POTENCIAL PRODUCTION YIELD AND BIOMASS QUALITY ATTRIBUTES OF ELEPHANT GRASS (*Pennisetum purpureum*) FOR ENERGY PURPOSES

POTENCIAL PRODUTIVO E ATRIBUTOS DE QUALIDADE DA BIOMASSA DE CAPIM-ELEFANTE (*Pennisetum purpureum*) PARA FINS ENERGÉTICOS

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Several of the perennial grasses include elephant grass (*Pennisetum purpurem*), energy cane (*Saccharum sp.*), giant reed (*Arundo donax*), sorghum and *Miscanthus* sp. are used for bioenergy production purposes. Elephant grass possesses attributes of an ideal ideotype for large biomass accumulation: tall plant, long and narrow leaves, high tillering and underground stems or rhizomes. Furthermore, this tropical grass has other advantages: (a) begin year-round harvests 6 months after planting, and every 4 months thereafter; (b) high ratoon longevity; (c) consistent fiber quality; (d) adaptation to a wide range of soil types and (e) low flowering rate. This study aimed to evaluate the biomass potential e quality attributes of eighteen elephant grass genotypes for energy purposes. The experiment was carried out in a commercial field at Sumauma Mill in Marechal Deodoro, AL, Brazil. The design was completely randomized, with three replicates. Experiment was established in July 2013 and each plot was composed of three lines of 5 meters (spaced at 1 meter). The genotypes studied were: CNPGL 96-21-1; CNPGL 96-25-3, CNPGL 00-211, BRS Capiaçu, BRS Canará, BAGCE 2, Porto Rico 534-B, Taiwan A-25, Cubano de Pinda, BRS 9279-2, Napier, Cameroon Piracicaba, Vrukwona, T241 Piracicaba, Cuba- 116 e Guaçu and tthe local clones: Cameroon Local e Local 2. Evaluations were made every six months to determinate dry matter yield (Mg ha^{-1} $year^{-1}$), tillering rate (tiller m^{-1}), plant height (m), stem diameter (mm) and contents of acid detergent fiber (ADF), cellulose, lignin and ash (%). All parameters present variations among genotypes. The dry matter yields ranged from 47 to 84,3 Mg ha^{-1} $year^{-1}$. The cultivar BRS Capiaçu shows the higher biomass production with 84,3 ton ha^{-1} $year^{-1}$, following by the cultivar BRS Canará with 72,8 ton ha^{-1} $year^{-1}$. The average rate for tillering was 16.2 stems per meter and the

averages for plant height and stem diameter were 3,33 m and 15,05 mm, respectively. The contents of ADF varies from 34,2 to 40,6%, cellulose from 21 to 31.3%, lignin from 4,6 to 11,6% and ash from 1,5 and 2,1 %. Based in this research, we concluded that elephant grass is a suitable feedstock for energy production, through combustion or for the biofuels. However, an important consideration for this, as well as to the other grasses, is that adequate equipments and facilities for harvesting, drying and storage of the forages are essential.

Keywords: dedicated energy crops, forage grasses, napier grass, fibers, bioenergy.