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How Does Vicia faba-rhizobia Symbiosis Improve Its Performance under Low Phosphorus Availability?

Authors : B. Makoudi, R. Ghanimi, M. Mouradi, A. Kabbadj, M. Farissi, J. J. Drevon, C. Ghoulam

Abstract : This work focuses on the responses of Vicia fabarhizobia symbiosis to phosphorus deficiency and their contribution to tolerate this constraint. The study was carried out on four faba bean varieties, Aguadulce, Alfia, Luz Otono, and Reina Mora submitted to two phosphorus treatments, deficient and sufficient and cultivated under field and greenhouse hydroaeroponic culture. Plants were harvested at flowering stage for growth, nodulation and phosphorus content assessment. Phosphatases in nodules and rhizospheric soil were analyzed. The impact of phosphorus deficiency on yield component was assessed at maturity stage. Under field conditions, phosphorus deficiency affected negatively nodule biomass and nodule phosphorus content with Alfia and Reina Mora showing the highest biomass reduction. The phosphatase activities in nodules and rhizospheric soil were increased under phosphorus deficiency. At maturity stage, under soil low available phosphorus, the pods number and 100 seeds weight were reduced. The genotypic variation was evident for almost all tested parameters.

Keywords : faba bean, phosphorus, rhizobia, yield
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