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Productivity of *Eucalyptus brassiana* x *Eucalyptus urophylla* hybrid in different plant spacing, at four year age, in the Chapada of Araripe, Pernambuco, Brazil

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The density of tree species is a very important variable for planning a forest enterprise. It may affect growth rate, plant survival, wood quality, cutting off age, thinning time, management practices and consequently the costs for forestry cropping system. The study aims to assess the effects of different planting spacing in wood productivity of the hybrid *Eucalyptus urophylla* x *E. brassiana* in the Chapada of Araripe. The trial was conducted at the Experimental Station of the Agronomic Institute of Pernambuco (IPA) in Araripina, Pernambuco State, Brazil (Latitude: 7°27'50"S, Longitude: 40°24'38"W, Altitude: 828m). The average annual rainfall in the region is 752.5 mm, concentrated in February, March and April, with average annual temperature of 24°C, evaporation of 1,127 mm.year⁻¹ and relative humidity annual average of 55.2%. Five spacing were used: 1) 3.0 x 2.0m, 2) 3.0 x 2.5m, 3) 3.0 x 3.0m, 4) 3.0 x 3.5m, 5) 3.0 x 4.0m. The experimental design was a randomized blocks with four replications. Before planting, the experimental area was submitted to plowing and harrowing, and sub soiling to 40 cm depth in the row, being incorporated into the soil 2.0 t.ha⁻¹ of lime. 150 g.tree⁻¹ of NPK (06:24:12.) were applied before planting. Each plot consisted of 64 plants, with areas varying from 216 to 432m², totaling 11.520m². As plants were four years old, it was found that mean values for survival (%), height (m), diameter at breast height - DBH (cm), volume of wood (m³.ha⁻¹) and mean annual increment - MAI (m³/ha.ano⁻¹) did not differ statistically among the different plant spacing. Average survival, that was 88%, ranged from 83 to 92% for the spacing 3.0 x 2.5m and 3.0 x 3.5m, respectively. The growth height, which average was 14.8m, was very uniform, varying from 14.2 to 15.0m. The DBH had an overall average of 12.3 cm, which ranged from 11.6 cm at lower plant spacing (2.0 x 2.0m) to 13.4 cm in the largest plant spacing (3.0 x

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4.0m). The volume of wood production in absolute values tended to be greater for smaller spacing (3.0 x 2.0m) with a volume of 116.1 m³.ha⁻¹, equivalent to an average annual increase of 29.0 m³/ha.year⁻¹, while in the wider spacing (3.0 x 4.0m) it was obtained 83.1 m³.ha⁻¹, corresponding to an MAI 20.8 m³/ha.ano⁻¹. It is concluded that the number of plants per area was not enough to increased productivity significantly, suggesting there was little competition between plants until the study period.

Keywords: Planting density, reforestation, energetic forests.