by the highest content of nutrients (N-P-K). Organic C content in the 0-5 cm mineral layer (A) increased from 38.06 to 47.80 g kg<sup>-1</sup> (gram per kilogram dry soil), respectively for green and black alder, whereas the highest N content in A layer was measured under black alder. Microbial respiration and biomass were significantly lower in the Oi layer under the green alder than under two other alder species. However, in the mineral soil all three alder species stimulated microbial biomass and activity similarly. Because of the highest growth parameters of black alder and the highest litter production under canopy and N content in the soil we recommend this species to revegetation of combustion waste disposal site<sup>3</sup>.

Additional Key Words: Fly ash, revegetation, N-fixing, Soil Respiration

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