卒業論文要旨

Evaluation of the capability of water purification by hydroponic culture with water spinach and water cress and a proposal of recycling type of water treatment system

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空芯菜とクレソンの水質浄化能力評価と二次生産型汚水処理システムの提案

藤巻美紀

Artificial wetland system of removing the nutrients (N, P) in the wastewater is a low cost eco-technology application with less burden on the costly operation and maintenance. The system of treating the controlled wastewater by aquatic plants of water spinach and cress has been developed since 1990s by taking into account of the efficient reproduction capacity of the commercial crops with benefit. The efficiency of the nutrient removal is dependent on the water quality and climatic conditions in the region. The purpose of this study is to propose the new application of artificial wetland system to treat the wastewater from the hydroponic culture as well as cultivating the commercial vegetables by examining the absorption capacity of the nutrients and growing speed of the plants in the model farm. The simple eco- technology application with 3R concept (Reduce-Recycle-Reuse) has a two-hold significance to secure the sustainable fresh food supply and vulnerable local economy of the farmers.

No significant difference in the nutrient removal and growing speed is observed in the hydroponic culture with water spinach among the different N-P concentration of the wastewater. The growth rate with salinity level of 2,000 mg/l of wastewater is, however, slightly decreased by steps. The proposed hydroponic culture system is an efficient low cost eco-technology application of the artificial wetland to take into account of the adaptation capacity on the different nutrient and salinity levels of the source wastewater.