

MODELING THE EFFECT OF SOIL AMENDMENTS (COMPOSTS) ON WATER BALANCE AND WATER QUALITY

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ABSTRACT

Nutrient loadings from agricultural and urban areas have increased nutrient concentrations in water, particularly phosphorus at the Everglades National Park. The soils in the region are mainly crushed limestone with low water holding capacity, high permeability, low organic matter, and low fertility. Application of composts as a soil amendment promises improved water holding capacity and chemical retention. The USDA Everglades Agro-Hydrology Model (EAHM) has been developed to evaluate the impact of agricultural practices on crop production, water balance, and the fate and transport of nutrients and pesticides. The model was modified to simulate the effect of different types and amounts of compost applications on water balance, yield and agro-chemical transport on a typical farm in south Florida. The model was used to select the best management practices (BMPs) while considering the long-term impact of composting on soil water balance, crop yield, and the fate and transport of nitrogen and a pesticide (atrazine) on a South Florida agricultural farm. Considering the poor soil quality, the model simulation test indicated that the application of 90 to 134 T.ha⁻¹ of compost annually will result in an increase of soil water content, crop yield, and reduced water seepage below the root zone, thus reducing the potential for N and atrazine to leach into groundwater.

Reference: Savabi, M.R., D. Shinde, K. Konomi, P. Nkedi-Kizza, and K. Jayachandran.2005. Modeling the Effect of Soil Amendments (Composts) on Water Balance and Water Quality, Journal of Environmental Hydrology, Vol. 13, Paper 31.

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