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Bean nutrition and development in the function of reduced phosphorus doses and inoculation with arbuscular mycorrhizal fungus

Fernando de Souza Buzo
,
Emariane Satin Mortinho
,
Thais Lana Lobo Santana
,
Izabela Militão Garcia
,
Caroline Lopes Monteiro de Carvalho
&
Marcelo Carvalho Minhoto Teixeira Filho

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Abstract

It is widely accepted that mycorrhizal fungi increase phosphate fertilization efficiency. The objective of this study was to evaluate the effects of reduced phosphorus applications and inoculation with arbuscular mycorrhizal fungi (AMF) on the nutrition and initial growth of the carioca-type common bean (*Phaseolus vulgaris* L). The study was conducted at the Faculty of Engineering of Ilha Solteira, in the city of Ilha Solteira/SP, Brazil, where there was temperature and humidity monitoring as well as irrigation control. The experimental design was randomized blocks with a 5 × 2 factorial scheme and four replications. The

treatments consisted of a combination of five doses of P_2O_5 (0%, 25%, 50%, 75%, and 100% of the recommended dose for beans) applied during sowing, with or without inoculation with AMF - *Rhizophagus intraradices* - at 200 g ha^{-1}. The root volume, root dry matter, dry mass of the aerial part, and the concentration and accumulation of macro- and micronutrients in the aerial part were evaluated. Inoculation with AMF enhanced the root system, growth of the aerial part, and absorption of most nutrients, resulting in greater nutrient accumulation and increased phosphorus absorption. The combined inoculation and phosphate treatments increased the concentration and accumulation of nutrients in common beans.