

**TRANSFER OF  $^{226}\text{Ra}$  TO PLANTS FROM TWO TYPES OF SOIL**

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The transfer of  $^{226}\text{Ra}$  to plants used as food (carrot, parsley, wheat) and as fodder (grass, maize) has been studied. Plants were grown on two types of soil: sandy soil (I) and sandy loam soil (II) in an open field (exposure to dry and wet deposition, resuspension and soil adhesion) and in polyethylene tent with an underground irrigation system (isolation from wet deposition and from water splash on soil). The plants were grown simultaneously on the open and sheltered fields.

The average concentration of total  $^{226}\text{Ra}$  in Soil I was equal to  $8.48 \pm 0.50 \text{ Bq kg}^{-1}_{\text{dw}}$  and concentration of exchangeable  $^{226}\text{Ra}$  was  $0.62 \pm 0.07 \text{ Bq kg}^{-1}_{\text{dw}}$ , while in Soil II they were equal to  $12.2 \pm 0.56 \text{ Bq kg}^{-1}_{\text{dw}}$  and  $0.66 \pm 0.05 \text{ Bq kg}^{-1}_{\text{dw}}$ , respectively.  $^{226}\text{Ra}$  was determined in above-ground parts of plants after washing in distilled water, in the rinse obtained from washing, in insoluble residue separated from the rinse, and in roots. The data obtained allowed to determine the incorporated radionuclide into the plants and on their surface. The statistical analysis of data indicates a lack of differences in the incorporated  $^{226}\text{Ra}$  for plants growing on the open field and in the tent. This indicates that  $^{226}\text{Ra}$  enter the plants mainly via root system, whereas incorporation through leaves and stems is negligible. Table 1 gives some results.

Table 1.

Average concentrations of  $^{226}\text{Ra}$  incorporated into plants and washed out from the plants' surface  $\text{mBq kg}^{-1}_{\text{dw}}$

Plant	Soil I		Soil II	
	Incorporated $\text{mBq kg}^{-1}_{\text{dw}}$	Washed out $\text{mBq kg}^{-1}_{\text{dw}}$	Incorporated $\text{mBq kg}^{-1}_{\text{dw}}$	Washed out $\text{mBq kg}^{-1}_{\text{dw}}$
Grass, cut I	536±49.8	29.6±16.6	240±46.4	87.3±69.4
Grass, cut II	635±141	101±55.1	463±20.6	78.5±38.3
Parsley				
root	1044±55.9		1009±110	
leaves & stems	1977±91.4	223±40.1	2559±420	1022±131
Wheat				
straw	918±65.4	87.8±54.0	554±11.8	
grain	96.5±7.97	18.0±3.32	90.7±4.96	

In majority of the cases the concentration of  $^{226}\text{Ra}$  was in the plants growing on Soil I higher than on Soil II although the concentration of total  $^{226}\text{Ra}$  was in Soil I about 1.4 times lower than in Soil II. The concentration of exchangeable  $^{226}\text{Ra}$  was in both soils almost the same. The total external contamination of the plants was at average about 30% of the incorporated  $^{226}\text{Ra}$  and about one third of the external contamination was soluble. Transfer Factors related to exchangeable and total  $^{226}\text{Ra}$  in soil were calculated.



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