

**Title: PHYSIOLOGICAL ASSESSMENT OF COTTON SEEDS SUBJECT TO APPLICATION OF HUMIC ACID AND AZOSPIRILLUM BRASILENSE**

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**Summary:**

It is fundamental and important for the agricultural sustainability the development of technologies aimed at increasing the efficiency of nitrogen fertilizers, as well as aimed at maximizing profits. The use of nitrogen-fixing bacteria has been tested in various cultures, as well as humic substances, which are capable of improving the environment used by the seeds. However, from the time the germination of the seeds starts, there is little knowledge about the effects of these substances. Thus, this work aimed to evaluate the effect of inoculation of cotton seeds with *Azospirillum brasilense* in the presence and absence of humic substances applied via seeds on germination, force of seedlings, the speed and the initial growth of the cotton plant. The experimental design was completely randomized with four replicates. The treatments were formed in the presence and absence of humic acid and six doses of liquid inoculant for grass (Masterfix ® grasses), containing *Azospirillum brasilense*, being used doses of 0; 3,33; 6,66; 9,99; 13,32 and 16,65 mL kg<sup>-1</sup>. The use of humic acid provided greater lengths as much of the root as the total length of the plant, when associated to the absence and to the smallest doses of *A. brasilense* (3,33 and 6,66 mL kg<sup>-1</sup>). The same occurred for the mass of the the dry matter of the shoot, root and total, only in the absence of humic acid and with dose of 3,33 mL kg<sup>-1</sup> of *A. brasilense*. Increasing the doses of *A. brasilense* fostered the accumulation of dry matter mass of the shoot, root and total, when in the absence of humic acid. When associated with the humic acid, there was a reduction in the accumulation of dry matter mass. *A. brasilense* doses didn't affect the germination percentage and germination speed index. However, the use of humic acid led to a greater length of the shoot and to the reduction of the percentage of germination. It was concluded that the plant growth parameters were favored by the interaction of humic acid, with the absence or low doses of *A. brasilense*. They also were harmed as the doses increased. There was a decrease in the rate of seed germination with the application of humic acid.

**Key words:** *Gossypium hirsutum*, diazotrophic bacteria, seed germination