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## **$^{137}\text{Cs}$ and $^{90}\text{Sr}$ CONCENTRATIONS IN JORDANIAN SOILS AND PLANTS**

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Whilst some research and publication has been done and published about natural radioactivity in Jordan, only one paper has been published about artificial radioactivity in Jordanian soils\*, which reveals high concentrations of  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  in some regions in the northwest section of Jordan. The sources of contamination were not determined in this paper.

Soil samples were collected from eleven different locations of the northwestern section of Jordan on April 2004. During sampling, the soil was separated into 5cm thick layers. Plants have been collected from eight of these locations. The samples were prepared and submitted for gamma analysis using a HPGe detector of 50% relative efficiency and having resolution of 2.4keV at 1.33MeV. Chemical extraction of  $^{90}\text{Sr}$  has been performed on some samples using the Nitric Acid Method followed by beta analysis using a gas-filled proportional counter with an efficiency of 21.3% cps/Bq. Another set of the samples is under preparation for beta analysis.

Significant values of  $^{137}\text{Cs}$  were found in the soil samples. The surface concentrations of  $^{137}\text{Cs}$  ranges from 2.7 Bq/kg to 28.2 Bq/kg. Depth profiles of  $^{137}\text{Cs}$  show a decrease of activity with increasing soil depth. An exponential fit has been done for all  $^{137}\text{Cs}$  depth profiles and we found that the soil profile was disturbed in two locations. The soil-to-plant transfer coefficients are in the range of 0.055 to 0.382 Bq/kg.

A new set of thinner sliced soil samples has been brought from Jordan in July, 2005 for further studying, to calculate the external dose from  $^{137}\text{Cs}$ , trying to find a suitable model for  $^{137}\text{Cs}$  migration in soil and determining the sources of contamination (Global fallout or Chernobyl).

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- Radioactivity concentrations of  $^{40}\text{K}$ ,  $^{134}\text{Cs}$ ,  $^{137}\text{Cs}$ ,  $^{90}\text{Sr}$ ,  $^{241}\text{Am}$ ,  $^{238}\text{Pu}$  and  $^{239+240}\text{Pu}$  in Jordanian soil samples, I. Al Hamarneh, A. Wreikat, K. Toukan, Journal of Environmental Radioactivity 7 (2003) 53-7.