

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

### Effect of nitrogen fertilization on soil carbon and nitrogen stocks in marandu grassland

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With the intensification of temperature increases is desirable to reduce the concentration of carbon in the atmosphere. Carbon (C) sequestration in soil can be an alternative to mitigate the increases in carbon dioxide concentrations. Pastures has a big potential to sequester C in soil. The objective of this study was to verify changes on soil carbon (CS) and nitrogen stock (NS) in grasslands soils of *Brachiaria brizantha* cv. Marandu fertilized with increasing nitrogen rates. Evaluations were carried out at Forage and Pasture Science Sector of Unesp Jaboticabal in a grassland sowed 15 years ago that is used for beef cattle rearing and finishing. Pasture management was continuous grazing and variable stocking with 25 cm height. Treatments were four nitrogen rates (0, 90, 180 e 270 kg N ha<sup>-1</sup>) applied split in 3 times, from December to march, in completely randomized design with 3 replications (Paddocks). Soil C and N stocks were evaluated in the depths 0-100 cm and 0-5, 5-10, 10-20, 20-40, 40-60, 60-80 e 80-100 cm. Soil samples were analyzed by dry combustion (LECO). Using the soil C and N percentage, the stocks were calculated considering the layer thickness and soil density. The data were submitted to ANOVA and when significant orthogonal polynomial contrasts was run. Nitrogen rates affected CS in the depth of 0-100 cm ( $P<0.05$ ) and 0-5 cm ( $P<0.05$ ). Soil C stock were 92.9, 102.4, 107.9 and 98.1 Mg C ha<sup>-1</sup> for 0, 90, 180 and 270 kg N ha<sup>-1</sup>, respectively. Nitrogen rates effect of CS was quadratic ( $P=0.04$ ). With regards of the depth 0-5 cm, CS were 10.3, 9.2, 10.5 and 9.2 Mg C ha<sup>-1</sup> for 0, 90, 180 and 270 kg N ha<sup>-1</sup>, respectively. For soil nitrogen stocks, nitrogen rates affected the NS in the depths 0-100 and 10-20, 20-40, 40-60, 60-80 and 80-100 cm ( $P<0.05$ ). Total soil N stocks were 3889, 6995, 7101 and 6909 kg N ha<sup>-1</sup> for 0, 90, 180 and 270 kg N ha<sup>-1</sup>, respectively. The effect of nitrogen rates on NS was linear for the depths 10-20, 20-40, 40-60 and 80-100 cm. Increases in soil nitrogen stock in the deep layer augmenting nitrogen rates is probably explained by the increases in root area and mass in the soil.

**Keywords:** grazing management, *Brachiaria brizantha*, carbon sequestration.

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