SUMMARY

SUMMARY AND CONCLUSION

1. ACAROLOGICAL RESULTS

Onion (*Allium cepa* L. and broad bean (*Vicia faba* L.) are important economic crops in Egypt, due to their local consumption and abroad exportation. Also, fodder beet (*Beta vulgaris* L.) is considered the most productive forage plant, having high concentration of nutrients in its dry matter, which is about similar to that of fresh leaves of sugar beet and maize silage. In our country, mites became serious pestes of different field crops due to the recent favourable weather conditions, which allowed remarkable abundance of mites throughout the year.

Naturally, the aforementioned crops are frequently liable to mites attack, their by qualitatvely as well as quantitatively reduced production is obtained. Therefore, it felt necessary, in the present study, to survey of different soil Acari groups, observe seasonal variations in their population densities and study the effect of soil fertilizers on these creatures under onion, fodder beet and broad bean in Qualubia Governorate from December 1993 to May 1994. Astigmata group not only occured in high numbers but also dominated other groups of the Acari under the three hosts. Mites of such group are known to be very poorly studied, so, therefore special attention was paid to identifey their individualsr to the species level. Qualitative and quantitative composition and effect of soil fertilizers on population density of these species were also, discussed under onion, fodder beet and broad bean.

Results obtained could be summmearized as follows.

1) Soil mites, which were collected in association with onion, Fodder beet and broad bean belong to five major groups: Astigmata, Cryptostigmata, Heterostigmata, Prostigmata and Mesostigmata. The first date of transplanting of onion Giza 6 and Giza 20 had a significant increase in mite population density than the second date (January 1). In Giza 6 field, density of soil Acari reached the maxima in January and March, while in Giza 20 field the maximum population density occurred in February. The population dynamics of soil acri associated with fodder beet and broad bean reached the maxima in February. Astigmata in onion, fodder beet and broad bean fields, not only occurred in great abundance but also numbers dominated those of other Acari groups. While Cryptostigmata and Mesostigmata seemed to be numerically insignificant compared with other Acari groups. All mites in both varieties of onion Giza 20 and Giza 6 fields reached their maxima in February and March, while under Fodder beet and broad bean occurred in February.

2) Nitrogenous fertilizer (NH_4NO_3, 33.5%N) in onion significant by effect in increased the population density of soil Acari in comparison with the check. The recommended rate of 296 kg/fed. highly increased the mite population density especially in Giza 6 field., while at a higher nitrogens level of 358 kg/fed., the Acari groups tended to decrease in number. The population density of Astigmata in Giza 6 and Giza 20 highly increased with the rate of 269 kg/fed. ammonium nitrate. But the higher rate of nitrogen (358 kg/fed.) in

Giza 20 field flourished the population density of Cryptostigmata, Heterostigmata and Mesostigmata, while in Giza 6 field the population density of these groups tended to decrease in number. Urea plus potassium sulphate adopted in fodder beet field flourished soil Acari groups in comparatively with those treated with urea only. The population density of soil Acari highly increased with the rate of 100 kg/fed. urea plus 40 kg/fed. potassium sulphate. while at the higher rate of urea (120 kg/fed. plus the higher rate of potassium 100 kg/fed.) mite groups tended to decrease in number. The population density of Astigmata reached its maximum at the recommended rate of nitrogen (100 kg/fed.) plus the lower rate of potassium (40 kg/fed.).

3) Eight astigmatid mite species were found in onion field. These species are : ***Tyrophagous putrescentiae*** (Schr.), ***Rhizoglyphus echinopus*** F.R., ***Aleuroglyphus ovatus*** (Troup), ***Acarus siro*** Linne, ***Acotyledon*** sp.,***Gohieria fusca*** (Oudms), ***Anoetus*** sp. and ***Dermatophagoides farinae*** H.. In fodder beet and broad bean fields the same species were recorded without ***Gohieria fusca*** (Oudms) and ***Dermatophagoides farinae*** H.

Ty*rophagous putrescentiae* (Schr.) occurred in great number, which dominated other species under the three hosts, and showed two peaks in Giza 6 field during April and March at the two dates of transplanting, while in Giza 20 field only one peak occurred during February. Under fodder beet ***Tyrophagous putrescentiae*** (Schr.) had

two peaks in February and April, while under broad bean had two peaks in February and March.

Rhizoglyphus *echinopus* F.R. reached the maxima through December, 1993 in Giza 20 and during January 1994 in Giza 6 at the first transplanting date, while ***Aleuroglyphus ovatus*** (Troup) reached the maxima through January in Giza 20 at the first date of transplanting. (44 inds/1000 cc soil). In broad bean the same species had only one peak in January with a density of 34 ind./1000 cc soil.

4) In onion field nitrogenous fertilizer with a rate of (269 kg/fed.) urea caused a positive effect on population growth of Astigmata in comparison with the check, while at a high nitrogen level of 358 kg/fed., the astigmatid mite species tended to decrease in density comparing with the recommended rate.

