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EFFECT OF RICE HUSK ON ARSENIC ACCUMULATION IN POTATO PLANT UNDER DIFFERENT LEVELS OF ARSENIC TREATED SOIL

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Abstract

A pot experiment was conducted in the experimental field of Sher-e-Bangla Agricultural University, Dhaka during the period from November, 2020 to May, 2021 to find out the effect of rice husk as a bio-adsorbent to decontaminate As toxicity in potato. The experiment consisted of two factors. Factor A: Arsenic levels (4) viz., As0: control (0 mg As kg⁻¹ soil), As1: 20 mg As kg⁻¹ soil, As2: 40 mg As kg⁻¹ soil, and As3: 60 mg As kg⁻¹ soil. Factor B: Rice husk levels (4) viz., R0: control (0 g kg⁻¹ soil), R1: 20 g kg⁻¹ soil, R2: 40 g kg⁻¹ soil and R3: 60 g kg⁻¹ soil. The experiment was laid out in a factorial randomized complete block design with three replications. Results revealed that As and/or rice husk had significant effect on arsenic load in different plant parts of potato. Arsenic content in potato tuber flesh, peel, haulm and root gradually increased with the increase of its levels. On the contrary, As content in plant parts decreased with increasing rice husk levels. The soil treated with As1R3 exhibited As accumulation in tuber flesh (0.1070 mg kg⁻¹ fresh weight) and peel (0.443 mg kg⁻¹ FW), respectively. As load in different plant parts was in the sequence: root > haulm > tuber peel > tuber flesh. Although, the least As loading in tuber flesh was observed in As1R1, As1R2, As1R3 (range 0.1258-0.1070 mg kg⁻¹ FW) which also showed higher productivity (range 402.67 - 416.67 g plant⁻¹), but the treatment combination of As1R1 may be suitable for safe potato cultivation in lower level As contaminated soil. Therefore, potato growers can grow potato up to 20 mg As kg⁻¹ contaminated soil treated with 20 g rice husk kg⁻¹ soil, which contains safe As load than the critical one (0.157 mg As kg⁻¹ FW) for human consumption. So, application of rice husk for potato cultivation may be a good option to reduce the arsenic hazards in lower arsenic endemic areas.

