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EFFECT OF SEWAGE SLUDGE APPLICATION ON WHEAT CROP PRODUCTIVITY AND HEAVY METAL ACCUMULATION IN SOIL AND WHEAT GRAIN

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Abstract

The present work illustrates the results of a long-term field experiment with sewage sludge used on agricultural land in order to assess the influence of sewage sludge on wheat crop productivity. The experimental research was conducted for three years as following: the evaluation of the agricultural use of sewage sludge in the year of application and its residual effect in grain and in soil for the next two years. The sewage sludge considered in the framework of the study was from Sfântu Gheorghe wastewater treatment plant, Covasna County (non-fermented sewage sludge from the dewatering press), Romania. Through the laboratory work, the heavy metals content in sewage sludge, soil, sewage sludge and soil (mixed sample) and wheat was identified. The attention was mainly focused on heavy metals content of sewage sludge because these kinds of contaminants are currently the most significant factor limiting its reuse in agriculture. In this way, the potential impacts of emerging micro-pollutants as cadmium (Cd) and lead (Pb) existing in sludge have been investigated. The results from our field experiments showed positive results related to sewage sludge spreading on agricultural land. Using chemical fertilizer and different doses of sewage sludge (0, 10, 25 and 40 t/ha), it was observed an improvement in the amount of harvested grain. It was demonstrated that a dose of 25 t/ha sewage sludge application provides highest wheat crop productivity, while Cd and Pb concentration levels in soil and wheat grain were under the maximum values allowed by the regulation.

Key words: human health, productivity, quality, sewage sludge, wheat

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