Mixed-species plantations of *Acacia mangium* and *Eucalyptus urograndis* in Southeast Brazil: aboveground biomass, nutrition and soil fertility

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Mixed plantations of *Eucalyptus* genus with trees symbiotically associated with nitrogen fixing bacteria, have been studied in Brazil as a promising management to low fertility soils. To understand the potential benefits provided by *Acacia mangium* (acacia) over the growth and nutrition of *Eucalyptus urograndis* (eucalyptus) were evaluate, at early stage (24 months), mixed and pure stands of both trees species, in Southeast Brazil. The ^{15}N values (Ê) of leaves from acacia and eucalyptus differ significantly suggesting a high contribution from biological nitrogen fixation (BNF) to acacia (49-74%) at the first year, but this contribution decrease at the second year (20-29%). At the first year leaves from eucalyptus under mixed plantation (E100:A100) present the same N content in comparison to eucalyptus fertilized with N (E100+N), while no difference was observed between N content of eucalyptus without nitrogen fertilization (E100-N) and other mixed option (E50:A50). Pure and fertilized treatment of eucalyptus produced aboveground biomass (33 Mg ha^{-1}) at the same level (26.3 Mg ha^{-1}) of mixed treatment (E100:A100), while pure of acacia (10.8Mg ha^{-1}) produced the same quantity of eucalyptus without N fertilization. Soil pH, Ca and Mg (0-10; 10-20 and 40cm) tended to decrease under *A. mangium* influence, while C stocks to increase with time, especially under mixed plantations.

Keywords: biological nitrogen fixation, soil organic matter, biomass, soil fertility