The species ***Tyrophagous putrescentiae*** (Schr.), ***Aleuroglyphus ovatus*** (Troup) and ***Rhizoglyphus echinopus*** F.R. were dominant, since they constituted 89.4, 5.2 and 3.4% of all astigmatid mites collected from Giza 6 field.

In fodder beet field, population density of Acarid mites, highly increased at the recommended rate of urea (100 kg/fed.) plus the lower rate of potassium sulphate (40 kg/fed.). However, at a high and low nitrogen levels of 120 and 50 kg/fed. plus the higher rate of potassium sulphate (100 kg/fed.) the population density tended to

decrease. ***Tyrophagous putrescentiae*** (Schr.) not only occurred in great abundance, but also predominated all other Acarid species.

2. NEMATOLOGICAL RESULTS

Survey:

The present study includes a survey of different genera of plant parasitic nematode inhabiting onion, broad bean and fodder beet.

The results detected showed the following :

1) Six nematode genera, had specific representatives associated with the above mentioned crops, namely, ***Pratylenchus***, ***Tylenchus***, ***Heterodera***, ***Ditylenchus***, ***Tylenchorhynchus***, and ***Aphelenchus***.

2) The plant nematode genera ***Pratylenchus***, ***Aphelenchus*** and ***Tylenchorhynchus*** followed by ***Heterodera*** were recorded to have specific representatives in high population density.

3) Onion field was mainly contaminated with nematode species belonging to genera ***Pratylenchus***, ***Heterodera***, ***Tylenchorhynchus*** and ***Aphelenchus***. These plant nematode genera were recorded in a high population density, while specific representing genera ***Tylenchus***, and ***Ditylenchus*** presented in low frequent occurrence.

4) The early date of transplanting (1st December) of the two cultivars of onion cvs. Giza 6 and Giza 20, significantly increased population of nematode genera as comparing with the late date (1st January).

5) At the early date (1st December) a high population of nematode genera representatives occurred in March, while the lowest density was achieved in December in case of the cultivar Giza 6. The same trend was obsereved with the cultivar Giza 20 too.

6) In fodder beet field the population density of specific members of genera ***Pratylenchus***, ***Tylenchus***, and ***Heterodera***, increased gradually to reach there high population in March, while the nematode population decreased at the end of the growing season.

7) In broad bean specific representing genus ***Pratylenchus*** showed its high population density in January, while the population decreased at the end of the growing season (April and May). Genera ***Heterodera***, ***Tylenchorhynchus*** and ***Aphelenchus*** showed its maximum population in February.

Effect of the application of ammonium nitrate on onion

1) The low rate of ammonium nitrate, significantly increased the population density of specific belonging to genus ***Pratylenchus*** in soil as comparing with the other treatment in case of cultivar Giza 20.

2) The three rates of ammonium nitrate suppressed the population of specific representing genus ***Pratylenchus*** in onion cultivar Giza 6, and same trend was also observed in the population of specific members of genus ***Tylenchus*** in the two onion cultivars.

3) By increasing the rates of ammonium nitrate the population of ***Tylenchorhynchus*** species, gradually decreased in the two cultivars, while genus ***Ditylenchus*** gave the same trend in cultivar Giza 20.

4) Application of ammonium nitrate increased the population of ***Heterodera*** and ***Aphelenchus*** representing species in different levels in the two cultivars.

Effect of combination of urea and potassium sulphate on fodder beet

1) The combination of both fertilizers increased, significantly, the population of specific members of ***Pratylenchus***, while by increasing the rate of potassium sulphate the population gradually decreased.

2) The application of the low rate of urea plus the three rates of potassium sulphate, reflected the highest population number of the genera ***Ditylenchus*** and ***Aphelenchus***, representatives.

Effect of plant extracts on devlopment of *Melaidogyne incoginita*

1) Both extracts of aceton and petroleum ether of American coneflower stimulated the egg hatching of ***M. incognita*** at the two concentrations of 200 & 400 ppm.

2) Egg hatching was slightly stimulated in the low concentration of fenugreek (petroleum ether extract) and melia (aceton extract).

3) The highest rate of nematode mortality occurred by the high concentration of the plants extracts. The high concentration of neem and fenugreek (petroleum ether extract) recorded the highest mortality percent.

Effect of dried powder of some plants species on development of *Meloidoyina incognita* infected sunflower

1) All tested plant parts were toxic to root-knot nematode to varying extents. The nematode development decreased as the rate of dry powder increased.

2) The application of the different rates of neem dry powder gave the highest reduction in nematodes final population on root followed by melia.

3) Gall formation and eggmasses number, were highly, reduced with any of high rates of tested plant dry powder, seeming to attain highest percent of decrease, in case of melia and neem.

4) The increement of plant growth was positively correlated with the increase in the rate of added plant powder of all tested plants. Application of the moderate and high rate of fenugreek improved the plant growth.