African Journal of Agricultural Research

Afr. J. Agric. Res.

Vol. 3 No. 9

African Journal of Agricultural Research Vol. 2(9), pp. 447-454, September, 2007
ISSN 1991- 637X© 2007 Academic Journals

Full Length Research Paper

Effect of plantation pattern on the efficiency of subsurface flow constructed wetland (sfcw) for sewage treatment

Suntud Sirianuntapiboon and Sontidej Jitvimolnimit

Department of Environmental Technology, School of Energy Environment and Materials, King Mongkut's University of Technology Thonburi (KMUTT),Bangkok 10140, Thailand.

*Corresponding author. E-mail: suntud.sir@kmutt.ac.th

Accepted 13 July, 2007

Abstract

The subsurface flow constructed wetland system (SFCW) with mono- and mixed-cultures of *Typha latifolia* and *Canna siamensis* could be applied for sewage treatment. The system efficiency was decreased with the decrease of HRT, excepted for nitrate removal. Both types of cultivated-plant did not show any difference on SS, BOD_5, ammonium-N_2, nitrate-N_2 and total phosphorus removal efficiencies. But, SFCW with mixed-cultures showed the highest phosphorus and nitrate removal efficiencies. Also, it gave the highest plant-biomass production yield. Phosphorus was highly accumulated in the plant tissue while, nitrogen was highly accumulated in the media. Number of bacteria of the system was not difference among plant species and plantation pattern, but it was decreased with the decreased of HRT. Then, the removal efficiencies of the system with both mono- and mixed-cultures were highest at the longest HRT operation of 6 days except for nitrate removal. The highest SS, $BOD_{5,}$ ammonia-N_2 and total phosphorus removal efficiencies were about 91, 91, 86 and 87%, respectively were obtained in SFCW with both mono- and mixed-cultures.

Key words: Plantation pattern, hydraulic retention time (HRT), vertical-flow constructed wetland, *Typha latifolia*, *Canna siamensis*.