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Field of Study: Forage Science

Use of plant growth-promoting bacteria in forage farming: a bio-input alternative for Pennisetum purpureum Schumach seedlings cultivar BRS capiaçu.

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The productive capacity of a pasture is directly related to the uniformity and full germination of seeds and seedlings, which have a major impact on the initial formation and management of the pasture. In order to achieve these criteria, plant growth-promoting microorganisms play an important role, given their potential to act in the production of phytohormones, nutrient cycling, and their interactions with plants are the basis for the development of bioproducts, which are a viable alternative for improving the initial development of pastures. The aim was to evaluate the germination and morphological characteristics of BRS capiaçu seedlings after inoculation with plant growth-promoting bacteria. The experiment was carried out in a completely randomized design, with two evaluations, on the 11th and 25th day after inoculation. Ten treatments were evaluated: seven bacterial inoculants, two commercial inoculants (Biomais® and Biomaphos®), and a control without inoculation. During inoculation, the seedlings were immersed in the inoculum for 30 minutes under gentle manual agitation; for the commercial inoculants, the seedlings were inoculated according to the manufacturer's recommendations. In the control treatment, the seedlings were immersed in a buffer solution for 30 minutes under gentle manual agitation. Germinated seedlings were counted daily, starting on the 3rd day after inoculation and ending on the 10th day. On the 25th day, the concentration of chlorophyll a and b was assessed by measuring the middle third of the first seedling, using the SPAD-502 chlorophyll meter (Soil Plant Analysis Development); the number of roots, counting the roots coming out of the node of the thatch; and the length of the largest root. In the statistical analyses, the differences between the groups were compared using the t-test at 5 and 1% probability for the variables collected in both evaluations. Next, the means of all the treatments per variable on the 11th and 25th day after inoculation were compared with the control using the Dunnett test at 5%. The bacterial inoculations were responsible for the greatest increases during the evaluations, with Sinomonas atrocyanea DSM 20127 standing out for its 84% increase over the control in the germination speed index on the 11th day and 129% for root length on the 25th day, Enterobacter kobei CIP 105566 which promoted the greatest increases in relation to the control treatment, with 666% and 211%, for chlorophyll a and b levels respectively, on the 25th day of evaluation and Klebisiella variicola F2R9 which stood out at both evaluation times and provided the greatest increase in relation to the control treatment, 86% in the root number variable. Thus, this study represents a promising and sustainable strategy for the efficient establishment of pastures, through rapid germination and better plant development.

Keywords: forage, Inoculants, nutrients, microorganisms.

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