



Prof. MAEDA Morihiro



How to reduce greenhouse gas emissions from soil amended with organic matter?

Agriculture is responsible for emissions of greenhouse gases such as carbon dioxide (CO_2) and nitrous oxide (N_2O). Production of these gases in soil results from the biological processes like organic matter decomposition, nitrification and denitrification. These processes are regulated by easily decomposable carbon, mineral nitrogen, temperature, pH and moisture content in soil. We aim at analyzing effects of these parameters on CO_2 and N_2O emissions. In particular, we are interested in agricultural soil amended with livestock compost.



Analysis of groundwater contamination with inorganic N in Central Vietnam by using stable isotopes and microbial technologies



High concentrations of inorganic nitrogen ($\text{NH}_4\text{-N}$ and/or $\text{NO}_3\text{-N}$) were found in groundwater below vegetable fields in the downstream areas of the Huong River, Central Vietnam. The objective of the study is to determine the contamination sources and mechanisms of nitrogen contamination in groundwater by using ^{15}N natural abundance ($\delta^{15}\text{N}$) and functional genes of microorganisms. We have developed a new method to collect $\text{NH}_4\text{-N}$, $\text{NO}_3\text{-N}$, and organic N in water samples for $\delta^{15}\text{N}$ analysis. Functional genes like *narG*, *napK*, and *nosZ* are quantified to obtain the information on nitrogen dynamics in deep soil.