SUMMARY

Leguminous crops are considered one of the important crops in the A.R.E and all over the world. Its importance comes from the high value and level of protein found in the seed which used for human and animal consumption. Unfortunately, leguminous crops are subjected to suffer from serious diseases which affect the quality and quantity of total seed preduction. The diseases caused by several soil organisms, so, several studies were done to control these diseases. Biological control of soil-borne plant pathogens has recently received a considerable attention. However, there is still a problem in the application of biocontral agents on a large scale under field conditions. So, this study aims to contribution in Knowing the role that may be played by biological control to solve several ecological problems. induced by chemical fungicides. Results could be summarized in the following :

1 - Some of the pathogenic fungi could be isolated from leguminous diseased plants, these isolated fungi were Rhizoctonia solani, Seclerotinia sclerotiorum, Macrophomina phaseolina, Trichothecium roseum, Trichoderma spp, Fusarium solani, and Fusarium spp.

Also, there were isolated fungi from broad bean seed samples as follows:- Alternaria spp, Aspergillus sp,curvularia sp, Epicoccum sp, Fusarium sp, Gliocladium sp, Nigrospora spp, Phoma sp Rhizoctonia solani and Stemphylium sp.

On the other hand, the isolated fungi from chickpea seed samples were, Bipolaris sp, Diplococcum sp, Drechslera sp, Epicoccum sp, Fusarium sp, Gliocldium sp, and Nigrospora sp, Whereas the isolated fungi from lentil seed sampls were, Aspergillus sp, and Penicillium sp.

Isolated fungi from lupine seed samples were, Alternaria sp, Aspergillus sp and Ulocladium sp.

2 - Pathogenicity tests of some selected fungi i.e. an isolate of Sclerotinia sclerotiorum, Sclerotium rolfsii, Trichothecium roseum, Macrophomina phaseolina and Fusarium moniliforme were carried out under greenhouse conditions using sterilized and natural soils in pots (15 cm). Legume crops (i.e. chickpea cv Giza 2), broad bean (cvs Giza 402 and Giza 2), lentil (cv Giza 370) and lupine (cv Giza 2). Generally, all tested fungi were pathogenic to the mentioned crops but the percentage of infection varied for the different crops. This may be due to the variability in responsc of crop species to the pathogen.

As for chickpea, T. roseum showed the least percentage of healthy survival plants followed by the mixture of pathogenic fungi. As for broad bean, the least percentage of healthy survival plants were obtained in case of Sclerotinia sclerotiorum and Sclerotium rolfsii followed by T. roseum. On the other hand, Sclerotinia sclerotiorum and Scl. rolfsii showed the least percentage of healthy survival plants of lentil.

As for, lupine S. sclerotiorum and the mixture of the pathogenic fungi showed the least percentage of healthy survival plants. On the other hand, multiple of all pathogenic fungi were much pathogenic on lentil and broad bean which increased the pre and post emergence damping off for them while decreased the percentage of survival plants for broad bean and chickpea.

3 - Trichoderma harzianum inhibited and overgrew T. roseum, S. sclerotiorum and Scl. rolfsii, whereas B. subtilis only or Streptomyces inhibited the growth of the tested pathogens i,e Scl. rolfsii, S. sclerotiorum and T. roseum. The greatest inhibitory was observed in case of B. subtilis on S. sclerotiorum followed by T. harzianum and T. roseum.

4 - Antagonistic microorganisms may have an effect in reducing seed germination of chickpea only whereas there was no effect on broad bean seed germination. On the other hand, the pathogens prevent seed germination for both species. Moreover, when the antagonists were added to dishes in the presence of the pathogens, seed germination increased in case of broad bean seed treatment with T. harzianum or B. subtilis only.

5 - Culture filtrates of the antagonists T. harzianum, B. subtilis and Streptomyces sp helped in increasing the percentage of seed germination in the

presence of inculation with any of the pathogenic fungi, S. sclerotiorum, Scl. rolfsii and T. roseum

6 - The inoculation of seeds with any of the antagonists decreased the pre-and post emergence damping off and increased survival plants percentage as compared with the control (no antagonist was added to seeds sown in soil infested with any of the three pathogens). Among the investigated antagonists, T. harzianum seemed to show the highest antagonism against the pathogens especially S. sclerotiorum and Scl. rolfsii. However the inoculation with the three antagonists, T. harzianum B. subtilis and Streptomyces gave the lowest percentages of damping off and the highest percentages of survival plants. Seed inoculation with multiple antagonists showed that the antagonists intensified the antagonistic activity of each other against the investigated pathogens.

7 - Inoculation of the legume seeds (broad bean and chickpea) with the potent antagonist T. harzianum increased the length, fresh and dry weight of root and shoot system of broad bean and chickpea which were sown in soil infested with Scl. rolfsii.

8 - Seed treatment with crushed (homogenized) cultures of antagonists presented variable results to that obtained with infested seeds. On the other hand, when seeds of leguminous crops were wet before treatment with homogenized of antagonists, pre-and post emergence infection decreased and this reduction differed according to the reaction of crops and pathogens.

9 - Infestation of sterilized soil with S. sclerotiorum proved to be pathogenic to chickpea more than broad bean. On the other hand, broad bean seed treatment with T. harzianum B. subtilis, Streptomyces sp and their combination resulted in decreasing the percentage of pre-and post emergence damping off infection with S. sclerotiorum compared with untreated seeds, whereas chickpea infection was less affected with T. harzianum treatment. Addition of antagonists to soil before inoculation with any of the pathogens reduced the disease effectively by establishing T. harzianum in the soil before sowing. Moreover, the addition of antagonists to the soil was more effective in reducing percentage of pre and post emergence damping-off caused by Scl. rolfsii and S. sclerotiorum.

10 - Seed treated with antagonists namely T. harzianum, B. subtilis and Streptomyces sp before sowing in natural soil under field conditions increased the percentage of survival plant of lupine and broad bean compared with untreated seeds and seeds treated with Rhizolex T. Also the same treatments caused an increase in seeds weight yield/feddan for broad bean and lupine compared with untreated seeds. On the other hand, seed treated with antagonists resulted in an increase in seeds weight and yield/feddan more than those obtained from seeds treated with Rhizolex T. However, inculation of seeds of lentil and chickpea with antagonists did not gave a satisfactory results as for broad bean and lupine.