Global Summit on
AGRICULTURE, FOOD SCIENCE AND TECHNOLOGY
October 26-27, 2018 | Boston, USA

Greenhouse gas emissions and agro-physiological response of rice under drip irrigation with plastic-film-mulch

Oluwasegun Olamide Fawibe[1,2], **Yuki Taguchi**[1], **Sangsoo Park**[1] and **Akihiro Isoda**[1]
[1]Chiba University, Matsudo, Japan
[2]Federal University of Agriculture, Nigeria

The increasing water scarcity and the need to produce more rice to feed the burgeoning population under sustainable environment have become a task to crop production. A field experiment was conducted to investigate the emission of CH_4 and N_2O and the response of rice yield, water productivity and physiological traits of rice cultivars to drip irrigation with plastic-film-mulch (DP) in comparison to the continuous flooding (CF) in 2016 and 2017. DP reduced accumulated CH_4 flux by 178% and 78.5% in 2016 and 2017 respectively as compared to CF. In both years, significant differences in N_2O fluxes were not observed between treatments at $P<0.05$. The grain yields of Koshihikari (7.0g/m^2 and 7.4g/m^2) and Norin 24 (8.0g/m^2 and 8.4g/m^2) under DP and CF respectively were insignificant ($P<0.05$) but Princessari cultivar resulted in 53% yield reduction under DP compared to CF. Also, DP significantly increased water use efficiency (WUE) by 93.8% and 94.6% for Koshihikari and Norin 24 respectively but showed 5% reduction for Princessari compared to CF. The decrease in the maximum quantum yield (Fv/Fm), actual quantum yield (ΔF/Fm') of Princessari cultivar at the grain filling stage indicated the down-regulation of photosystem II (PSII) attributable to water stress. The average global warming potential (GWP) of the GHGs during the rice growing seasons was 45 times lower under DP than CF. These results indicate that DP could mitigate greenhouse gas emission without yield loss in addition to saving water.

Biography

Fawibe Oluwasegun Olamide is a current second year PhD student of the Faculty of Environmental Horticulture, Chiba University, Japan. He is an awardee of the Japanese Government Scholarship (MEXT). He had a Bachelor's degree in Biological Sciences (First class) and a Masters in Botany (Plant physiology) at the Federal University of Agriculture Abeokuta, Nigeria. He has published more than 6 papers in reputed journals.

fawibeoo@funaab.edu.ng

Notes: