

The use of bacterial consortia improves seed tuber production in potato varieties for frying

Rodrigo Mauricio Ramírez ¹, Pedro Rodriguez-Grados ², Jean Piere Quiliche ³, Sergio Contreras-Liza ^{1,*}, José Montemayor Mantilla ¹, Edison Palomares Anselmo¹,

Abstract

Objective: To determine the effect of a consortium of growth-promoting rhizobacteria on potato varieties for frying under controlled conditions. *Methodology:* The research was conducted at the Universidad Nacional José Faustino Sánchez Carrión, Huacho, Peru. The experiment was carried out in pots in a greenhouse using a completely randomized design with 6 replications, under a factorial arrangement. Four potato genotypes for frying (cv. Bicentenario, advanced clones UH-9, CIP 396311.1, CIP 399101.1) and four inoculant treatments were used, *Azotobacter* sp. (T1), *Azotobacter* sp.+ *Bacillus simplex* (T2), *Azotobacter* sp.+ *B. subtilis* (T3), *Azotobacter* sp.+ *B. subtilis*+ *B. simplex* (T4) and an uninoculated control (T0). The variables studied were vegetative vigor, plant height, number of stems per plant, number of leaves per plant, fresh and dry weight per plant, tuber diameter, and number and weight of tubers per plant. Data were statistically processed and analysed by performing Scott-Knott's comparison of treatments and using principal component analysis. *Results:* The inoculation alone with *Azotobacter* sp. (T1) or with the consortium *Azotobacter* sp.+ *B. simplex*+ *B. subtilis* (T4) significantly promoted potato growth with respect to the number of stems and number of leaves per plant, as well as weight and number of tubers per plant; for vegetative vigor, the control treatment (T0) obtained differences in comparison with the inoculated treatments. Plant height, number of shoots, fresh and dry weight of foliage and tuber diameter did not show significant differences due to the effect of the inoculation. Interactions between varieties and treatments were found for vegetative vigor, the number of leaves and tubers per plant, being positive for the inoculation with some bacterial consortia. *Conclusion:* Bacterial consortia with *Azotobacter* sp. promote the growth and productivity of potato varieties for processing under greenhouse conditions.

Keywords: Consortium, rhizobacteria, potato clones, inoculation, plant-microbe interaction, greenhouse.