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[Author Index](#)

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108654 Ammonia Emissions from N-Fertilization of Maize and Common Bean Grown in a Brazilian Cerrado Oxisol.

Poster Number 910

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See more from this Session: [Enhanced Efficiency N Fertilizers/N Management/Volatile N Loss Poster](#)

Wednesday, October 25, 2017

Tampa Convention Center, East Exhibit Hall

Maria da Conceição Santana Carvalho, Embrapa Arroz e Feijão, EMBRAPA - Empresa Brasileira de Pesquisa Agropecuária, Santo Antônio de Goiás, , BRAZIL, Nelson Horowitz, Yara Brasil Fertilizantes SA, Porto Alegre, Brazil and Adriano Stephan Nascente, Goiás State, Embrapa Arroz e Feijão, Santo Antonio de Goiás, BRAZIL

Abstract:

The Cerrado region is responsible for more than 50% of maize (*Zea mays* L.) and common bean (*Phaseolus vulgaris* L.) produced in Brazil. These crops are large consumers of synthetic N-fertilizers in Brazil, which is an agricultural practice of growing environmental concern as one important source of Greenhouse Gas Emissions. During three growing seasons, we quantified NH_3 emissions from three fertilizers applied on maize and on common bean grown in a clayly Oxisol in the State of Goiás, Brazil. The fertilizers evaluated were calcium ammonium nitrate - CAN, urea, and ammonium sulfate. The rates of N applied were 150 kg ha^{-1} (maize in 2013/14 growing season), 100 kg ha^{-1} (maize in 2014/15 and 2015/16 growing season), and 80 kg ha^{-1} (common bean in 2015/16 growing season). We also evaluated NH_3 emissions from a control treatment, without N application. The treatments were arranged in a randomized block design with five replications. Urea presented the higher NH_3 -N emissions in all growing seasons. In 2013/14 growing season, the cumulative N loss as NH_3 volatilized from urea was 7.11 %, which was higher than ammonium sulfate (2.4%) and CAN (0.9 %). In 2014/15 growing season, the cumulative N loss by NH_3 volatilization was estimated at 30%, while the NH_3 -N loss from CAN and ammonium sulphate were 2.4% and 2.6%, respectively. In 2015/16 growing season, the NH_3 -N loss from urea corresponded to 9.5% of N applied for maize and to 3.4% for common bean, while for the other two fertilizers NH_3 -N losses were lower than 0.7%. The NH_3 volatilization occurred from one to eight days after fertilizers application, although the main losses occur in the first three or four days. There was no difference among the fertilizers in agronomic evaluations, except for the apparent N recovery, which was a little lower for urea.

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[<< Previous Abstract](#) | [Next Abstract >>](#)

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