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Radiological impact of Iraqi phosphate fertilizers on humans and the agricultural environment

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During the last decades, the use of inorganic fertilizers, pesticides and agricultural chemicals has expanded in order to increase agricultural production and improve soil properties. Inorganic fertilizers in particular include the use of phosphate fertilizers that contain varying quantities of natural radioactive materials such as uranium and thorium and their disintegration products that are harmful to humans and animals, As well as heavy metals such as cadmium, chromium and lead. Because of the long-term use of these fertilizers, addition and collection of radioactive materials and heavy metals occurs in the soil, meaning that their concentrations increase over time. The phosphate fertilizer company was produced with extraction of uranium until the destruction. After the destruction of the uranium extraction unit associated with phosphate fertilizer company in 1991 at the Akashat site. Production and export of these fertilizers has stopped. When working in the industrial complex was restarted, new production of fertilizers and other products is provided. The Iraqi radioactive sources regulatory authority has focused on the importance of knowing and determining the impact that the destruction of the uranium extraction unit has had on new production and determining the rates of increasing uranium concentrations in these products and the effect of their expected radioactivity on humans and the environment. In this study, uranium and radium concentrations were measured in the fertilizers produced by the Iraqi General Phosphate Company and the expected radiological impact of long-term use on humans and the agricultural environment was evaluated, where the concentrations of ²²⁶Ra, ²³⁸U, and ⁴⁰K in Iraqi fertilizers are 411 Bq/kg, 517 Bq/kg and 12.2 Bq/kg respectively.

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