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ABSTRACTS

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ABSTRACTS OF THE 4TH WORLD ALFALFA CONGRESS

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- Poster

Mineral composition of alfalfa grown in soils with increased concentrations of trace elements

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Growing plants in soils with increased content of potentially toxic elements requires careful management due to the elements entry into the food chain through crops. In this study, the alfalfa (*Medicago sativa* L.) was grown in the two locations on Fluvisol with different increased nickel (Ni) concentrations: location Mala Ivančica (near Belgrade) with 58 mg kg⁻¹ and location Globoder (near Kruševac) with 195 mg kg⁻¹ of Ni. In addition, the soil near Kruševac has increased concentrations of chromium (Cr) and lead (Pb). Inoculation of alfalfa with different rhizobial strains (*Ensifer meliloti*) was performed. The experiments were established both under the field and greenhouse conditions in spring 2024. In the field conditions inoculation of alfalfa seeds (variety K-28) was performed with the strains of rhizobia, *E. meliloti* 218, 224, G-nov, 4193cs, 217k, 252. Inoculation of alfalfa grown in pots (greenhouse conditions) with additional seven strains of rhizobia (GPD2, 225, Melxx, 10-2BM, L3Si, L4, 4148ss) was done. The dry mass yield and elements concentrations in alfalfa plants (N, As, Co, Cd, Cr, Cu, Fe, Mn, Zn, Ni, Pb) were measured. The plants analysis was done in first cut at the beginning of flowering. It was shown that dry mass yield and Ni concentrations were influenced by the soil characteristics, treatment as well as their interaction. In some inoculated treatments the increase in dry mass yield (up to 20%) and nitrogen content compared to non-treated control plants was observed. The differences between two soil locations were more pronounced under the field conditions than in the greenhouse, where the best performant characteristic showed two treatments *E. meliloti* 252 and 4193cs. Inoculation with some strains decreased Ni concentration (up to 40%) compared to the control, depending on the strain and type of soil. Alfalfa Ni concentrations in shoots varied from 1.73 up to 7.35 mg kg⁻¹, depending on the soil type, the treatment and culture conditions. The significantly higher concentration of Ni, Cr and Pb in plants of all treatments were detected in the soil with their higher concentrations. Generally, more elements were stored in roots than in alfalfa shoots. Concentrations of all tested elements were mainly within the range of common values for plants. Further research is necessary to evaluate the effects on growth in the second and third year of the trial.

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