Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

AGE04-06 Room:101A Time:May 20 10:45-11:00

Behaviors of carbon dioxide in soils as affected by tillage systems

GUO, Linlin[1*], MIYAZAKI, Tsuyoshi[1], NISHIMURA, Taku[1], IMOTO, Hiromi[1]

[1]University of Tokyo

Agricultural practices have the potential to store or emit greenhouse gas which is a crucial part of sustainable development. Therefore the study of carbon sequestration especially the behaviors of carbon dioxide in soils under different agricultural practices are so significant. Considered about tillage is one of the most important agricultural managements and some contradictions also existed in recent literatures, this research aimed at the effects of tillage management on carbon dioxide behaviors (CO_2 flux, concentration) and carbon store in soil. We sampled the undisturbed soil columns from the field and incubated in greenhouse that the temperature and water content were controlled. The results indicated that: The cumulated CO_2 flux of tillage soil was 377.8g m^{-2} that was greater than no tillage soil (332.3 g m^{-2}) during the whole incubation period. But the significant higher CO_2 concentrations in no tillage soil profile were measured compared with the tillage soil especially in the 7.5cm, 12.5cm, 20cm and 30cm depth. The result did not coincide with the general situation that high concentration may reflect the high production of CO_2. Also soil environment such as temperature, water content and structure were different under two tillage systems. In general CO_2 behaviors and carbon cycling in soil were affected by tillage systems and the mechanism of the impacts on CO_2 production and transfer will be detailed analyzed in the presentation.

Keywords: Tillage systems, CO_2 flux, CO_2 concentrations, Soil carbon, Incubation experiment