



## Nitrogen Sources on Growth, Production and Quality of Essential Oil in *Cymbopogon citratus* and *Cymbopogon flexuosus*

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*Cymbopogon citratus* (DC) Stapf and *Cymbopogon flexuosus* (Nees ex Steud.) Will. Watson, (Poaceae) are aromatic plants which produce essential oil rich in citral used in food, pharmaceutical and cosmetic industries. This study aimed to evaluate the effect of nitrogen sources on *C. citratus* and *C. flexuosus* development, essential oil production and the physiological efficiency of nitrogen at 160 and 220 days after planting (DAP). The experiment was carried out at field conditions in a randomized block design comparing the effect of four nitrogen sources (composting of bovine manure, goat manure, poultry manure and urea), with four replications, each one with ten plots and twenty five plants. The results showed that the nitrogen sources did not affect the biomass production and essential oil yield and composition of *C. citratus* for both crops, *C. flexuosus* fertilized with composting bovine manure resulted on decrease of fresh and dry biomass accumulation and essential oil yield at 220 DAP. The increase in essential oil production derived by N fertilization was due to an increase of leaf biomass. *C. flexuosus* produced higher biomass and essential oil yield than *C. citratus* with average between harvests of 3257.5 kg ha<sup>-1</sup> and 29.1 40 kg ha<sup>-1</sup> and 592.9 kg ha<sup>-1</sup> and 11.5 kg ha<sup>-1</sup> respectively. The essential oil content of *C. citratus* was of 17.7 g kg<sup>-1</sup> to 160 DAP and 21.3 g kg<sup>-1</sup> to 220 DAP, 52% higher than to *C. flexuosus* that reached 10.0 g kg<sup>-1</sup> and 8.4 g kg<sup>-1</sup> respectively. The *C. flexuosus* was also more efficient in the use of physiological N in biomass yield than *C. citratus* in both crops. The nitrogen source did not affect the essential oil composition. The major components of the essential oil of *C. citratus* were geranial (39.7 to 42.2%), neral (29.6 to 31.1%), geraniol (4.4 to 5.7%) and  $\beta$ -myrcene (11.7 to 15.2%) while *C. flexuosus* presented geranial (43.6 to 50.7%), neral (29.3 to 34.4%), geraniol (1.6 to 7.5%) and absence of  $\beta$ -myrcene. The citral content in *C. flexuosus* was 10% higher than *C. citratus*.