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Thematic area: pastures and forage

Use of L-tryptophan on bacterial strains that promote plant growth inoculated in BRS Capiaçú seedlings

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Plant growth-promoting bacteria have emerged as sustainable alternatives to the use of chemicals in agricultural production. Among their main benefits is the ability to synthesize phytohormones of the auxin classes, such as indole-3-acetic acid, using its precursor, the amino acid L-tryptophan. This auxin plays an important role in root development, cell division, elongation, and differentiation, seed germination, xylem development, flowering, and fruiting. There are still few studies on the treatment of bacterial inoculants for plant growth promotion. Thus, this study aimed to evaluate the effects of including different concentrations of L-tryptophan in plant growth-promoting bacterial strains for inoculation in elephant grass stems, *Pennisetum purpureum* (Schumach), BRS Capiaçú variety. The experiment was conducted in a completely randomized design, in a nine by four factorial scheme, with nine bacterial strains with potential for plant growth promotion, cultivated in a nutrient-rich medium supplemented with four concentrations of L-tryptophan (0, 5, 10, and 15 mmol). Each treatment had three replicates, each containing 10 seedlings. The seedlings were represented by a lateral bud/node with 3 cm of internode on each side. Evaluations were performed on the 21st day after stem inoculations; during this period, the stems were kept in a germination chamber at 25 ± 5 °C, under a 12-hour photoperiod. Data were subjected to analysis of variance, and means were compared using the Scott-Knott test at a 5% probability level. Root length, shoot length, and fresh and dry weight of the seedlings were evaluated. For root length, the 15 mmol concentration showed results 18.5% higher than the average of the other treatments. For shoot length and fresh seedling weight, the 5 and 10 mmol concentrations performed better, with values over 30% above average. For dry seedling weight, the different concentrations did not show statistically significant results. The strains that showed the best performance across the different treatments were *Rhizobium cauense* strain (code UAGB150), *Sinomonas atrocyanea* strain (code UAGB71), and *Burkholderia territorii* strain (code UAGB105). These results indicate that the incorporation of L-tryptophan into bacterial culture media possibly promoted the synthesis of auxin class phytohormones, resulting in a greater increase in root size, shoot length, and fresh weight of BRS Capiaçú plants.

Keywords: biotechnology, bacteria-plant interaction, forage.

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