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## *Rhizobium* and Mycorrhiza Inoculation Affect Yield Components in *Pisum sativum*

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### Abstract

In sustainable agriculture, *Pisum sativum* L. has a major environmental role to play through atmospheric nitrogen fixation. This legume crop can also form a mutualistic relationship with arbuscular mycorrhiza fungi to increase its phosphorus uptake. So far an important aim for most pea researchers is the increase of yield through breeding and the extension of the production areas. The importance of integrated agronomic practices such as microbial inoculations has received less attention. The purpose of this investigation was to evaluate the effects of double and/or single inoculation of *R. leguminosarum* bv. *viciae* and the mycorrhizal fungus *G. mosseae* on yield components of field pea. Our results indicate that there were significant differences ( $p < 0.05$ ) in nodulation, mycorrhizal root colonisation, plant height, node number, internode length, leaf area and shoot dry matter yield of *Pisum sativum*. However, there were no statistically significant differences between the groups in root biomass production. The poorest results were obtained with the control group as compared to *Rhizobium* and/or mycorrhiza inoculants, and dual nitrogen and phosphorus (N and P) application. *Rhizobium* alone gave the best and similar results to the N and P group, whereas the co-inoculated treatment (mycorrhiza and rhizobia) did not show maximum synergetic effect on each yield components of field pea, although its plant height and leaf area were found to be statistically similar to the chemical fertiliser and other single microbial treatments. That might be resulted from their competition for space and resources such as carbon in the root system. The overall results demonstrate that similar increases in field pea yield components with rhizobia and mycorrhiza inoculation could lead to reduce or replace N and P fertiliser requirements. That might be particularly vital for the resource poor farmers and environmentally-friendly farming practices to increase field pea production under low soil fertility conditions but this needs to be verified by field trials.

**Keywords:** Mycorrhiza, *Pisum sativum*, *Rhizobium*, yield components