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Summary

Soya bean considered as one of the important legume crops. It cultivated mainly for feeding and oil production. Soya bean seeds contain about 20% oil free cholesterol and about 40% proteins; these proteins are similar in its nutritive value to those of livestock animals. However, through the last ten years the cultivated area was decreased because of high costs of production and low benefits.

Experiments were conducted at Tahla village, Benha, Oualubia Governorate during the two successive seasons of 1999 and 2000. Meanwhile, laboratory studies were carried out in the laboratory of vegetable pests Department (PPRI), Dokki, Giza during the period from July 2001, till July 2003.

The aim of this work:-

- Study population fluctuation of major insect pests and predators associated with Soya bean plants.
- Investigate the population distribution of insect pests and predators on Soya bean plants.
- Study the effectiveness of certain treatments against the insect pests and predators on Soya bean plants.
- Determine certain biological aspects, reproductive potential and feeding capacity of two predators in the laboratory.

The obtained results could be summarized as follows:-

1.-Population fluctuation of major insect pests and predators on Soya bean plants

1.1- Population fluctuation of major insect pests:-

- The whitefly, *Bemisia tabaci* (Genn.) population:-

Date revealed that, the population of both adults and immature stages reached its maximum 90 days after sowing on August 8th, showing 383.1 individuals / 30 leaves (1999 season). While during season 2000 the maximum level

occurred 83 days after sowing on July 28th (411.8 individuals / 30 leaves)

- The peach aphid, *Myzus persicae* (Sulzer) population.

During 1999 season, the total mean of aphid population for different plant levels reached its maximum 83 days after sowing on August 1st (170.5 individuals / 30 leaves) 69 days after sowing.

-The population of Onion thrips, *Thrips tabaci* (Lind.):

During 1999 season, the mean of thrips population reached its maximum 55 day after sowing on July 4th, showing 100.5 individuals / 30 leaves. While during season 2000 the maximum level occurred 69 days after sowing on July 14th (105.8 individuals / 30 leaves).

-The broad bean leaf miner, *Liriomyza trifolii* (Burg.) population:-

Results indicated that, the total *L. trifolii* larvae and pupae population reached its maximum 69 days after sowing on July 18th (15.5 individuals / 30 leaves) during 1999; while during 2000 season, the total larvae and pupae population achieved its maximum 76 days after sowing on July 21st (16 individuals / 30 leaves)

1.2-Population fluctuation of major predators.

-The population of predator, *Coccinella undecimpunctata* L.

Date revealed that, the population of both adults and immature stages reached its maximum on July 25th (106.5 individuals / 30 leaves) during 1999 season. While during season 2000, the maximum level occurred on August 11st (91.5 individuals / 30 leaves).

- The population of predator, *Chrysoperla carnea* Steph.

Date indicated that population of *Ch. carnea*, adults (63 individuals / 30 leaves) during 1999 season. While during 2000 season

The total adults and immature stages population achieved its maximum on July 14th (68.5 individuals / 30 leaves).

- The population of predator *Orius albidipennis* Reut.-

Results showed that, the total mean population of nymphs reached its maximum on July 25th (40.5 nymphs / 30 leaves) during 1999 season. While during 2000 season, the maximum level occurred on July 14th (46.5 nymphs / 30 leaves).

1.3- Population distribution of major insect pests and predators on Soya bean plants:-

1.3.1- Population distribution of major insect pests:

- *Bemisia tabaci* (Genn.)

Data indicated that, the upper part of Soya bean plants harboured the highest *B. tabaci* adults followed by the middle and the lower part, which showed the lowest population during the two seasons. While, the middle part had the highest *B. tabaci* immature stages followed by the lower and the upper part during the two seasons.

-*Myzus persicae* (Sulzer):

Data revealed that, the middle part of Soya bean plants had the highest population followed by Upper part, while the lower part had the lowest population.

- *Thrips tabaci* (Lind.):

Data indicated that, the middle part of Soya bean plants had the highest population of *T. tabaci* followed by upper and the lower part.

