Entry No. IRRC-0018

Category	: International Rice Research Conference
Select Theme	: Climate change and environmental sustainability
Endorsement email	:
Keyword 1	: Mitigation of climate change
Keyword 2	: Adaptation to climate change
Keyword 3	: Climate smart agriculture
Title of Entry	: Daily variation of CH4, CO2 and N2O emission fluxes continuously monitored in-situ in rice fields of the Ebro Delta.
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Select only one type of presentation	: 3-5 minute flash talk
Abstract	: Global warming has already had a significant effect on the Earth's environment, ecosystem, and climate. Rice fields play a crucial role in atmospheric emissions of greenhouse gases (GHGs) such as carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). In the frame of the Life project Ebro-Admiclim (LIFE 13 ENV/ES/001182); a study was conducted in a Mediterranean rice agrosystem (Ebro Delta, Catalonia) in a local farmer field with typically managed rice cropping to monitored in-situ the concentrations of GHGs evaluating the variation of emission fluxes continuously by 24 hours for three years (2015, 2016, 2017). The fluxes were collected over a 30-minutes period, to obtain the linear increase of gas concentration at each sampling time (0, 10, 20 and 30 min) every two hours, using the static chamber technique. GHG were analyzed by gas chromatography (Gc Trace 2000). Simultaneously, the physical-chemical soil-water parameters were measured. The results showed a slight tendency to increase and significant differences with other studies that apply a similar methodology. Emissions rates ranged from 2.1±0.5 to 7.2±1.4 mg C-CH4 m-2 h-1, 1.5 ± 0.5 to 8.1 ± 0.5 mg C-CO2 m-2 h-1 and 0.01 to 0.16 mg N-N2O m-2 h-1. The physical-chemical soil/water parameters are important variables to explain the GHG emissions. The PCA shows: negative correlation between CH4 and temperature, probably the physiological activity of the plant, concretely the diffusion of O2 to the rhizosphere through aerenchym infers in the decrease of the methanogenic activity. Highlighted that the variability observed in the plant cover allows identifying a positive correlation with the methane flux; confirming that the rice plants has the capacity to emit the GHGs, from the rhizosphere to the atmosphere. The CO2 concentration changed more obviously at nighttime compared with daytime. Many N2O fluxes were triggered by the mid-season fertilizations episodes. Read Less»

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