



RIO18
21st World Congress
of Soil Science

21 WORLD CONGRESS OF SOIL SCIENCE

Sunday 12 – Friday 17 August 2018

Rio de Janeiro, Brazil

Rio de Janeiro August | 12 - 17

The impact of nitrogen fertilizer management on nitrous oxide and ammonia emission in an irrigated rice crop system in the Brazilian Savannah

Beata Eموke Madari¹; Glaucilene Duarte Carvalho²; Alberto Baêta dos Santos¹; Mellissa Ananias Soler da Silva¹; Márcia Thaís de Melo Carvalho¹

Embrapa Arroz e Feijão¹; Embrapa Arroz e Feijão / Univ. Fed. Goiás²

The lack of synchronism between nitrogen (N) fertilization and the stage of high demand by plants results in a low efficiency recovery of N in the cropping system, mainly due to losses of N. The objective of this study was to estimate the gaseous losses of N (N₂O and NH₃ emission) and characterize the dynamics of N-N₂O fluxes in an irrigated rice production system of the Brazilian Savannah. The experiment was conducted on a Gleissol, located at the *Meia Ponte* river basin, along two cropping seasons 2011/2012 (S1) and 2012/2013 (S2). The cultivar used was BRS Tropical. The experiment consisted of three treatments: (T0) control (without N); (T1) application of recommended dose of N (110 kg ha⁻¹); and (T2) application of N based on reference index using the Minolta SPAD-502 chlorophyll meter. Fluxes of N₂O and volatilization of NH₃ were quantified using manual static chambers. Soil variables related to gaseous losses were also monitored along seasons. The highest N-N₂O fluxes occurred soon after sowing at the period before flooding. These fluxes were related to soil moisture and nitrate availability. The emission factor for N₂O due to nitrogen fertilization was low (0.3%). The volatilization intensity (g NH₃ emitted per kg of grain produced) was lower for T2. The total loss of N was greater along the off-season period than along the cropping seasons.

Keywords: nitrogen, inundation, chlorophyll meter, emission factor, neotropical Savannah

Financial Support: Embrapa, FAPEG - Goiás Research Foundation. This work was also undertaken as part of NUCLEUS, a virtual joint centre to deliver enhanced N-use efficiency via an integrated soil-plant systems approach for the United Kingdom and Brazil.



**Brazilian Soil Science
Society**

<https://www.21wcss.org>
21wcss@21wcss.org
commercial@21wcss.org