

5. SUMMARY

Two field experiments were conducted through 1991/1992 and 1992/1993 years at Sids Agricultural Research Station to study the interaction between mineral and biofertilizers on growth, yield and biocontents.

Therefore, sets of field experiments were carried out using cereal crop (wheat) and legumes crop (soybean) as indicator plants.

Wheat plants were individually inoculated with either *Azotobacter sp* or *Azospirillum sp*, while legumes (soybean) were individually inoculated with either phosphorine or *V.A. Mycorrhizal*.

The obtained results and conclusions can be summarized as follows:

A. Cereal crops (wheat):

1. The application of the mineral fertilizer at 75% of the recommended rate with 50 g/Fed *Azotobacter sp* or 50 g/Fed *Azospirillum sp* yielded, similar or even higher in plant height, number of tillers, dry weight, spike length, number of spikelets, number of grains per spike, weight of grain per spike, weight of 1000 grains, grain yield and straw yield than that yielded upon fertilization with the mineral fertilizer.
2. The inoculation of the rhizosphere with either *Azotobacter sp* or *Azospirillum sp* at rate of 50 g/Fed accompanied with fertilization with inorganic nitrogen at 75% of its recommended field rate led to the highest concentrations of N, P and K in wheat plants.
3. The obtained results of plant uptake of N, P and K at both stages of growth (45 and 100 days of planting) indicated that a significant increment had been occurred by fertilizing the plant with inoculation of the rhizosphere with either *Azotobacter sp* or *Azospirillum sp* at rate of 50

g/Fed accompanied with fertilization with inorganic nitrogen at 75% of its recommended field rate.

4. The obtained data of wheat grain and straw uptake of N,P and K illustrated that a significant of N, P and K uptake with 75% of the recommended rate of the inorganic nitrogen combined with inoculation with 50 g/Fed of either *Azotobacter sp* or *Azospirillum sp*.
5. The obtained data indicated that the treatments of (56.25 kg N/Fed + 50 g/Fed *Azotobacter*) and (56.25 kg N/Fed + 50 g/Fed *Azospirillum*) caused the highest protein value while this treatment caused the lowest value of total carbohydrates and starch content.
6. Results of the follow-up of the soil contents of total nitrogen, available P and K may be due to the different fertilization treatments. Data revealed that in both seasons of cultivation soil contents of the three fertilizer elements were highest upon fertilizing the soil with urea at 75% of its field recommended level) combined with 50 g/Fed of *Azotobacter sp* or *Azospirillum sp* inoculated at the plant rhizosphere.

B. Leguminasease (Soybean):

1. The application of the mineral fertilizer at 16.5 kg P₂O₅/Fed super phosphate with 50 g/Fed phosphorine or 50 g/Fed *VA-Mycorrhizal* yielded plant height, number of tillers, dry weight, number of bods per plant, number of seed per plant, weight of seed per plants, weight of 1000 seeds, soybean yield and straw yield, almost similar or even higher than that yield upon fertilization with the mineral fertilizer.

2. The inoculation of the rhizosphere with either phosphorine or *VA. Mycorrhizal* at rate of 50 g/Fed accompanied with fertilization with super phosphate at 75% of its recommended field rate caused the highest concentrations of N, P and K.
3. The obtained results of plant uptake of N, P and K at both stage of growth (45 and 75 days of planting) indicated that a significant increment had been occurred by fertilizing the plant with inoculation of the rhizosphere with either phosphorine or *VA. Mycorrhizal* at rate of 50/Fed accompanied with fertilization with super phosphate at 75% of its recommended field rate.
4. The obtained data of soybean grain and straw uptake of N, P and K indicated that the a significant increase of N, P and K uptake with 75% of the recommended rate of the super phosphate combined with inoculation with 50 g/Fed of either phosphorine or *VA-Mycorrhizal*.
5. The obtained data indicated that the treatments of (16.5 kg P₂O₅/Fed + 50 g/Fed phosphorine) and (kg P₂O₅/Fed + 50 g/Fed *VA-Mycorrhiza*) caused the highest protein and oil value while this treatment caused the lowest value of total carbohydrates.
6. The interaction effect of biofertilizers and mineral fertilizers on the fatty acid composition on soybean crude fat has been studied. The obtained results indicated that all analyzed fat samples had a low content of saturated fatty acids (12.6-18.54%) while the unsaturated fatty acids comprised 84.41-87.36%.
7. The interaction comprised effect of biofertilizers and mineral fertilizers on SDS-PAGE patterns of soybean proteins has been investigated. The obtained results revealed that no differences for each protein in soybean treatment.

8. Results of the follow up of the soil contents of total nitrogen, available P and K is due to the different fertilization treatments. Sata revealed that in both seasons of cultivation soil contents of the three fertilizer elements were highest upon fertilizing the soil with super phosphate (at 75% of its field recommended level) combined with 50 g/Fed of phosphorine or *VA-Mycorrhizal* inoculated at the plant rhizosphere.