

PRODUCTIVITY OF BLACK ALDER (*ALNUS GLUTINOSA* (L.) GAERTN.) PLANTATIONS ON RECLAIMED OIL-SHALE MINING DETRITUS AND MINERAL SOILS IN RELATION TO RHIZOSPHERE CONDITIONS

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The present research was carried out in three black alder plantations in Estonia in 1998–2002. The above-ground productivity and the efficiency of nitrogen and phosphorus use in a plantation in reclaimed opencast oil-shale mining area in Sirgala were analyzed and compared with two plantations growing on fertile mineral soils. The activity and diversity of microbial communities in the soil–root interface and in bulk soil were investigated. The above-ground productivity of the plantations was comparable (14.3 to 17.2 t ha⁻¹ yr⁻¹); nitrogen use efficiency (116.5 kg kg⁻¹) was highest in Sirgala. Although initial phosphorus content in oil-shale mining detritus is low, the availability of phosphorus was highest in Sirgala. Alders created a favorable environment for microbes at their soil–root interface in oil-shale mining detritus. A planting density from 2,000 to 2,500 trees per hectare is recommended for establishing plantations of black alder on exhausted oil-shale opencast mines.

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