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## Summary

The present investigation was carried out under laboratory and field conditions to study the effect of dual inoculation with AM fungi and *Rhizobium leguminosarum* on the growth of faba bean in the presence of compost under low level of N and P fertilizers (50 and 33.3 % respectively). The results might be summarized as follows:

1- *Rhizobium leguminosarum* was isolated and identified from faba bean plant roots. AM fungi were isolated and identified from rhizospheric soil.

2- Shoot length and shoot dry weight at 60, 90 and 120 days from sowing were studied. The application of 50% nitrogen, 33.3% phosphorus and 100% potassium of the recommended dose along with AM-fungi, *Rhizobium leguminosarium* inoculants and compost resulted in a significance increase in shoot length and shoot dry weight at 60, 90 and 120 days from sowing compared to the control (full NPK).

3- Studying some growth parameters showed that the number of branches, number of pods, weight of the seeds and total yield were significantly increased with the dual inoculation of *Rhizobium leguminosarum* and AM fungi along with compost under low phosphorus and nitrogen contents.

4- Studying some root parameters showed a markedly significant increase in nodules number. The dual inoculation of *Rhizobium leguminosarum* and AM fungi along with compost under low phosphorus and nitrogen contents was a superior for the mean of nodules number and nodules dry weight after 60, 90 and 120 days from sowing.

5- Severity of mycorrhizal colonization was studied. The highest values was recorded by the application of AMF, *Rhizobiumleguminosarum*, compost, 33.3 %

phosphorus, 50 % nitrogen and 100% potassium at 60, 90 and 120 days from planting.

6- Enzymes activities were also investigated. Concerning to nitrogenase and dehydrogenase activities, the most effective treatment after 60, 90 and 120 days of planting was that inoculated with both *Rhizobium leguminosarum* and AM fungi along with compost under low phosphorus and nitrogen contents.

7- Estimation of NPK contents in faba bean plants were determined. Data pointed out that the application of 50% nitrogen, 33.3% phosphorus and 100% potassium of the recommended dose along with AM-fungi, *Rhizobium leguminosarium* inoculants and compost led to the highest percent of total nitrogen, total phosphorus and total potassium at the three intervals 60, 90 and 120 days. It was evident that the total phosphorus percent increased after 90 days from planting, while it decreased after 120 days among all treatments. While, there was a decrease in potassium percent on plant aging along all treatments.

8- Studying some physiological parameters showed that there was a significant increase in chlorophyll (a), chlorophyll (b) and carotenoids contents of faba bean leaves after 90 and 120 days of sowing.

9- Regarding total nitrogen percent and crude protein in the seeds, there was no significant differences among treatments.