

# Effects of phosphorus fertilization rate and *Pseudomonas fluorescens* strain on field pea (*Pisum sativum* subsp. *arvense* (L.) Asch.) growth and yield

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**ABSTRACT** A field experiment was conducted at Rezvanshahr, Guilan province, Iran, to evaluate the effects of phosphorus fertilizer rate and *Pseudomonas fluorescens* strains on growth and yield of field pea (*Pisum sativum* L.). The experimental design was a randomized complete block in a factorial arrangement with three replicates. Factors were phosphorus fertilizer rates (0, 25, 50, 75, and 100 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup> as triple superphosphate), and seed inoculation with *P. fluorescens* strains [control (non-inoculated), inoculated with strain R41, and strain R187). Analysis of variance showed that plant height, seed yield, pod number per m<sup>2</sup>, 100-seed weight, biological yield, harvest index, and leaf P concentration were significantly influenced by phosphorus fertilizer rate and *P. fluorescens* strain. At the same time, phosphorus fertilizer rate × *P. fluorescens* strain interaction was significant only for 100-seed weight and leaf P concentration. On the other hand, seed number per pod was significantly affected neither by phosphorus fertilizer rate nor by pseudomonas strains. Result showed that seed yield was significantly increased  $1099 \pm 67$  to  $1898 \pm 118$  kg ha<sup>-1</sup> as P<sub>2</sub>O<sub>5</sub> application rate increased 0 to 75 kg ha<sup>-1</sup>, and thereafter relatively remained constant. There was no significant difference in seed yield between plants raised inoculated seeds with *P. fluorescens*, strain R187 ( $1664 \pm 97$  kg ha<sup>-1</sup>) and those raised inoculated seeds with *P. fluorescens*, strain R41 ( $1669 \pm 104$  kg ha<sup>-1</sup>). At the same time, plants raised inoculated seeds with *P. fluorescens* (both strains) produced greater grain yield compared to those raised uninoculated seeds ( $1370 \pm 80$  kg ha<sup>-1</sup>). Based on the results of this study, P<sub>2</sub>O<sub>5</sub> application at the rate of 75 kg ha<sup>-1</sup> and inoculation with pseudomonas bacteria are recommended for obtaining the greatest

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**seed yield in field pea. Keywords: phosphorus, plant growth-promoting rhizobacteria, Pisum sativum**

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