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شبكة المعلومات الجامعية



شبكة المعلومات الجامعية

التوثيق الالكتروني والميكرو فيلم

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# **STUDIES ON THE MANAGEMENT OF SOME PLANT PARASITIC NEMATODES ON OLIVE**

**BY**

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**B.Sc. Agric. Sci. (Pesticides)**

**Cairo University 1990**

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**Cairo University 1996**

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**( Nematology)**

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**Faculty of Agriculture**

**Cairo University**

**2001**

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### ABSTRACT

A survey carried out in 5 different localities namely, Ismailia, Areesh, Sadat, Nobaria and Fayoum showed the presence of nine nematode genera of common association with olive. These genera are *Meloidogyne*, *Rotylenchulus*, *Tylenchulus*, *Pratylenchus*, *Helicotylenchus*, *Ditylenchus*, *Tylenchus* and *Macropothonia*. The root-knot nematodes, *Meloidogyne* spp. are the most frequent in the five surveyed localities followed by *Rotylenchulus reniformis* and *Tylenchulus semipenetrans* - El-Nobaria showed the highest frequency of the root-knot and the reniform nematode occurrence. The study of the economic threshold of the root-knot nematode *M. incognita* on five olive cultivars showed that the nematode reproduced variabley on the five tested cultivars. Nematode final population increased with the increasing initial inoculum level. The cultivar hamed was the most susceptible followed by picual, karotina and manzanillo, however the cultivar dolsy exhibited some resistance.

The seasonal variations of the root-knot nematode, *M. incognita* on three olive cultivars in sandy and calcareous soils was studied. Sandy soil was favor to nematode infectivity and reproduction than calcareous soil especially on the susceptible cultivar, hamed which harbored higher numbers of soil population, galls and egg-masses /g root than those on picual and manzanillo at any time of the year in both soil types. Organic matter of plant and animal origin namely, poultry droppings (PO), pigeon droppings (PI), eucalyptus dry leaves (E), garlic fresh leaves (G) at the rate of 10 g./pot, the nematicides temik (T) and vydate (V) at half and full recommended doses as well as the biocide nemaless (NL) were used to control the root-knot nematode, *M. incognita* infecting olive cultivars under green house conditions. The organic matter were added to pots soil in certain sequences for 3 months with one month interval with or without half dose of nematicides. All the tested sequences of additions significantly reduced the numbers of nematodes in soil and on roots. The recommended dose of vydate (V) added once, one month after nematode inoculation, accomplished the best significant results with c.v. hamed, the most susceptible cultivar, followed by the sequence (E+G+PI), (PO+E+PO). The organic matter, poultry or pigeon droppings, eucalyptus dry leaves and garlic fresh leaves could efficiently control the root-knot nematode especially under moderate levels of nematode infestations. However, under severe infestation, nematicides might be applied first to reduce the populations to levels could be managed by the application of organic materials. Thus, vydate gave the best result with c.v. hamed, the most susceptible cultivar, while on moderately susceptible cultivars, i.e. karotina, manzanillo and picual. The organic matter overmastered the nematicides in the majority of cases. Under low levels of nematode infestation like on c.v. dolsy there were no differences between organic matter and nematicides in reducing nematode populations. The role of organic matter in

improving the growth of the infected plants is supplemental advantage make it highly recommended to be used in the management of the root-knot nematodes in olive orchards.

Results of the management of the root-knot nematode, *M. incognita* under field conditions proved that programs included poultry dropping, garlic leaves, pigeon dropping, eucalyptus dry leaves, olive pomace when three of them were added in certain sequence with one month interval, implemented very good results and were efficient in reducing nematode numbers on olive from the beginning until the end of six months. These materials are more or at least equally efficient to nematicides in the trial carried out in the season of 1998. The addition of these organic matter at the rates of 500-1000 grams/tree in the sequences (OP+PO+E), (E+G+PI) or (0,5MO+E+PO) gave the best significant results in reducing nematode populations and improving the yield of fruits / tree.

Results of the second season (1999) also emphasized the results of the greenhouse trial that when olive trees infected initially with high numbers of nematode, it should be treated first with nematicides to minimize the populations to levels could be managed thereafter with organic matter for a long period of time. Or the programs applied to manage nematode population under these circumstances should at least start with lower doses of nematicides to help in reducing nematode populations to that levels could be controlled by the organic matter. In the second trial of the season of 1999, new organic materials were introduced to the management programs or used in three repeated doses with one month interval. It is evident that combination of different organic matter resulted in lower numbers of nematodes in soil and on roots varied significantly with those resulted from repeating the addition of the same organic matter except for repeating the addition of garlic or neem leaves and poultry droppings at the end of three months.

Fatty acid composition of olive oil from fruits of healthy, infected and treated olive trees were determined. In healthy fruits, the saturated fatty acids (palmitic, stearic and araduidic) represented 12-1% of which palmitic constituted 74.38 % of the total saturated area. While the unsaturated fatty acids (oleic, linoleic, linolenic and palmitoleic) represented 87.9 % of which oleic constituted 91-35% of the total unsaturated area, followed by linoleic (7.16%). Infection with *Meloidogyne incognita* resulted in decreasing the percentage of unsaturated fatty acids and the highest reduction was observed in the major unsaturated fatty acid, oleic, however linoleic increased. The saturated fatty acids increased from 12.1 to 21.66%. Management of the root knot nematode bring the fatty acid composition of olive oil back to be almost like that initially synthesized in fruits of healthy trees. Also, programs included poultry droppings, eucalyptus leaves, olive pomace, garlic cloves on those started with half of the recommended doses of mocap or vydate or nemacur accomplished the best results.

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## **Dedication**

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Great thanks to **my mother, brothers and sisters.**

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