

**TITLE:** MAIZE RESPONSE TO INOCULATION OF CO-CULTURED STRAINS BR11366 AND BR11281

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**ABSTRACT:**

Simultaneous cultivation of bacteria is presented as a new proposal of inoculant production using different species of diazotrophic bacteria. The objective of this work was to evaluate the growth of maize plants inoculated with a co-cultivation and immobilized cells of *Paraburkholderia tropica* (strain BR11366) and *Gluconacetobacter diazotrophicus* (strain BR11281) grown simultaneously and immobilized in polymeric vehicle and compared to the individual application of both bacterial strains. The experiment was conducted in a greenhouse using the maize hybrid SHS5050. Seeds were planted in pots containing 2 kg of sterile sand+vermiculite substrate in a completely randomized design with three replicates. Treatments tested were: control (without inoculation), polymeric inoculant containing strain BR11366 and BR11281 and Co-cultivated polymeric mixture. For the Co-culture treatment, pre-inoculum was prepared, followed by the Erlenmeyer growth phase of 50 mL of a medium specific for each strain and incubated for 24 h for BR11281 and 14 h for BR11366. The cultures were mixed and again agitated for another 24 h. At the end, 50 mL of the simultaneous culture was mixed with 50 mL of pre-sterilized polymer. The inoculation was done by seed cover. At 17 days after planting, dry weight and root architecture were measured and this parameter used the WinRhizo Pro™ software. The Co-cultivation treatment increased shoot dry weight higher than the individual treatments of BR11281, BR11366 and control, respectively, by 19%, 14% and 30%. Also, Co-cultivation improved root dry weight by 15%, 24% and 45% higher than the same treatments, respectively. Root architecture was also modified by the Co-cultivation treatment showing higher length, projected area, area surface, length /volume ratio and root volume than the other treatments. It can be concluded that simultaneous cultivation of the mentioned strains besides reducing the number of processes necessary for the production of the inoculant can improve the responses of the maize plants to the inoculation.

**Keywords:** Diazotrophic bacteria; Inoculation; Co-cultivation

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