

WASTEWATER TREATMENT AT A SEAFOOD PROCESSING FACTORY IN THE MEKONG DELTA, VIETNAM

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Abstract

Due to the effectiveness of VS in treating wastewater and the current trend in water recycling around the world, the seafood processing factory, CAFATEX, was interested in testing VS as a method of phytoremediation to reduce the contaminant levels in the factory effluent. The emphasis is on the low cost and simple VS alternative instead of more costly chemical and engineering solutions.

Cantho City is the capital of the Mekong Delta, which is also the centre of several food processing industries. The seafood processing factories are the major sources of pollution to the region watercourses and farmlands nearby.

Two demonstration trials were set up at the factory as a part of the Wallace Genetic Foundation "Water Quality Improvement program":

One trial was set up on an area of about 800m². The aim of this trial was to determine the treatment time required to retain effluent in the vetiver field to reduce nitrate and phosphate concentrations in effluent to acceptable levels. The experiment started when plants were 7 months old. Water samples were taken for analysis at 24 hour interval for 3 days. Analytical results showed that total N content in wastewater was reduced by 88% and 91% after 48 and 72 hours of treatment, respectively. While the total P was reduced by to 80% and 82% after 48 and 72 hours of treatment. The amount of total N and P removed in 48 and 72 hour treatments were not significantly different.

The other trial was established to determine the capacity of Vetiver grass in absorbing nitrate and phosphate in wastewater under the local conditions. Plant density and field design were similar to those of the above experiment. As this trial was set up 2 months after the above experiment, so experiment started when plants were only 5 month old. Wastewater was pumped into each replicate then water samples were collected for analysis at 24 hour interval for 3 days.

The total N was reduced by 25% after 24 hours of treatment and 63% after 48 and 72 hours. No significant difference between 48 and 72 hours of treatments. Similarly, total P was reduced by 30% after 24 hours and 72% after 48 and 72 hours. No significant difference between 48 and 72 hours of treatments. The lower removal rate of Vetiver in this trial may be

due to the fact that plants in this trial was 2 months younger than that of vetiver in above experiment, as they have smaller root system to absorb N and P.

In short, the preliminary results of these experiments showed that this seafood processing company should retain its effluent for 48 hours in the vetiver field before discharging into the nearby creek. However, before Vetiver technology can be actually applied in this factory, intensive monitoring should be repeated several times in order to firmly establish the effectiveness of vetiver grass in absorbing N and P in wastewater. In addition an intensive operational plan in term of harvesting frequency and maintenance schedule has to be set up for the company.

KEY WORDS: Industrial effluent, N and P removal, Mekong Delta