ECOLOGICAL STUDY ON NEMATODES ASSOCIATED WITH CANTALOUPE CROP UNDER NEWLY SOILS CONDITIONS.

BY

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B .Sc. of Agriculture, Faculty, Ain Shams University1990

A thesis submitted in partial fulfillment
of
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in

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ABSTRACT

Data of the previous study revealed that root-knot nematode was the common nematode disease on cantaloupe in the Northern reclaimed area in Egypt. This problem is one of the most determined factors of productivity of cantaloupe. The management of this nematode disease on cantaloupe. The previous study supported the possibility of nematode control by usage some of non-chemical control nematodes which gave a very promising results in this concern, specially when compare with the other chemical compounds. Use of organic matter as an additive materials to the soil induce biological changes in the soil as it include many microorganisms like fungi and bacteria and some other non-parasitic nematode genera and predators of the parasitic nematode. All these microorganisms may be have on adversely effect against the parasitic nematode . The effective of organic matter against nematode depend on the source of organic matter and quartzite of it in the soil and also on the soil type and how much it has from the benefit microorganisms to effect the plant growth.

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INTRODUCTION

Cantaloupe (***cucumismelo.v.cantaloupensis)*** is one of the most important economic vegetable crops in Egypt and can be produced during the four seasons under Egyptian conditions which give it a good chance for export . The cultivated area of cantaloupe in Egypt reached 235811feddans with average production 15tons per feddans according to the report of Ministry of agriculture for statistics 2004 .However cantaloupe is attacked by many different diseases which cause a decrease in plant growth and yield production .The crop extensions are intensively being in the newly reclaimed lands at which the plant- parasitic nematodes become one of major problems The root–knot nematode *Meloidogyne* spp is one of the most important nematode pests . Therefore cantaloupe is subjected to the infection with root–knot nematode in this area. El-gindi *et al* .,(1979) cited that root- knot nematodes are the wide spread nematode disease in these areas and are becoming a real threat to agriculture especially in localities with light sandy soil. Decrease in cantaloupe yield is estimated nearly 60 -80 % or more under Egyptian conditions. Ibrahim (1985 &1986). Chemical control of root-knot nematode has successfully limited the effect of this nematode below damaging levels. However environmental health problems and disturbance in the nature biological balance that resulted by extensive use of nematicides have enhanced scientists to search for another alternative nematode management .Biological activity of the soil is changed by adding the organic amendments to the soil. The soil organic matters is directly correlated with beneficial soil physical chemical and biological soil properties such as potential soil productivity, soil structure, soil fertility etc of agricultural system. Therefore the present work was undertaken with the following aims in view:

1-Determine the frequency of occurrence and distribution of plant parasitic nematode associated with cantaloupe in some governorates of north Egypt .

2-Evaluation the susceptibility of some cantaloupe cultivars to the infection with root – knot nematode.

3-Study the effect of different inoculum levels of root- knot nematode on cantaloupe plant.

4-Study the effect of different time of cultivation on the infection of cantaloupe with root- knot nematode .

5- Study the seasonal fluctuations of root- knot nematode associated with cantaloupe plantation under newly reclaimed sandy soils.

6- Evaluation of some non-chemical methods to control root-knot nematode on cantaloupe plants .

REVIEW OF LITERATURE1

1-Ecological studies:

Occurrence and distribution of plant-parasitic nematodes associated with cantaloupe (*cucumis melo.v.cantaloupensis)*

Plant –parasitic nematodes attacking cucurbitaceous plants were recorded by several investigator all over the world **.**

Otiefa *etal* .,(1970) reported that squash c.pepo , var .melopep is an excellent host to *M.incognita* in sandy soils .

Katcho (1972) in Iraq reported watermelon as a host for *M.incognita , M.arenaria* and *M.javanica* in sandy soils.

Ailarova (1973) found that the most economic plant-parasitic nematode that cause damage

Johnson and Harmon (1974) reported that the root –knot nematodes *Meloidogyne incognita* and *M. incognita acrita* were also recorded to attack cantaloupe crop specially in sandy soils .

Heald (1975) reported that Cantaloupe (Cucumis melo) infected by Meloidogyne incognita , Aphelenchus avenae , Helicotylenchus nannus and Rotylenchulus reniformis.

