RESUMO - MELHORAMENTO DE ESPÉCIES PERENES

PRODUCTION OF ENERGETIC BIOMASS FROM ELEPHANT GRASS GENOTYPES FOR BIOGAS GENERATION

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The escalating energy demand in recent decades has caused significant environmental impacts, mainly due to the high dependence on fossil fuels. In response, alternative energy sources have gained prominence as a means to mitigate the challenges associated with non-renewable resources. The use of biomass from specific plant crops represents a sustainable option for energy generation. Elephant grass [Cenchrus purpureus (Schumach.) Morrone] exhibits favorable characteristics for energy utilization, including rapid growth and high biomass production, making it an attractive choice due to its cost-effectiveness compared to other biomass sources. This forage grass can be employed for thermal power generation via direct combustion, biogas production through anaerobic digestion, or biofuel production. Given its broad genetic variability, it is crucial to select genotypes that are best suited for the intended application. The present study aims to evaluate genotypes from Embrapa's elephant grass breeding program focusing on biomass productivity

and biogas production, for energy utilization. Elephant grass biomass (leaves and stems) samples were weighed, chopped, and dried in an oven at 55 ºC for 72 hours. Subsequently, samples were combined with bovine manure inoculum to assess the biochemical biogas potential (BBP) of each genotype. Analysis of variance and mean grouping tests at a 5% significance level were conducted. Significant differences among genotypes were observed for green biomass production, ranging from 189.92 to 232.25 Mg.ha-1. The standout genotypes in terms of biomass production were T_47.1, T_23.2, T_41.2, T_51.5, and BRS Capiaçu. Regarding the BBP results, the T_47.1 genotype showed the highest biogas production volume, reaching 128.30 NL.kgVS-1. According to the results, genotype T_47.1 stood out due to the high biogas and biomass production values, making it a promising choice for bioenergy utilization. Further studies should investigate the energy potential and optimal strategies for utilizing this biomass for energy production, which may include exploring physical, chemical, and enzymatic pretreatments of elephant grass to enhance its energy potential and improve conversion efficiency. Factors such as the age of elephant grass at harvest, addition of other substrates, and optimal co-substrate ratios can also be evaluated to maximize biogas production from anaerobic digestion processes. Acknowledgments: CNPq and Fapemig.