

## Enhancing Radioactive Fallout Removal from the Surface Soils by using artificial macropore transport system

SATO, Naoki<sup>1\*</sup> ; MIYAMOTO, Tamami<sup>2</sup> ; MORI, Yasushi<sup>1</sup> ; INAO, Eiko<sup>3</sup> ; NOBORIO, Kousuke<sup>4</sup>

<sup>1</sup>Faculty of Environmental Science and Technology,Okayama University, <sup>2</sup>Graduate School of Environmental and Life Science,Okayama University, <sup>3</sup>Miyagi Prefectural Institute of Agriculture and Horticulture, <sup>4</sup>Faculty of Agriculture,Meiji University

Fukushima nuclear power plant damaged by the East Japan Great Earthquake caused radioactive fallout around the Tohokuregion. Because radioactive fallout was positively charged,it was reported to be absorbed to soil surface. Surface soil scraper and deep plowing would be,therefore effective for the removal of radioactive materials. However,these techniques were available for flat and wide area like school yard or farm land.

in many orchards,fruit absorbed radioactive Cesium, which indicated radioactive fallout did not immediately absorb to soil surface but stayed as exchangeable ion for a while and was absorbed by plant root. therefore the technique for sloped land is also needed for better management for radioactive fallout.

we applied artificial macropores to effectively remove radioactive fallout from the surface soil. artificial macropore filled with bamboo fiber was made in soil(Field:d=1 length=50cm,Lab:d=0.6cm,length=20cm). Zeolite was placed at the bottom of the macropores(Field:50cm,Lab:20cm)to absorb transported Cesium.Four treatments were prepared for field experiments,such as macropore with ammonium sulfate,no macropore and no macropore with ammonium sulfate. In the lab experiments, Potassium was used for safety reason and a 400mm artificial rainfall was applied for one month. Results showed artificial macropore effectively transported radioactive Cesium/Potassium to deeper profile. In the lab experiment, artificial ,macropore successfully delivered Potassium to deeper profile while no radioactive Cesium was observed from the drainage water.

Keywords: Macropore, Degraded Soils, Radioactive Substance