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Effect of Inoculation with Phosphate and Potassium Dissolving Bacteria on Growth, Yield, and Seed Quality of Pea (*Pisum Sativum* L.)

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TWO FIELD experiments were conducted during winter seasons of 2006/2007 and 2007/2008 at Kaha (Kalyiobia Governorate) Horticulture Research Station, Egypt. The present investigation was initiated to study the effect of two types of bio-fertilizers *i.e.*, Phosphorin and Potassiumag (used as phosphorus and potassium releasing bacteria, respectively) when applied along with different rates of mineral phosphorus and potassium on vegetative growth, yield, yield components and seed quality of pea plants. This work aims to find out the appropriate application of P and K fertilizers with bio-fertilizers to minimize the abuse of chemicals on the environment. All the studied traits of seed yield and its components were affected by the fertilization treatments except of pod length and no. of seeds / pod in both seasons. Generally, it was found that effect of fertilization treatments on vegetative growth, yield, yield components and seed quality differed as fertilizer levels differ. The inoculation of pea seeds with both bio-fertilizers; phosphorin and potassiumag and application of P and K mineral fertilizers at 30 kg P_2O_5/fed and 34 kg K/fed (⅔ of the recommended dose), was found to be the best fertilization treatment respectively. This treatment surpassed the other fertilization treatments for the most studied traits of vegetative growth, yield, yield components and seed quality of pea plants in both seasons. Therefore, it could save ⅓ of the recommended dose of P and K mineral fertilizers (about 15 Kg P_2O_5/fed and 17 kg K/fed) by using the bio-fertilizers; phosphorin and potassiumag.

The application of biofertilizers to the cereal and legume plants has been a subject for comprehensive discussions and studies in the recent years. This is mainly due to increased prices of mineral fertilizers which also considered injurious to the environment. These findings revived the interests of microbiologists for manipulating phosphorus and potassium (silicate) dissolving and/ or releasing bacteria to enhance their uptake by plants. These microorganisms are known to play an essential role in mobilizing nutrients (fertilizers) from non-available sources and hence reduce the application of mineral fertilizers. To achieve these benefits, there is a need for more field trials to gain the desired impact of biofertilizer application. In this investigation, we selected pea as a module plant to emphasis the positive effect of biofertilizers