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INFLUENCE OF CONVENTIONAL AND NON. CONVENTIONAL INSECTICIDES AS WELL AS THE MACRO- AND MICRO ELEMENTS ON POPULATION DENSITY OF THE ONION THRIPS *Thrips tabaci* LIND.

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ABSTRACT

The experiments were carried out at Experimental Research Station, Faculty of Agriculture, Mansoura University during two successive seasons 2008 and 2009 to evaluate the efficacy of some conventional and non- conventional insecticides as well as the macro and micro elements against the onion thrips *Thrips tabaci* Lind.

The conventional insecticide Sumithion and non-conventional insecticides, Sulfer and Biofly exhibited a high efficiency against the onion thrips population with the highest percentage of reduction in the two successive seasons of the study. On the other hand, Radiant and Citrax oil exhibited intermediate efficiency against T. tabaci nymphs.

Moreover, soybean oil or cotton seed oil caused the lowest percentage of reduction after three, five or eight days after treatments. Statistical analysis recorded a highly significant differences ($P<0.01$) between the different conventional and non-conventional insecticides after three, five or eight days from treatments during the two seasons.

The micro-element Born was the highest effeciancy (the highest percentage of reduction) with (72.8 and 76.5%), (76.6 and 75.7%) (28.1 and 26.7%), (37.5 and 46.6%), and (57.4 and 60.3%) followed by Manganese (71.0 and 71.3%), (76.4 and 74.2%), (25.5 and 29.4%), (36.2 and 45.7%), and (54.7 and 55.1%) after one day, four days, one week, two weeks and three weeks from treatments in the two successive seasons (2008 and 2009), respectively.

On the other hand, micro element Zinc gave the intermediate percentage of reduction of T. tabaci nymphs during the two seasons of study. Moreover, the macro element Potassium exhibited the lowest percentage of reduction or the lowest effeciancy. Highly significant differences ($P<0.01$) were recorded between the different macro and micro elements during the two successive seasons.

INTRODUCTION

The onion crop in Egypt consider an important field crop both local consumption or for exportation. Onion plantations are oftently subject to considerable insects infestation which affected in the crop quality and quantity. Onion plants usually subject to infestation by different insect pests during their different stages of growth (El-Sherif 1971 in Egypt; Johnson and Marshall, 1986 in Hawaii; El-Bolok et al., 1990 in Egypt; Gupta *et al.,* 1994 in India; Ciocioal *et al.,* 2002 in Brazil; Szwejde 2005 in Poland and Mahmoud 2008 in Egypt).

The onion thrips *T. tabaci* is one of the main insect pests attacking onion plants during their different stages and caused a great damage which resulted to reduction in the crop (Salman and Abou-Elhaga 2001; Eltez and Karasavuran 2006 and Mahmoud 2008).

The conventional or non-conventional insecticides were used against *T. tabaci* exhibited a high efficiency in controlling the insect pest Musa and Taha (2001); Abdel-Aziz (2002) and Khattak *et al.*, (2006). Also, the application with macro elements as Potassium or micro elements as Zinc, Iron, Manganese or Born in the recommended concentrations gave a good results in reducing the population of the piercing-sucking insect pests as aphids, leafhoppers and thrips (Metwally and Gabr 1997; Concalves *et al.*, 2004 and El-Shrif 2009).

The aim of the present work is to study the influence of the conventional and non-conventional insecticides on the percentage of reduction of the onion thrips nymphs. Moreover, study the influence of macro- and micro elements on the percentage of reduction of the insect nymphs.

MATERIALS AND METHODS

Efficacy of conventional and non-conventional insecticides against onion thrips.

This trial was carried out at Experimental Research Station, Faculty of Agriculture, Mansoura University during two seasons 2008 and 2009 to evaluate the efficacy of some conventional and non- conventional insecticides against onion thrips with characterize have low toxicity to environment, plant and human. The trial started on February 13th and 15th for 2008 and 2009 seasons, respectively. Seven Treatments were distributed in complete randomized block design replicated three times. Each plot were consisted of four rows wide and 12m long with 10cm between rows and 5 cm between plant plot were separated approximately 1.m., to avoid drift of sprayed in addition to another one left without treatment as a check control. Samples were chosen with random, five plants from each plant samples were chosen with random, each plot. Spraying the onion crop was carried out in the early morning, one before treatment with counted onion thrips lives nymphs and adults and after 2, 5 and 8 days. Samples were placed in plastic bags and were taken to laboratory. Thrips stages were counted in laboratory by using stereoscopic binocular. The insecticides were used as following:-

1- Crude cotton seed oil at 7cm\1 Liter.
2- Soyabean oil at 10\ 1 Liter.
3- citrax 20%L (Citric acid 6000mg, Lactic acid 8000mg, Escorbic acid 5000 mg, Glycerin 17300mg. sodium chloride 4000 mg, ammonium pronate 2000mg and water up to 1000L.) at 7cm\ 1 liter.
4-Microns sulfur (sulfur) at 5g\ Liter.
5- Radient (Spinetoram 24%sc) at 1cm\ 1Liter.
6- Biofly (Beauveria bassiana) at 5g \ 1Lier.
7- Sumithion50%Ec (Fenitrothion) 2.5cm\ 1 Liter.

For preparation of emulsion cotton seed oil, soybean oil and citrus oil $0.5m^2$ of Tureen 80 (detergent) was added to one liter of each oil to keep them in solution during application.

The percentage of reduction for each treatment was calculated according to Handrson and Tilton's (1955).

