

29.3-P: NO and N₂O Emissions Related to the Nitrogen Fertilization in a Cornfield Under No-tillage and Tillage Systems

Arminda Moreira de Carvalho, EMBRAPA, UnB, arminda@unb.br (Apresentador / Presenting)

Mercedes Maria Cunha Bustamante, UnB, mercedes@unb.br

Alessandra Rodrigues Kozovits, UnB, kozovits@unb.br

Danielle Matias Sousa, UnB, daniellematias@yahoo.com.br

Laura Tillman Viana, UnB, lviana@unb.br

Leo Nobre de Miranda, UnB, leo@embrapa.cpac.br

The dynamic of nitrogen oxides emissions from Cerrado soils related to the nitrogen fertilization is still not well known, in spite of the intensification of agricultural activities in this region. NO and N₂O emissions were measured immediately and up to five days after nitrogen fertilization in a cornfield, under no-tillage and tillage systems, in the Cerrado region.

The experiment was conducted at EMBRAPA-Cerrados (Planaltina-DF), mucuna-preta/corn succession on a Oxisol.

Associated with irrigation, 20 kg ha⁻¹ N (at the sowing) and 60 kg ha⁻¹ N-urea (cover) were applied. The experimental design used was random blocks, in no-tillage and tillage systems. The fluxes were determined immediately, one, two, three and five days after nitrogen cover. In each plot, fluxes of NO and N₂O were measured in four and three PVC chambers, respectively.

Higher NO fluxes were found immediately (4 to 6 ng NO-N cm⁻² h⁻¹) and 3 days after N fertilization (3.5 to 5.5 ng NO-N cm⁻² h⁻¹). The lowest fluxes were found after five days (0.7 to 2.7 ng NO-N cm⁻² h⁻¹). In general, the no-tillage block showed higher fluxes soon after the N fertilization compared to the tillage block. On the other hand, the tillage blocks presented higher fluxes in the third day. Most of the N₂O fluxes values were below the detection limit (0.6 ng N₂O-N cm⁻² h⁻¹), except in the first and third day, when higher emissions (2.6 and 0.63 ng N₂O-N cm⁻² h⁻¹) were measured observed in the no-tillage blocks. NO and N₂O emissions were not correlated with air and soil temperature and soil moisture. The results suggest an immediate pulse in the NO emission after fertilization and irrigation, and a second pulse after three days. After five days, the fluxes were reduced to the background levels (around 1.2 ng NO-N cm⁻² h⁻¹).

29.4-P: Mapeamento temporal de áreas alagadas na planície de inundação da Amazônia: "input" para estimativas de emissão de metano

Maycira Costa, University of Victoria/Instituto Nacional de Pesquisas Espaciais, maycira@office.geog.uvic.ca

Dayson J.J. Lima, Instituto Nacional de Pesquisas Espaciais, dayson@ltd.inpe.br (Apresentador / Presenting)

John Melack, University of California in Santa Barbara, melack@lifesci.ucsb.edu

Denival S. Correa, Universidade do Para - Santarem, denivalsilvacorrea@hotmail.com

Laura Hess, University of California in Santa Barbara, lola@icess.ucsb.edu

Imagens dos satélites RADARSAT e ENVISAT foram utilizadas para o mapeamento temporal de áreas alagadas da planície de inundação em duas localidades na Amazônia, Lago Grande de Monte Alegre e Lago Grande de Curuai. As imagens foram adquiridas em dezembro, 2003, janeiro, fevereiro e março de 2004, com a seguinte configuração: Radarsat - 27o de ângulo de incidência, banda C, polarização HH; ENVISAT - 27o de ângulo de incidência, banda C, polarizações HH e VV. Atividades de campo foram realizadas concomitantes a aquisição das imagens de radar objetivando descrever temporalmente os diferentes tipos de vegetação e biomassa de plantas aquáticas emersas. As imagens de radar foram radiometricamente e geometricamente calibradas, e classificadas segundo um processo de segmentação automática seguido de classificação supervisionada. Os resultados permitiram a geração de mapas temáticos temporais da distribuição espacial de inundação dos diferentes ecossistemas das regiões de estudo.

29.5-P: Trace Gas Emissions From the Soil Related to Land-Use Changes in the Cerrado Region

Alessandra Rodrigues Kozovits, Universidade de Brasília, kozovits@unb.br (Apresentador / Presenting)

Laura Tillman Viana, Universidade de Brasília, lviana@unb.br

Danielle Matias Sousa, Universidade de Brasília, daniellematias@yahoo.com.br

Mercedes Maria Cunha Bustamante, Universidade de Brasília, mercedes@unb.br

Richard Zepp, Environmental Protection Agency, zepp.richard@epamail.epa.gov

The conversion of native Cerrado areas (savannas of central Brazil) into croplands, may change the magnitude and dynamics of soil trace gases emissions. We measured NO, N₂O and CO₂ fluxes, soil moisture, available inorganic N and net mineralization rate in areas planted with corn, soybean and common bean and in adjacent native Cerrado areas. These crops are the most important in the region. Data collection followed the crop management (just before and after each fertilization) and also monthly during the growth season. The study has been conducted at the Fazenda Dom Bosco, about 100 Km from Brasília. Higher NO soil emissions were found in the corn (up to 9.44 ng NO cm⁻² h⁻¹) and bean (up to 8.87 ng NO cm⁻² h⁻¹) areas compared to native Cerrado and soybean areas (1.08 and 0.67 ng NO cm⁻² h⁻¹, respectively) and accompanying the status of available N in the soil. The net N mineralization and net nitrification dynamics were similar in the two legume crops, with immobilisation before the plantation and mineralization just after the sowing. In the native area, there was net mineralization during the dry season and immobilisation with the onset of the rain season. Generally, N₂O was under the detection limit (0.6 ng N₂O cm⁻² h⁻¹). Higher values were observed in the cornfield just after N fertilization (1.84 ng N₂O cm⁻² h⁻¹). In contrast to the N emissions, soil respiration from all studied sites seemed to be closely related to the soil moisture, tending to be higher in the crop areas (2.81 to 6.41 μmolCO₂ m⁻² s⁻¹). The results indicate a clearly increase in the NO emissions with the replacement of native Cerrado areas by fertilized crops. Emissions from the soybean area were similar to the native Cerrado although post-harvest measurements were still not taken.

29.6-P: NO fluxes from savannas of Central Brazil (Cerrado) subjected to nitrogen and phosphorus fertilization

Alessandra Rodrigues Kozovits, Universidade de Brasília, kozovits@unb.br (Apresentador / Presenting)

Laura Tillman Viana, Universidade de Brasília, lviana@unb.br