Research Note

Analysis of Crop Growth and Transfer of Radiocesium in Soils for Farmland Reclamation in litate Village

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 Summary • Radiocesium released by the Fukushima daiichi nuclear power station accident was deposited into the environment, including onto agricultural land. In the area affected by the radiocesium contamination, decontamination efforts, such as removal of the surface soil, have been carried out. The Ministry of the Environment is working on volume reduction and recycling of the removed soil. Recycling has been implemented in Nagadoro borough in Iitate village. A project to use the recycled soil as the base for farmland and cover it with 50 cm of uncontaminated soil from mountain forests and hillsides has been implemented. In this study, therefore, three pot experiments using the recycled and covering soils were conducted in a glass greenhouse in order to (1) understand the characteristics of the covering soil and the recycled soil, and (2) investigate crop (sorghum, amaranth and giant miscanthus) growth and radiocesium transferability in these soils. The results suggested that the covering soil had low fertility so that use of organic matter or additional application of chemical fertilizer is necessary to improve crop growth. The recycled soil appeared to have different characteristics depending on the area where the soil was removed. In addition, it was confirmed that the transfer of radiocesium from recycled soil to crops could be suppressed by increasing the exchangeable potassium content. In a pot experiment with two-layer soils structure simulating the newly-developed farmland, roots of crops penetrated the recycled soil through 50 cm of covering soil. Additionally, the results suggested that the transferability of radiocesium to crops from the lower layers (removed soil) could possibly be reduced by applying potassium to the covering soil. Furthermore, in the two-layer structure model trial, the radiocesium transfer from soil to crops of pots with soil compaction was lower than that of pots without compaction.

Key Words: potassium, radioactive cesium, recycling, removed soil, transfer factor

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