

**TITLE:** ASSOCIATION OF DIFFERENT BACTERIAL LINES INOCULATED IN *Brachiaria ruziziensis* IN VITRO

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**ABSTRACT:**

Brazil is the world's largest beef exporter based on pasture feed. Because of the high cost of chemical fertilizers, interest in bacterial inoculants has been growing because they can promote growth and increase plant productivity in sustainable agriculture. The objective of this work was to identify the effect of the association of different bacterial strains with *Brachiaria ruziziensis* to promote plant growth. For this study, it was evaluated the interaction of the *Brachiaria ruziziensis* pasture with four bacterial strains: *Azospirillum brasilense* (Ab), *Herbaspirillum seropedicae* (Hs), *Burkholderia ambifaria* (Ba) and *Ensifer adherens* (Ea). The experimental design was completely randomized with five treatments, one being the control, and the other inoculated with each of the bacteria. Seed asepsis was performed with acidified hypochlorite, afterward the seeds were transferred to agar/water medium and incubated for 48 hours at 32 ° C in the dark. Pre-germinated seeds were transferred to test tubes containing 25 mL of MS medium and inoculated with  $10^6$  CFU.seed<sup>-1</sup> (Ab, Hs, Ba) and  $10^4$  CFU.seed<sup>-1</sup> (Ea). After 21 days of inoculation, it was evaluated the fresh and dry weight of shoot and root biomass, microbial (epiphytic and endophytic) counts, and microscopic root morphology, with 1% methylene blue. A polymerase chain reaction (PCR) was performed to confirm the presence of epiphytic and endophytic bacteria. The data were submitted to analysis of variance and compared by the Tukey test at a significance level of 5%. As a result, *B. ruziziensis* presented better interaction with Hs, where it showed increase in the length and fresh and dry biomass of the plant, as well as the epi and endophytic bacterial growth of the same, while root microscopy showed root growth in inoculated plants of Hs. Studies show that Hs bacteria has potential as a plant growth promoting bacterium, increasing the productivity of annual crops such as corn and wheat. This work also shows the positive potential of this bacterium in *B. ruziziensis* and can be used as inoculant for this bacterium culture.

**Keywords:** Biofertilizer; Forage; *Herbaspirillum seropedicae*.