



N₂O fluxes evaluation in pasture management system under different densities of babassu palms

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Introduction

The intensification of beef cattle production systems for recuperation of degraded pasture and increase animal support capacity in the Amazonia biomes has been showed how key strategy of Low Carbon Agriculture Plan (BRASIL, 2012). However, in 2012, N₂O emissions of Brazilian Agriculture Sector were 541.2 Gg been 43% of direct emissions from pasture animal sector (BRASIL, 2013). The objective in this research is comparing the effect of nitrogen fertilization in the N₂O emissions pasture management system under different densities of babassu palms.

Material and Methods

The experiment was installed in area of Campus IFMA, municipality of Codo, Maranhao State, coordinated Latitude 4° 29' 20" S and Longitude 43° 56' 0" W no period from March to July 2014. Total area of 12 hectares of Neossolo Quartzarenic under Mombasa grass divided into twenty-four plots been 0.5 hectare each. This research had two treatments: pasture management system with low density of babassu palms and pasture management system with high density of babassu palms, beside an area of twenty hectares with babassu forest as reference area. The methodology of field work was based on PECUS Network protocols like this for characterization of soil carbon stocks (Fernandes et. al. 2012) and for measuring gases fluxes Greenhouse soil (Zanatta et . al . 2014). DNDC model was applied for predicting the N₂O emissions (UNIVERSITY, 2012)

Results and Conclusions

The evaluation the daily N₂O emissions in two steps (May/5/2014 and June/15/2014) indicated there is a tendency for decreasing the emissions in rainfall due the end of rainy season in both pasture management systems, see Table 1.

Table 1 Daily N₂O fluxes in pasture management systems under different densities of babassu palms

Treatments	Day	Daily N ₂ O fluxes (g N ha ⁻¹ day ⁻¹)	
		N measured	N predicted
Pasture management system with low density of babassu palms	133	3,77	174
Pasture management system with high density of babassu palms	133	8,18	189
Babassu forest	133	-0,03	1
Pasture management system with low density of babassu palms	167	3,08	100
Pasture management system with high density of babassu palms	167	6,33	103
Babassu forest	167	0,00	1

Pasture management systems based absence N mineral fertilization present low N₂O emissions. On other hand, conform was predicted by DNDC model, the application nitrogen fertilization in pasture management system with high density of babassu palms become the annual N₂O emission rate more bigger as management system with low density of babassu palms, see Table 2.

Table 2 Annual N₂O fluxes in pasture management systems under different densities of babassu palms

Treatments	Pasture management system with low density of babassu palms		Pasture management system with high density of babassu palms	
	N ₂ O fluxes (Kg N ha ⁻¹ day ⁻¹)	Annual N ₂ O emission rate (%)	N ₂ O fluxes (Kg N ha ⁻¹ day ⁻¹)	Annual N ₂ O emission rate (%)
Fertilization (360 kg N)	5,03	1,4	6,22	1,73
Fertilization (180 kg N)	3,34	1,9	3,91	2,17
Fertilization (0 kg N)	0,47	0,0	0,28	0,00

Finally, DNDC model was applied for evaluation N₂O emissions of pasture management systems under different densities of babassu palms which over estimated daily N₂O emissions that limited the its capacity to compare measured and modeled data how show the Figure 1.

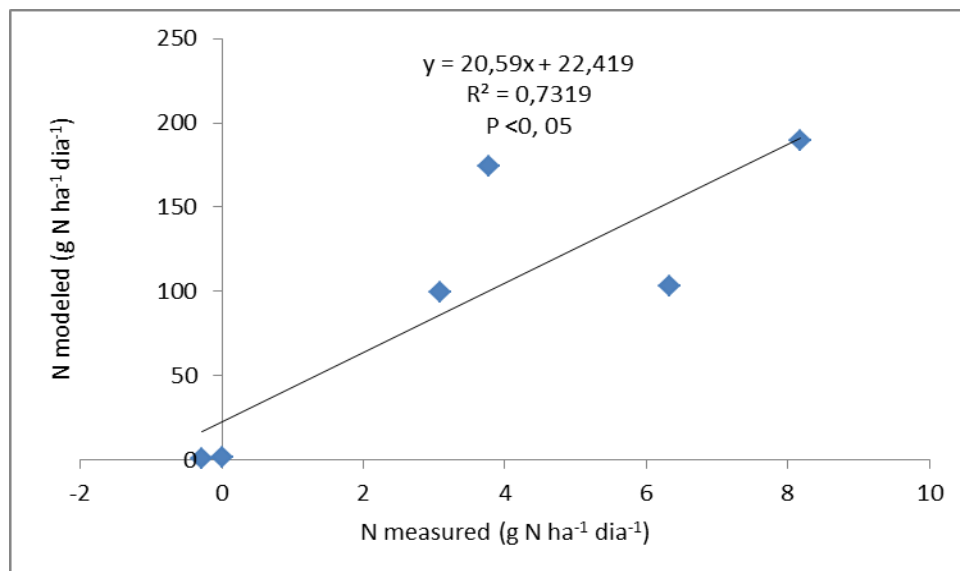


Figure 1 Compare measured and modeled data of N₂O emissions in pasture management systems

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