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Effect of Phosphate and Zinc Biofertilizers on Seed Yield and Molar Ratio of Phytic Acid to Zinc in Two Cultivars of Bean (Phaseolus vulgaris L.)

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Abstract : In order to evaluate the effect of phosphate and Zn bio-fertilizers on the yield, phytic acid (PA), Zn concentration and PA/Zn molar ratio in bean, a field experiment was carried out for two years. The treatments included two cultivars of bean (Talash and Sadri), four levels of P (P₀, P₁: 100 kg ha⁻¹ triple super phosphate (TSP), P2: 50 kg ha⁻¹ TSP + phosphate bio-fertilizer, P₃: phosphate bio-fertilizer), three levels of Zn (Zn₀, Zn₁: 50 kg ha⁻¹ ZnSO4, Zn₂: Zn bio-fertilizer). Phosphate bio-fertilizer consisted of inoculum of mycorrhizal fungus and Azotobacter and Zn bio-fertilizer consisted of Pseudomonas bacteria. The results revealed that there was significant difference between yield and Zn concentration between years. The effect of cultivar was significant on studied parameters. The lowest content of PA and PA/Zn were obtained from Talash. P treatment caused to significant difference on parameters in which P₂ caused to increase yield, P and Zn concentration, and decrease PA and PA/Zn by 21.8%, 38.2%, 33.4%, 17.4% and 38.6% respectively. Zn treatment caused to significant difference on studied parameters. The maximum number of parameters were obtained from Zn₁ and Zn₂. The higher Zn concentration led to lower content of PA and PA/Zn. Using of P and Zn bio–fertilizers were caused to increasing nutrient uptake, improving growth condition and reducing PA and PA/Zn molar ratio.

Keywords : mycorrhizae, phosphorus, pseudomonas, zinc
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