Taylor (1976) found that cantaloupe is one of the most susceptible crop for root-knot nematode.

Mahros(1976) reported that the genera *Helicotylenchus ,Meloidogyne, pratylenchus, Rotylenchulus* and *Tylenchorhynchus* were found in a relatively high frequency of occurrence in fields of cucurbit plants in certain counties of Sharkia governorate .

Osman (1977) reported that *M.incognita acrita.,M.javanica* and *Heterodera trifolii* were also reported to be in association and attack squash root .

El gindi *et al* ., (1979) cited that nematological studied have shown that root-knot nematode are of wide spread occurrence and becoming a real threat to agriculture especially in localities with

light sandy soil in Egypt.

Mousa *et al* .,(1981) found that a survey root samples from cantaloupe ,cucumber , squash, sweet melon and watermelon crops from18 sites in north Egypt indicated the occurrence of 4 *Meloidogyne* spp . In descending order of frequency *M.incognita* was found in 52 % of samples .

Ibrahim (1986) found that three species namely *M.incognita* ,*M.javanica* and *M.arenaria* were found in the surveyed agrarian areas in Egypt .The first two species are widely distributed while *M. arenaria* is of limited occurrence .

Robinson *et al.,* (1987) evaluated the influence of soil texture and land–Use on the geographical distributions of *Rotylenchulus reniformis ,Meloidogyneincognita* and *Tylenchus* in the lower kiosk grand valley .They found that the distributions of R.*reniformis* and *M.incognita* were related to soil texture . They also reported that incidence of *M.incognita* was greatest in elevated sandy loam.

Mousa (1997) found that the *Meloidogyne* spp was greatest in the sandy soil in new reclaimed areas of Nubariya,El-Tahrir and El Salhiya.He also reproted that the lowest occurrence of the nematode was noticed in the heavy soil of the middle Delta regionand upper Egypt .

Abd Elgawad *et al*.,(2000) cited that a survey of plant-parasitic nematodes in cucubitaceous fields revealed the presence of the genera *cricomenoides ,Ditylenchus ,Helicotylenchus , Heterodera, Partylenchus, Rotylenchulus, Tylenchus, Tylenchornchus* on all cucurbits sampled(cucumber ,squash and water melon. Population density level of *pratylenchus* and *Meloidogyne* were dominate and had the highest encountered numbers .

Ibrahim *et al* ., (2000) found that in north western Egypt a total of 220 soil and root samples showed the presence of mixed

population of 26 genera and 38 species of parasitic nematodes root-knot nematodes were found with 34 occurrences followed by spiral ,stunt ring lesion and dagger nematodes .

Ibrahim *et al* .,(2001) They cited that root – knot nematodes were found with relatively high frequency in a survey in North western Egypt followed by sprial , stunt lesion and dagger nematode

Abd Gharbieh andAL-Azzeh (2004) Studied the occurrence and distribution of plant – parasitic nematodes in Arab countries and reported that *Meloidogyne* spp are of wide distribution in Egypt .

II -Host Susceptibility

Evaluation of cantaloupe cultivars for their susceptibility to the root-knot nematodes *M.incognita* have been studied by several investigators **In 1956 ,Gaskin and crittenden** also tested some cucurbitaceous plants including cantaloupe and found that all the tested plants were very susceptible to *Meloidogyne incognita ,M.acrita , M.javanica* .

Thomason and McKinney(1959) tested fifty varieties of six cucurbits (8 cucumber,19 cantaloupe one watermelon one pumpkin and squashes) for their susceptibility to three species of root-knot nematode .They found that the fifty varieties were susceptible to *M.incognita acrita* and thirty three were susceptible to *M. javanica*

Winstead and Riggs (1959) tested 83 varieties and lines of watermelon and cantaloupe for their susceptibility to *M.arenaria, M.javanica, M.hapla* and two populations of *M.incognita acrita.* All the varieties were susceptible to the tested root-knot nematode population except *M.hapla* .

Fassuliotis and Rau (1963) found that all the 1465 varieties of *cucumis spp* intro-the U.S.A were susceptible to *M.incognita* except only one variety .**In 1967 Fassuliotis** tested 14 *cucumis* spp