

Navy Chanwong 2009: Study on Phetchaburi Municipal Wastewater Treatment Efficiency by 3 Forage Grasses in Alternate Flooding and Drying Soil System. Master of Science (Environmental Science), Major Field: Environmental Science, Collage of Environment. Thesis Advisor: Associate Professor Paiboon Prabuddham, Ph.D. 236 pages.

In order to study treatment efficiency of Phetchaburi municipal wastewater by the alternating flooding (5 days) and drying (2 days) and Forage Grasses system and to verify the treatment mechanisms either by the vertical one of facultative anaerobes or/and the horizontal one of the aerobes, a Split Plot Design experiment, having the wastewater ( $W_1$ ) and irrigation water ( $W_2$ ) as mainplots and 3 Forage Grasses *Cynodon plectostachyus* ( $P_1$ ), *Cynodon plectostachyus* ( $P_2$ ), *Paspalum. Ubon* ( $P_3$ ) and a bared soil (S) as subplots in 3 blocks, has been carried out in this system for 7 cycles of 7 days (5/2). To avoid unfaired chance of plant nutrient absorption from soil of nodes of the creeping  $P_1$  grass in the 1 m.pots used, 9.6 gN/pot of ureas was top dressed in all pots just after harvesting the grasses at 4 weeks old after treatment. These are the summarized results;

a. Before treatment most of the range concentrations of BOD, T-N,  $NH_4$ -N and T-P of  $W_1$  were  $51.3 \pm 17.1$ ,  $45.2 \pm 4.5$ ,  $14.9 \pm 3.2$  and  $5.1 \pm 0.8$  mg/l respectively. Most of its pH were in the range  $7.4 \pm 0.2$ , b. After treatment, the treatment efficiencies (%) of BOD and other indicators were in the order  $W_1 > W_2$  significantly; that is, most of the ranges were;  $92.5 \pm 3.2$  and  $87.9 \pm 3.9$ ;  $96.3 \pm 0.4$  and  $71.8 \pm 8.3$ ;  $94.2 \pm 2.2$  and  $60.8 \pm 8.0$ ; and  $96.5 \pm 0.5$  and  $42.2 \pm 5.6$  for the earlier mentioned sequences respectively, c. Influences of the plants on the treatment efficiencies (%) of BOD and the mentioned sequential indicators were nonsignificant difference, most of the ranges (a)  $90.3 \pm 2.4$ ,  $89.6 \pm 3.5$ ,  $89.8 \pm 4.2$  and  $91.3 \pm 2.3$ ; (b)  $84.5 \pm 4.2$ ,  $87.3 \pm 4.7$ ,  $86.3 \pm 4.0$  and  $81.8 \pm 3.8$  (c)  $77.6 \pm 4.1$ ,  $76.7 \pm 5.9$ ;  $76.1 \pm 6.1$  and  $79.9 \pm 2.8$ ; (d)  $69.9 \pm 3.7$ ,  $69.7 \pm 3.4$ ,  $65.7 \pm 5.7$  and  $70.3 \pm 4.2$  in  $P_1$ ,  $P_2$ ,  $P_3$  and S plots for the mentioned sequential indicators, d. The vertical treatment mechanism was the treatment main factor controlling organic pollutants of this system, e.  $W_1$  significantly promoted the forage grass both the height since 3-7 weeks, and the yields of both fresh and dry ones and uptake of N at 4, 6 and 8 weeks old, f. Urea top dressing to all plats improved the N content of the roughage which have been earlier difficant, to meet the standard quality, order and g. Pure effect of the subplot in most agronomic indicators in the first 6 weeks of the trios were highly significant and in the  $P_1 > P_3 > P_2$  but at 8 weeks old, only plant height was significant difference in the order  $P_1 > P_3 \simeq P_2$

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