Vinasse effect on nitrous oxide emission during initial developing of sugar cane in São Paulo State, Brazil.

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The aim of this study was to evaluate the vinasse effect on the nitrous oxide emission from a ratoon sugar cane soil. The variable of this study was the vinasse (TV) or not (TNV). All rows of plots were fertilized with nitrogen as ammonium nitrate (120 kg N ha-1) to the soil surface. Same potassium amount (150 kg K2O ha-1) was applied by potassium chloride fertilizer or vinasse. The dosage of vinasse (56 m3 ha-1) provided additional nitrogen (24 kg N ha-1) to treatment TV. The gas was collected using a 60 ml syringe into two PVC cylindrical chambers positioned in central row of each plot. Amount fertilizer and vinasse applied was calculated according to chamber area. The experiment was installed in November 2010 and the gas collection occurred at 1, 2, 4, 6, 8, 11, 14, 18, 22, 26, 29, 50 and 71 days after the installation. The final gas flow was determined by linear regression curve originated from the values collected in 1, 10, 20 and 30 minutes for each chamber. Samples were analyzed by gas chromatography using an electron capture detector. Mathematica 6.0 software program was used to compute the nitrous oxide emission in the period of 82 days. The fluxes, highest at the first month of the experiment, ranged from 0.84 mg N2O m-2 day-1 to 30.41 mg N2O m-2 day-1 in treatment TNV and from 1.2 mg N2O m-2 day-1 to 28.8 mg N2O m-2 day-1 in treatment TV. Accumulated emission were 38.4 mg N2O in treatment TNV and 44.2 mg N2O in the treatment TV, representing N-N2O emission factor of 0.71% and 0.79% respectively, during the period analyzed (82 days).

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