- *Liriomyza trifolii* (Burg.):

Results showed that, the lower part of Soya bean plants harboured the highest population of *L. trifolii*, larvae and pupae followed by the middle and upper part, which showed the lowest one.

1.3.2- population distribution of major predators:

- *Coccinella undecimpunctata* L.

Data revealed that, the upper part of Soya bean plants had shown the highest population of *C. undecimpunctata* adults followed by middle and lower part, while the middle part had the highest population of *C. undecimpunctata* immature stages followed by upper part and lower part, which showed the lowest one.

-*Chrysoperla carnea* (Steph):-

Date indicated that, the upper part received the highest population of *Ch. Carnea* adults followed by middle and lower part, which was the least preferred one. Meanwhile, the middle part of Soya bean plants harboured the highest immature stages population followed by the upper and lower part.

Orius albidipennis Reut

Date revealed that, middle plant level received the highest population followed by upper and lower level, which had the lowest one during the two seasons.

1.4- Effect of some factors on population fluctuation of major insect pests and predators on Soya bean plants.

1.4.1- Effect of plant age and certain biotic and abiotic factors affecting the population fluctuation of major insect pests on Soya bean plants:-

Results indicated that, the combined effect of plant age, weekly mean of three predators (*Coccinella*

undecimpunctata , *Chrysoperla carnea* and *Orius albidipennis*) and some climatic factors (daily mean maximum temperature, daily mean minimum temperature and daily mean relative humidity) was responsible for 85.3%, 70.0%, 76.9% and 80.0% of changes in the population of *Bemisia tabaci*, *Myzus persicae*, *Thrips tabaci* and *Liriomyza trifolii*, respectively during 1999 season, while it recorded 82.8%, 76.3%, 73.8% and 82.8% respectively in the second season (2000).

Such results are important in lightening integrated control of these insects.

1.4.2- Effect of certain insect preys and climatic factors on the population abundance of major predator on Soya bean plants:-

Obtained data indicated that, the combined effect of three species of insect preys (*Bemisia tabaci* , *Myzus persicae* and *Thrips tabaci*) and certain climatic factors (daily mean max. temp., daily mean min. temp. and daily mean R.H.) was responsible for 86.4% , 72.9% and 60.3% of changes in the population of predators *Coccinella undecimpunctata*, *Chrysoperla carnea* and *Orius albidipennis*, respectively during the first season (1999), while it was 83.3% , 68.5% and 61.9% for three predators respectively during the second season (2000).

2-Effectiveness of certain treatments against insect pests and predators on Soya bean plants:

2.1- Effectiveness of certain treatments against major insect pests of Soya bean:

The following materials were used:

1-Super masrona 94% EC. (Mineral oil) at 2.0, 1.0 and 0.5L / 100L.

2-Nat 1 96% EC (plant oil) at 2.0, 1.0 and 0.5L / 100L.

3-Biofly 3×10^7 conidia/ml (Bioinsecticide) at 200, 100 and 50ml/100L.

4-Bancol 50% WP (propesticide) at 1200,600 and 300g / 100L.

5-Selecran 72% Ec (chemical insecticide) at 187.5 cm³ / 100L.

The effectiveness of the various materials at the highest application rates against the various insects was as follows:

- *Bemisia tabaci* (Genn):

Selecron (73.9%) & (73.3%) > super masrona (63.5%) & (61.4%) > Nat 1 (54.0 %) & (55.5%) > Biofly (53.9%) & (51.9%) > Bancol (53.0%) & (50.3%) for adults stage during 1999 and 2000 seasons, respectively, while, Selecron (87.5%) & (72.3%) > Super masrona (59.9%) & (67.8%) > Nat 1 (69.3%) & (64.3%) for immature stages during 1999 and 2000 seasons, respectively.

- *Myzus persicae* (Sulzer)

Selecron (92.4%) & (80.8%) > super masrona (78.2%) & (72.95) > Nat1 (74.7%) & (66.9%) > Bancol (69.2%) & (60.4) > Biofly (66.0%) & (53.3%) for 1999 & 2000 seasons, respectively.

