Biological control of tomato Fusarium wilt caused by *Fusarium oxysporum* fsp.*lycopersici* by using *Trichoderma harzianum* and mycorrhiza *Glomus mosseae*

By

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Abstract

This study was conducted in the laboratories of the Department of Plant Protection , College of Agriculture , University of Basra .during the period from 1/11/2015 – 1/6/2016 ,to evaluate the interaction efficiency between *Glomus.mosseae* and bio agent *Trichoderma.harzianum* against tomato fusarium wilt disease caused by *Fusarium oxysporum* f.sp *lycopersici* .

.The results showed the role of *T.harzianum in* inhibiting the growth of pathogenic fungus where the antagonism degree is of class 1 according to Bell scale. Also it showed that *T.harzianum* exaudate inhibited the growth of pathogen.

The results also explained a significant effect of mycorrhiza *G.mosseae* and *T.harzianum* and their interaction on seed germination percent and growth of tomato plant (pots experience) , As regards to the lengths of the plants after six weeks from germination the results indicated a significant difference among the treatments , the lengths of plants reached 4.55 ,18.22 , 14.44, 18.00, 15.33, 15.44, 15.55, cm for the treatments , F, T ,M, MT , MF , TF and MTF, respectively compared to control which amounted to 12.33 cm ,*T.harzianum*

led to increase the lengths of Plant significantly .The interaction between T *harzianum* and *G.mosseae* (TM) also led to increase the fresh weight in comparison with control which reached respectively 2.83 and 0.51. The field experiment results showed significant differences in the severity of the infection with pathogen where the less severe of the infection was found in the treatment MF which was 22.21 % followed by TF and MTF treatments which were 27.77 and 35.01% respectively. The plant lengths also significantly increased , it reached 72.1 cm in the treatment MTF followed by the treatment MT , M , MF and T which reached 69.9, 68.9 , 65.4 and 63.8 respectively , which they significantly differed with control and pathogen treatments which were 55.3 and 47.2 cm respectively .

The treatment TF led to increase the shoot fresh weight up to 40.0 gm. , followed by MF , M,T, MTF and MT which were 35.0, 34.5 , 32.3 , 30.0 and 29.7 which significantly differed with control and pathogen treatment which reached 17.33 and 13.7 respectively . The root fresh weight also increased when *G.mosseae* was used , it reached 29.53 gm. compared with control (17.7 gm.).The results indicated the role of *G.mosseae* in increasing fruit weight which reached 3.067 kg Plant compared with control which was 1.630 kg/plant .The results also showed the role of *G.mosseae* in increasing the enzymatic activity of peroxidase which reached 1.710 unit/gm. Compared to control which reached 0.510 unit/ gm wet weight . The results of field experiment also revealed that *T.harzianum* and *G.mossese* increased the amount of phosphor in tomato Plants in a percent of 38.93 , 38.44 , 28.93 , 28.93 , 26.58 , and 23.91 mg / kg for the treatment MF , M , T , MT , MTF and TF respectively in with comparison with control which was 21.23 mg / kg. From

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other hand , the interaction between *G.mosseae* and *T.harzianum* led to increase the root infection percent and infection up to 66 and 58% respectively the treatment M, MTF , MF as they were 38.00 , 36.66% 37.66 , 34% 31.33 , 32.00% . Finaly the results elucidate that the interaction between *G.mosseae* and *T.harzianum* led to increase the number of spores of *G.mosseae* reaching to 45.83 spore/ plant followed by the treatment M , MTF , MF , which gave 29.16 , 22.50 , and 16.66 , spores / plant respectively .