The effect of biochar and digestate on Green-house gas and NH3 emissions during composting of different organic inputs in small scale livestock farm in Vietnam

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Introduction

Green house gas (GHGs) emissions are known as one of the most imminent problems in the world and Vietnam is not an exception. There are many reasons leading to GHGs emission from the agricultural sector, such as animal manure and crop residue management, transportation, fertilizer and pesticide production and use, etc. The intervention on ***the animal manure and crop residue managements*** has a significant potential to reduce agricultural GHGs emissions.

After fermenting the manure in a biogas digester the manure will contain less organic matter, but the slowly digestible organic fraction will be dominant (Sommer et al. 2004). Beside after pyrolysis of rice straw, biochar also contain slowly digestible organic fraction. Digestate and biochar therefore will contribute to reducing GHGs emission during composting process when farmer composted them with crop residues.

Therefore, pilot experiments "The effect of the biochar and digestate on green-house gas emissions during composting of different organic input in small scale livestock farm in Vietnam" be conducted. **Objective of project is** to quantify GHGs emission reduction in treatments composting digestate with rice straw or bio-char in comparison with traditional composting (only manure or manure with rice straw).

Material and method

Experimental site

The field experiment was carried in green house of Institute for Soil and Fertilizer in Hanoi, Vietnam from March to June 2012

The treatments

T1. Manure (solid)

T2: Manure (solid) + rice straw (20 :1 by weight)

T3. Biogas Digestate (liquid) + rice straw (5 liter* : 1 kg)

T4. Biogas Digestate + rice straw (3,5 liter : 1 kg)

T5. Biogas Digestate + sugar cane (5,5 liter : 1 kg)

T6 Biogas Digestate + Biochar from rice straw (3,5 liter : 1 kg)

T7. Biogas Digestate + rice straw + Biochar from rice straw (8,5 liter : 1 kg : 1 kg)

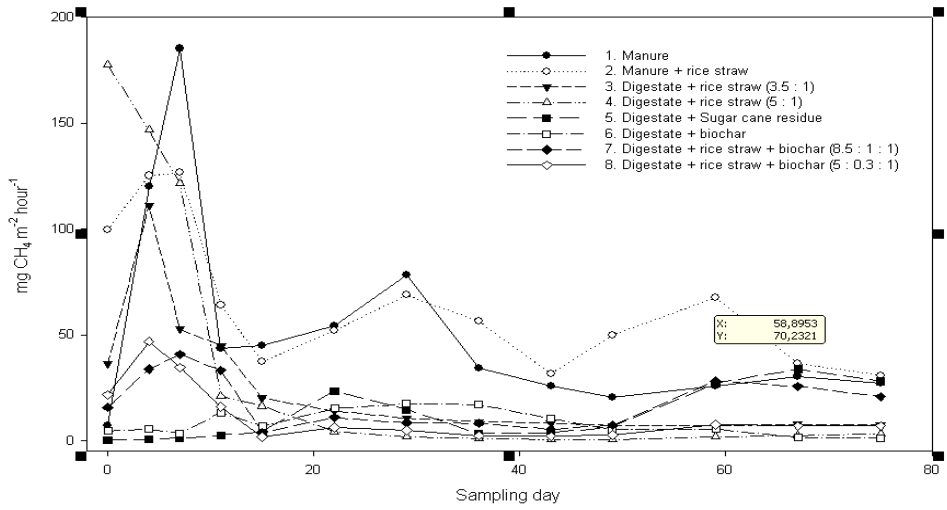
T8. Biogas Digestate + rice straw + Biochar from rice straw (5 liter : 0.3 kg : 1 kg)

Monitoring indicators Humidity, C/N before and after composting

GHGs (CH_4, CO_2, NO_2) and NH_3 samples will be taken 13 and 8 times, respectively during 3 months of composting.

Gas sample will be transported to KU-LIFE laboratory to analyze CH_4, CO_2 and N_2O by GC,

Results



References

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Keywords

GHGs and NH3 emission