

## C225900 : MAJOR ENVIRONMENTAL SCIENCE

KEY WORD : VEGETABLE/RICE HUSK/RISK TO HEAVY METAL/SEWAGE SLUDGE

KOMKRIT BHARKTONGSOOK : RISK TO HEAVY METAL ACCUMULATION BY CHINESE KALE (Brassica oleracea L. var. alboglabra Bailey) AND LETTUCE (Lactuca sativa var. crispa) TREATED WITH SEWAGE SLUDGE AND RICE HUSK IN PATHUM THANI AGRICULTURAL AREA. THESIS ADVISOR : ASST.PROF.ORAWAN SIRIRATPIRIYA, D.Sc., 121 PP. ISBN 974-581-410-5

Use of sewage sludge from Bangkok domestic wastewater treatment plant (Huay Kawng community) for utilization as fertilizer to grow Chinese Kale (Brassica oleracea L. var. alboglabra Bailey) and Lettuce (Lactuca sativa var. crispa) with consideration on risk of heavy metal (Pb, Cd, Ni, Mn, Zn, Cu, Fe) accumulation in shoot and root system of plants. Field experiment was carried out at Pathum thani agricultural area. The experiment design was 2 x 4 factorial in - completely randomize with 3 replication of 7 treatment for each plant (control, fertilizer (25-7-7 at 96 kg/rai), sewage sludge (3,200 kg/rai), sewage sludge (3,200 kg/rai) with rice husk 320, 640, 960 and 1,280 kg/rai).

The results showed that sewage sludge had adequate potential for utilization as fertilizer. Applied the sludge 3,200 kg/rai and the sludge 3,200 kg/rai together with rice husk 320 640 960 and 1,280 kg/rai to soil gave Chinese Kale and Lettuce products higher than that of Pathum thani's average product value. Non significant difference among treatments of Chinese Kale product. Applied the sludge gave Chinese Kale product equal to apply the sludge together with rice husk 4 rates. In case of Lettuce, it had significant difference in production among treatments. Lettuce product was decreased after applied the sludge with rice husk than applied only the sludge. This decreasing was followed with the increasing rate of rice husk application. In general, applied sewage sludge with or without rice husk had no effected on increasing vegetables product.

Lettuce had tendency to accumulate the heavy metals higher than Chinese Kale. There had no difference of heavy metals accumulation in shoot and root system of vegetables between applied the sludge with or without rice husk at 4 rates. However, the quantity of heavy metals in vegetables were lower than heavy metals permissible value for vegetable. This quantity also was safe for consumer compared with heavy metal acceptable daily intake (ADI, FAO/WHO). In addition, Pb, Cd and Ni accumulated in vegetables were too less to detect.