Mathematical modelling of the influenced of diffusion rate on macro nutrient availability in paddy field

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Abstract	Nutrition is the chemical compounds that needed by the organism for the growth process. In plants, nutrients are organic or inorganic compounds that are absorbed from the roots of the soil. It consist of macro and micro nutrient. Macro nutrients are nutrition that needed by plants in large quantities, such as, nitrogen, calcium, pottacium, magnesium, and sulfur. The total soil nutrient is the difference between the input nutrient and the output nutrients. Input nutrients are nutrient that derived from the decomposition of organic substances. Meanwhile, the output nutrient consists of the nutrients that absorbed by plant roots (uptake), the evaporated nutrients (volatilized) and leached nutrients. The nutrient transport can be done through diffusion process. The diffusion process is essential in removing the nutrient from one place to the root surface. It will cause the rate of absorption of nutrient by the roots will be greater. Nutrient concept in paddy filed can be represented into a mathematical modelling, by making compartment models. The rate of concentration change in the compartment model forms a system of homogeneous linear differential equations. In this research, we will use Laplaces transformation to solve the compartment model and determined the dynamics of macro nutrition due to diffusion process.
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