

C225933 : MAJOR ENVIRONMENTAL SCIENCE

KEY WORD : SEWAGE SLUDGE/VEGETABLE/HEAVY METAL

SIRANEE SIRISUKHODOM : EFFECT OF SEWAGE SLUDGE ON GROWTH AND HEAVY METAL ACCUMULATION IN VEGETABLES FROM PATHUM THANI AGRICULTURAL AREA.
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Disposal of sewage sludge, which contaminated with heavy metals, to agricultural area for consideration about suitable vegetable species and heavy metal contaminated in the soil. Effects of two sewage sludge application rates (1,600 and 3,200 kg/rai) on growth and heavy metals (Pb, Cd, Ni, Cu, Mn and Fe) accumulation in four vegetables (Chinese Kale, Lettuce, Edible Rape and Kang-Kong) included heavy metals residual in the soil were studied. Field experiment was carried out in an agricultural area at Pathum thani Province by using experimental design 2 x 4 factorial incompletely randomized.

The results showed that applied sewage sludge 1,600 and 3,200 kg/rai gave Chinese Kale and Kang-Kong products equal to add fertilizer (25-7-7) 96 kg/rai. Only Edible Rape at the sewage sludge application rate 3,200 kg/rai gave production significantly higher than added fertilizer. On the other hand, added fertilizer gave Lettuce products higher than applied sewage sludge 1,600 kg/rai. Sewage sludge application at both rate had no effect on accumulation of heavy metals in Chinese Kale and Edible Rape difference among treatments but there were resulted in increased Cu and Fe accumulation in the root system of Lettuce. Applied sewage sludge 3,200 kg/rai enabled the increasing of Zn accumulation in the shoot system of Lettuce and in the root system of Kang-Kong. All of heavy metals accumulated in four vegetables in this experiment were in the range that generally accumulated in plant tissue. The heavy metals content in the vegetables were within acceptable daily intake (ADI) of FAO/WHO.

Residue effect of heavy metals after applied sewage sludge were (1) no significant difference among treatments on Pb, Cd, Cu and Fe contents in the soil (2) increased both Ni content in the soil that grew Edible Rape and Zn content in the soil that grew four vegetables. Moreover, Zn residual in the soil was increased following the increasing rate of sewage sludge application. However heavy metals residual in the soil were in the acceptable range for the agricultural soil.