

Orrathai Chueawong 2007: Study on Phetchaburi Municipal Wastewater Treatment by 3 Varieties of *Canna* spp. in Alternating Flooding and Drying Soil and Plant System. Master of Science (Environmental Science), Major Field: Environmental Science, College of Environment. Thesis Advisor: Associate Professor Paiboon Prabuddham, Ph.D. 197 pages.

This municipal wastewater treatment by alternating 5 days flooding and 2 days drying soil and plant system was carried out by Split Plot Design using the wastewater and irrigated water as mainplot and 3 *Canna* spp. varieties: *Canna* Russian Red, *Canna* Rigoletto and *Canna* Rosever and a bared plot as subplot. These are the following summarized results.

Most BOD, T-N, $\text{NH}_4\text{-N}$ and T-P of the wastewater were in the ranges : 31.2 ± 13.9 , 22.7 ± 5.3 , 19.5 ± 5.8 and 4.00 ± 0.1 mg/l respectively. Most of its pH were in the range 7.8 ± 0.3 . After treatment, in the 4 subplots most of BOD were in the range 1.6 ± 0.6 , 1.9 ± 1.2 , 1.5 ± 0.9 and 1.4 ± 0.7 mg/l ; most pH were in the range 7.3 ± 0.6 , 7.2 ± 0.4 , 7.4 ± 0.5 and 7.4 ± 0.5 ; while that of the T-N, $\text{NH}_4\text{-N}$ and T-P were in the range 1.7 ± 0.2 , 1.3 ± 0.2 , 1.5 ± 0.4 and 1.8 ± 0.3 ; 0.6 ± 0.2 , 0.5 ± 0.2 , 0.6 ± 0.2 and 0.6 ± 0.0 ; and 0.05 ± 0.0 , 0.06 ± 0.0 , 0.05 ± 0.0 and 0.05 ± 0.0 mg/l respectively.

Efficiencies of the wastewater BOD treatment in the 4 subplots were in the range 96.2 ± 1.9 , 94.5 ± 5.8 , 95.7 ± 4.1 and 96.3 ± 3.2 % ; while that of the T-N, $\text{NH}_4\text{-N}$ and T-P were in the range 95.2 ± 2.1 , 96.6 ± 1.0 , 96.2 ± 1.9 and 95.1 ± 1.7 ; 98.1 ± 1.0 , 98.1 ± 0.8 , 97.9 ± 0.9 and 98.0 ± 0.6 ; and 99.2 ± 0.2 , 99.0 ± 0.2 , 99.2 ± 0.2 and 99.2 ± 0.1 % respectively.

All growth indicators and the plant N and P contents studied in the wastewater plots were statistically higher than that of the irrigation water ones. In the subplots, all growth indicators and the plant N and P contents were statistically higher in the tall varieties than the short one but the two tall varieties had no statistically difference. This wastewater treatment system can be used in all communities having BOD as dominant pollutants.

Orrathai Chueawong Paiboon Prabuddham 22 March 07
Student's signature Thesis Advisor's signature