

**TITLE:** CO-INOCULATION WITH SELECTED *BACILLUS* P-SOLUBILIZING AND *AZOSPIRILLUM* AFFECTS MAIZE ROOT GROWTH

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**ABSTRACT:** Bacteria that promote plant growth and improve crop yield and quality are critical to sustainable agriculture. The microbial inoculants are mainly composed by microorganisms capable to promote plant growth through several mechanisms, including root growth. However, their use in agriculture as inoculants and the effect of two or more strains of promoting bacteria combined on plant growth is still limited. The objective of this work was to analyze the effect of co-inoculation of *Bacillus* phosphorus solubilizing microorganisms (MSP) and *Azospirillum* (AZO) on maize plants grown in nutrient solution. Four strains of bacteria belonging to the collection of multifunctional and phytopathogenic microorganisms of Embrapa Milho e Sorgo and their combination (MSP1, MSP2, AZO1, AZO2, MSP1xAZO1, MSP1xAZO2, MSP2xAZO1 and MSP2xAZO2) were grown in LB medium, resuspended in 0.85% (w/v) NaCl to a final concentration of  $10^7$  colony-forming units (cfu)/ml and used for plant inoculation. Maize seeds were germinated for four days and grown in a floating system for seven days with ½ Hoagland's nutrient solution. After the acclimatization period, the maize roots were incubated with the bacteria solution for six hours and then transferred to the nutrient solution for ten more days. The maize roots were photographed and the root traits were analyzed and quantified with RootReader2D and WhinRhizo softwares. The root and shoot were dried at 65 °C until constant weight. One combination of MSP and Azo improved significantly root growth and all treatments showed positive effects on maize root morphology and shoot and root dry weight, indicating potential microorganisms and co-inoculations to be further used as inoculants.

**Keywords:** P-solubilizing, nitrogen fixing, microorganisms, root surface

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