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BIOACCUMULATION AND TRANSLOCATION OF ARSENIC AND CADMIUM IN SOYBEAN

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Abstract

This study evaluates the capacity of four soybean varieties, Avigea, Balkan, Ilindenka, and Pavlikeni, to uptake Cd and As from soil and translocate them in different plant parts. Soil samples were analyzed for physicochemical properties, total and available element content. In soybean plants, element concentrations were measured in roots, shoots, leaves, seeds, and pods using ICP-MS. The bioconcentration (BCF) and translocation factor (BTF) were calculated to assess the potential of bioaccumulation. Results showed that all varieties accumulated metals mainly in roots and leaves, while seeds and pods contained minimal concentrations. The Avigea variety demonstrated the highest ability to uptake and translocate Cd, particularly in leaves. All varieties exhibited $BCF > 1$ for As in root, shoot, and leaf tissues, indicating their capacity to uptake this element despite its low bioavailability in soil. However, the content of As in the seed remained low and poses no threat to human and animal health.

Key words: soybean, arsenic, bioaccumulation, translocation, ICP-MS.