- *Thrips tabaci* (Lind):

Selecron (81.6%) & (77.0%) > super masrona (73.4%) & (66.0%) > Nat 1 (66.7%) & (64.4%) > Biofly (61.0%) & (57.2%) > Bancol (56.4%) & (54.1) for 1999 & 2000 seasons, respectively.

- *Liriomyza trifolii* (Burg.)

Bancol (74.3%) & (74.1%) > Selecron (69.3%) & (73.1%) > super masrona (37.8%) & (37.8%) > Biofly (35.5%) & (33.3%) > Nat 1 (33.2%) & (31.9%) for 1999 & 2000 seasons, respectively.

2.2- Effect of various materials on major predators:

Results of the highest tested application rates were as follows:

-Coccinella undecimpunctata L.

Selecron (79.8%) & (81.0%) > Bancol (45.0%) & (46.7%) > Biofly (32.3%) & (32.7%) > Nat 1 (15.3%) & (16.55%) > supper masrona (14.45%) & (15.2%) for adults stage during 1999 and 2000 seasons, respectively, while, Selecron (79.5%) & (81.2%) > Bancol (45.6%) & (44.7%) > Biofly (37.5%) & (35.5%) > Nat 1 (29.4%) & (28.4%) > super masrona (27.4%) & (25.8%) for larval stage during 1999 and 2000 seasons, respectively.

-Chrysoperla carnea (Steph.):

Selecron (76.0%) & (80.8%) > Bancol (40.9%) & (42.0%) > Biofly (34.5%) & (35.3%) > Nat 1 (28.3%) & (27.5%) > super masrona (25.0%) & (26.4%) for larval stage during 1999 and 2000 seasons, respectively,

-Orius albidipennis (Reut):-

Selecron (79.9%) & (82.7%) > Bancol (36.2%) & (36.8%) > Biofly (28.1%) & (28.3%) > Nat 1 (25.2%) & (26.8%) > supper masrona (23.3%) & (24.5%) for nymphal stage during 1999 and 2000 seasons, respectively.

Generally, results of 1999 and 2000 seasons indicated that, the mineral oil (super masrona), plant oil (Nat 1) and Biocides (Biofly) can be used effectively for controlling Soya bean pests whereas these compounds are more safe on natural enemies and environment, thus can be used in frame of an integrated pest management programs.

2.3-Effect of various treatments on seed yield of Soya bean plants:

Although, Selecron was the most effective compound for controlling Soya bean and gave the highest yield; other compounds under study could be used effectively in controlling Soya bean pests because they were less toxic on natural enemies and the environment.

3-Certain aspects on reproductive potential and feeding capacity of two predators, *Coccinella undecimpunctata* L. and *Chrysoperla carnea* (Steph.)

Studies were carried out in the laboratory of Vegetable Pests Department (PPRI), Dokki, Giza, during the period from July 2001, till July 2003 to evaluate feeding of two predators *Coccinella undecimpunctata* L. (Coccinellidae : Coleoptera) and *Chrysoperla carnea* (Steph.) (Chrysopidae: Neuroptera) on three species of Aphids, *Aphis gossypii* Glover, *Aphis craccivora* Koch and *Myzus persicae* Sulzer under laboratory conditions at $26\pm 1^{\circ}\text{C}$ and 65-70% R.H.

The results revealed that, *A. gossypii* was the best for rearing of the two predacious species, because the fecundity of two predacious insects was higher on this pest (596.3 ± 34.3 and 212.1 ± 14.5 eggs/ female of *C. undecimpunctata* and *Ch. carnea*, respectively) than the others, while the total consumption by the larval stage of the two previous predators was 795.4 ± 6.8 and 791.0 ± 8.6 aphid nymphs of *A. Gossypii*/larva, respectively, and the averages in number of deposited eggs per female of *C. undecimpunctata* and *Ch. carnea* were 11.5 ± 0.7 and 6.4 ± 0.6 eggs/day, respectively when reared on *A. gossypii*.