

PRODUCTIVE BEHAVIOR OF BIOMASS SORGHUM HYBRIDS (*Sorghum bicolor*) FOR ENERGY PRODUCTION IN SINOP-MT

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The demand for renewable energy sources is a matter of global concern. The burning of vegetal biomass has becoming an alternative for the production of electricity in thermoelectric. In this context, the cultivation of grasses has tried to attend this demand, because they have a short cycle and simple treatments. Among the grasses cultivated with this purpose, there are different species of the genus *Sorghum Pennisetum* sp., and more recently the biomass sorghum. Biomass sorghum stands out in this scenario, because it is a crop that allows mechanization from sowing to harvesting, is propagated by seed, with ability to produce large amounts of biomass per hectare in a cycle of, approximately, six months. This work aimed to evaluate agronomic characteristics of experimental biomass sorghum hybrids, giving focus those related to energy production, ie, dry matter production (DMP) and superior calorific value (SCV). For this purpose, an experiment was conducted with 14 biomass sorghum hybrids in a randomized block design with three replications. The experimental plot had four rows of 5 m, 0.7 m spaced. Were evaluated: flowering (FLO), plant height (PH), green matter production (GMP), percentage of dry matter (% DM), DMP and SCV. The experiment was carried out at Embrapa Agrossilvipastoral in Sinop-MT. The planting occurred in 11/19/2013, and the harvest happened six months later. The data obtained were applied to analysis of variance and the minimum significant differences between the means were calculated by (DMS-t) t test. Differences were observed among the hybrids for all the characteristics evaluated except to SCV, whose mean value was 4.423kcal kg⁻¹. These results show that exist genetic variability among the hybrids and that is possible to choose those showing the best characteristics. The FLO occurred 113-136 days after planting, ALT ranged from 4.49 to 5.35 m, the PMV 60-111 t ha⁻¹ with MS between 32% and 49% in average. The mean value of DMP was 36 t ha⁻¹, with the most productive genotype reaching the mean value of 47.35 t ha⁻¹. Thus, it is possible to state, that in the experiment, the potential for energy production was 185.17 ha⁻¹ Gcal, and using a conversion rate of 0.001163 kcal KW⁻¹, resulting in a production of 215.35 MW energy. This result is similar to that is found for eucalyptus, that has generally dry matter production of 30 t ha⁻¹ per year and calorific value around 4600 kcal kg⁻¹, generating 138 Gcal ha⁻¹. Based on energy production and studies of cost of production of biomass sorghum, it is possible to conclude that the co-generation of electricity by the burning of biomass sorghum becomes economically viable, without mention to the industrial costs, with sales values above R\$ 15.76 per MW. However, more experiments are necessary, but with proper care, biomass sorghum becomes an interesting and promising alternative for the energy production.