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Elevated CO₂ atmospheric condition increasing the production of *Brachiaria brizantha* grass

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Increased atmospheric CO₂ is a predictable aspect of climate change and few studies evaluate its effects on grasses used in Brazilian pastures, in which the major part of livestock production is based. We evaluated forage production and chemical composition of *Brachiaria brizantha* under elevated CO₂ atmospheric condition in a FACE facility; the forage was seeded (6 kg ha⁻¹) in plots (5.8 m²) inside each of 12 octagonal rings (10 m diameter), six under ambient conditions (390 µmol mol⁻¹ CO₂; Control) and other six with pure CO₂ flux to achieve a higher target concentration (550 µmol mol⁻¹ CO₂; Elevated CO₂). Aiming soil fertilization, N, P and K were applied (40, 82 and 41 kg ha⁻¹ of N, P₂O₅, and K₂O, respectively) in all plots. Seventy days after seeding, fresh biomass (kg FM ha⁻¹) production was determined by collecting and weighing the total biomass produced above 20 cm height (grazing portion) and then dried in a forced circulation oven (72h at 60 °C) to obtain total dry biomass produced (kg MS ha⁻¹). Samples were grinded (1 mm) and used to determine the content of dry matter (DM), crude protein (CP) and sequential neutral detergent fiber (aNDFom), acid detergent fiber (ADFom) and lignin (LIG). Hemicellulose (HEMI) and cellulose (CEL) were calculated. During the 70 days, the environmental conditions were 23.5 °C of mean temperature, 476 mm of accumulated rainfall and at 61.1 % of the time the CO₂ levels were within the target concentration on the Elevated CO₂ treatment. The biomass production was higher (P<0.05) in Elevated CO₂ treatment than Control, without significant differences (P>0.05) for its chemical composition. These results indicate that under elevated CO₂ atmospheric condition, *Brachiaria brizantha* may have higher forage availability without compromising its fibre composition and the sustainability of a pasture-based livestock production, in terms of forage nutritional components.

Keywords: Climate Change, Elevated CO₂, Pasture, Livestock



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