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Summary

- Identification of the associated fungi isolated from rotted roots of apricot obtained from different locations of the new reclaimed area *i.e.* Nobaria, Ameria, Wady El-Natroon and El-Arish revealed that *F. solani*, *R. solani*, *B. theobromae* and *M. phaseolina* were the prevailing organisms.

Several other fungi were isolated in low frequencies, accordingly they were canceled while the fungal bio-agent *Trichoderma harzianum* were kept, then used in the biological control studies during the course of disease control.

- No correlation between fungus frequency and its pathogenic capability was observed. Accordingly, the tested fungi significantly differed in their responsibility to cause the disease. Pathogenicity test indicated that the tested fungi can be arranged due to their pathogenic capabilities such as: *R. solani*, *M. phaseolina*, *B. theobromae* and *F. solani*.

At the same time it was clear that prolonging disease assessment period increased disease percentage. Thirty days after soil infestation gave the lesser dead nurselings percentage while 45 and 60 days after soil infestation showed the highest and higher disease incidence, respectively.

-Experimental results of varietal reaction indicated that the four tested apricot varieties may be arranged dissendly as Balady followed by Amar, Canino and Hamawy ascribed to their susceptibility to disease incidence.

Also, the same trend of pathogenicity test was obtained in relation to the causal pathogens. according, they were arranged due to their action on the roots of the tested varieties as *R. solani*, *M. phaseolina*, *B. theobromae* and *F. solani*

-Apricot nurselings 1 year-old were more susceptible to the causal pathogens of root rot disease than the older ones 2 and 3 year-old, respectively.

The tested pathogens revealed the same trend of their pathogenesis capabilities which was observed at pathogenicity tests. *R. solani* followed by *M. phaseolina* then *B. theobromae* and finally *F. solani* were arranged according to their effect. Generally, increasing of plant age led to significant minimizing of disease incidence.

-Soil properties is considered one of the most affectives factors on soil-borne fungi and percentage of disease incidence. To study the effect of chemical and mechanical characters on apricot root rot three types of soil were tested. Data obtained illustrated that calcareous soil was the most affective than sandy and loamy soil.

The principle reason was their effect on soil humidity and predisposition of roots to fungal attack. *B. theobromae* followed by *F. solani* were the most aggressive in all tested soil while *R. solani* and *M. phaseolina* were the less.

-Two irrigation systems were investigated to study their effect on disease occurrence of apricot root rot. Data obtained expressed as infection percentage of dead nurselings 1 year-old after 60 days of planting in infesting soil at (5 % w/w) with each tested pathogen revealed that surface irrigation was more affective than drip irrigation system in respect to each pathogen. At the same time, according to the percentage of dead nurselings the tested fungi were arrange accordingly as *R solani*, *M. phaseolina*, *B. theobromae* and at last *F. solani*.

- Chemical fertilizers are the most important factors to complete the efficiency of the mineral nutrition and on the other side they affected soil-borne organisms. Accordingly, these trials were conducted to test their effect on disease incidence of apricot root rot.

In chemical fertilizers treatments data obtained illustrated that ammonium sulphate was an encourage factor to increase apricot infection. The contrast was observed with calcium super phosphate and potassium sulphate, respectively.

At the same time adding of the three tested fertilizers significantly affected the associated pathogens.

F. solani was the most affected one since it gave the less infection percentage (38.89 %). The other pathogens were affected differently. *R. solani* showed the great effect since it was yielded 71.2 % of infection percentage followed by *M. phaseolina* 55.7 % and finally *B. theobromae* showed disease incidence reached to 59.7 %. On the other hand, time of fertilizers adding was considered one of the most valuable factors which affect disease occurrence of apricot root rot .

Adding chemical fertilizers before cultivating apricot nurselings and also before soil infestation with each tested pathogen revealed the less infection percentage. On the other hand, the highest percentage of disease incidence was obtained when soil infestation and nurseling plantation were carried out before fertilizers adding.

- In accordance with the recent global attitude using biological agents to control soil-borne disease was occupied an advanced situation. In this research the attention was objected to used the isolated antagonistic bio-agent from apricot rhizosphere i.e. *T. harzianum* and *B. subtilis* and the bio-cides produced and registered under the Egyptian environmental circumstances such as Bio ARC and Bio Zeid. Significant differences

were obtained related to the reduction percentage of disease incidence. Data obtained indicated that all tested bio-agents *T. harzianum*, *T. album* (Bio Zeid), *B. subtilis* and *B. megaterium* were significantly reduced infection percentages by all the tested causal pathogens of apricot root-rot disease at various degrees. The reduction percentage was arranged from 50 % to 75 %. This conclusion enhanced the important role of using biological to produce safety foods and keep the human health. Adding duration of bio-agent to the infested soil led to various percentages of disease incidence. The higher damage was obtained when the soil was infested before adding the bio-agent while the contrary was yielded when the bio-agent was firstly added before soil was infested.

- To avoid the serious threat to human health yielded by the used fungicides to control soil borne diseases attention was objected during the course of this investigation to find out other techniques of control. Therefore, plant extracts of four medicinal and aromatic plants i.e. blue gum, mint, basil and thyme were used to evaluate their inhibitory effect against the causal pathogens of apricot root rot. Data obtained clear that all tested extracts significantly affected disease incidence percentages compared with control treatments. Effect of these used extracts was differed from pathogen to another. Thyme (*thymus vulgaris*) followed by blue gum (*Eucalyptus globulus*) were the most effective extracts. Basil (*Ocinum basilicum*) and mint (*Mentha spicata* var. *viridis*) revealed that less effect, respectively. On the other hand, as general *B. theobromae* followed by *F. solani* were the most affective pathogens respectively although they caused the less percentages of disease incidence. The contrary was obtained in relation to the two other pathogens *R. solani* and *M. phaseolina*.

-Efficiency of the three classical soil fungicides i.e. Rizolex T, Topsin M 70 and Vitavax/Thiram was evaluated against the causal pathogens of apricot root rot. Data obtained showed that all tested fungicides affected disease incidence differently. Rizolex T gave the best effect against *R. solani* and *M. phaseolina* while Topsin M 70 was the best fungicides against *B. theobromae*. Vitavax/Thiram was the superior against *F. solani*.