SOIL-TO-PLANT TRANSFER FACTORS: LIMITATIONS OF A SIMPLE CONCEPT

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The use of soil-to-plant transfer factors is common practice in radioecology. Their mathematical formulation is based on the fundamental assumption that the concentration of a radionuclide in a plant relates linearly only on the average concentration of the radionuclide in the rooting zone of the soil. However, the large range of transfer factors reported in the literature shows that the concentration of a radionuclide in a soil has only minor impact on its uptake by a plant, whereas other processes not included in the definition of the soil-to-plant transfer factor are of greater importance.

This paper gives a review of processes, which influence root uptake of trace substances by plants. It is concluded that soil-to-plant transfer factors are a valuable tool for radiological screening models which are used for rapid impact assessment after accidents, but due to their simplistic definition do not assist in understanding root uptake processes of radionuclides by plants.