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The potential use of Mn-mud in a low quality sandy soil on the bases of growth and plant-microbe interaction at four grasses

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The use of Mn-mud, as a potential applicable product of Úrkút Mn-ore was studied in a microcosm experiment. Four grasses (Bromus inermis, Lolium perenne, Festuca rubra and Poa pratensis) were used to study their growth and Mn-(microelement)-uptake from a low quality of sandy soils from Őrbottyán, Hungary. The soil was amended with Mn-sludge (500 mg/kg) from Úrkút, Hungary, before the sowing. Plants were grown for 8 weeks and soil was sampled several times during the growing season. Dry matter production, element uptake and some microbial characteristics (as the colonization of arbuscular mycorrhiza fungi, AMF and the total catabolic enzymatic activity, measured by fluorescent diacetate analysis, FDA) was assessed beside the total ICP element analysis of soils and plants.

There were great differences found among the grasses regarding the measured microbial characteristics. An enhanced mycorrhiza colonization (M%) and activity (A%) assessed as arbusculum richness was found with the Mn-addition, mainly at two grasses, such as the Festuca rubra and Poa pratensis only. We conclude that variability in interaction and plant-microbe respond can provide an appropriate tool for the plant-selection for the potentially Mn-amended soils.

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