Influence of macro- and micro elements on the percentage of reduction of thrips:-

This study was carried out during two successive seasons 2008 and 2009 to evaluate the effect of micro and Macro nutrient elements on population abundance of *T. tabaci* The experimental carried out on 2nd and 5th March 2008 and 2009 seasons, respectively. Four nutrient treatments were distributed in complete block design, and replicated three times. Plot consisted of 3 rows wide and 9 m long. 10 cm between rows and 5cm between plants. Five Plant samples were collected at random from each plot. Spraying was carried out in the early morning, at weekly intervals from 17 and 19 February to 3 and 2 April 2008 and 2009 seasons respectively. Onion thrips were counted before treatments and after that weekly, samples were taken to laboratory. All plots for each treatment received the following elements:-

1- Potassium (K) 2.5g\ 1Liter.
2- Manganese (Mn) 1.5g / 1 Liter
3- Zinc (Zn) 1.5g / 1 Liter.
4- Born (Br) 3g / 1 Liter.
5- Untreatment (control)

The percentage reduction for each treatment was calculated by using the formula:

$$\frac{\text{Number of thrips in control} - \text{Number of thrips in treatment}}{\text{Number of thrips in control}} * 100$$

RESULTS AND DISCUSSION

Influence of conventional and non-conventional insecticides against onion trips:-

Data illustrated in Table (1) represented the efficiency of some non-conventional insecticides and conventional insecticide (Sumithion) on the percentage of reduction of *T. tabaci* nymphs after three days from treatment.

Table (1): Influence of different insecticides treatments on the percentage of reduction of *T. tabaci* population after three days from treatments spraying

Element	Rate of application	The percentage of reduction	
		2008	2009
Soybean oil	10 cm/1 liter	31.0 e	41.0 e
Crude cotton seed oil	7 cm/1 liter	43.2 d	48.7 c
Citrax	7 cm/1 liter	34.3 e	44.8 d
Radient	1 cm/1 liter	48.7 c	49.5 c
Microns sulfur (sulfur)	5 g /1 liter	51.8 c	53.2 c
Biofly	5 g /1 liter	57.2 b	62.7 b
Sumithion50%Ec (Fenitrothion)	205cm/1 liter	76.3 a	73.7 a

Values labelled with the same letters in column are not significantly different at the 1% level of probability (One way ANOVA).

The obtained data revealed that, the highest percentage of reduction of *T. tabaci* nymph were 79.4 and 80.2% caused by sumithion treatment in the two seasons, respectively. Radiant and Citrax oil ranked the second category causing reduction in the population (58.5 and 79.5%) and (58.6 and 57.8%) in the two seasons, respectively. On the other hand, the lowest percentage of reduction caused by treatments soybean oil (41.3%) in the first season 2008 and Sulfer (41.3%) in the second season 2009.

Data arranged in Table (2) indicated that, after five days from treatment, also Sumithion was the highest percentage of reduction to *T. tabaci* nymphs with 76.3 and 73.7% during the two seasons, respectively. Biofly ranked the second place with 57.2 and 62.7% reduction in the population during 2008 and 2009, respectively. Moreover, Soybean oil came in the last category with the lowest percentage of reduction in nymphal population of *T. tabaci* with 31.0 and 41.0% after the five days from treatment in the two successive seasons, respectively.

Table (2): Influence of different insecticides treatments on the percentage of reduction of *T. tabaci* population after five days from treatments spraying.

Element	Rate of application	The percentage of reduction	
		2008	2009
Soybean oil	10 cm/1 liter	41.3 d	43.4 e
Crude cotton seed oil	7 cm/1 liter	49.7 c	47.5 d
Citrax	7 cm/1 liter	58.6 b	57.8 c
Radient	1 cm/1 liter	58.6 b	78.5 b
Microns sulfur (sulfur)	5 g /1 liter	38.3 d	41.3 e
Biofly	5 g /1 liter	52.4 c	53.3 d
Sumithion50%Ec (Fenitrothion)	205cm/1 liter	79.4 a	80.2 a

Values labelled with the same letters in column are not significantly different at the 1% level of probability (One way ANOVA).

Data represented in Table (3) showed the, Sulfer and Biofly exhibited the highest effeciancy after eight days from treatment causing reduction in *T. tabaci* nymphal population (99.5 and 100%) and (99.1 and 98.6%) followed by Sumithion (92.8 and 93.3%), Radiant (98.2 and 77.4%) and Cotton seed oil (52.5 and 46.4%) during the two successive seasons 2008 and 2009, respectively. On the other hand, the another non-conventional insecticidesillustrated in table (3) showed the lowest percentage of reduction in the nymphal population of *T. tabaci*.

Table (3): Influence of different insecticides treatments on the percentage of reduction of *T. tabaci* population after eight days from treatments spraying.

Element	Rate of application	The percentage of reduction	
		2008	2009
Soybean oil	10 cm/1 liter	25.8 d	27.4 e
Crude cotton seed oil	7 cm/1 liter	52.5 c	46.4 d
Citrax	7 cm/1 liter	30.7 d	31.2 e
Radient	1 cm/1 liter	98.2 a	77.4 c
Microns sulfur (sulfur)	5 g /1 liter	99.5 a	100.0 a
Biofly	5 g /1 liter	99.1 a	98.6 a
Sumithion50%Ec (Fenitrothion)	205cm/1 liter	92.8 b	93.3 b

Values labelled with the same letters in column are not significantly different at the 1% level of probability (One way ANOVA).

As a conclusion, data illustrated in Tables 1, 2 and 3 indicated that, the conventional insecticide Sumithion and non-conventional insecticides, Sulfer and Biofly exhibited a high efficiency against the onion thrips population with the highest percentage of reduction in the two successive seasons of the study. On the other hand, Radiant and Citrax oil exhibited intermediate efficiency against *T. tabaci* nymphs.

Moreover, Soybean oil or Cotton seed oil caused the lowest percentage of reduction after three, five or eight days after treatments. Statistical analysis recorded a highly significant differences ($P<0.01$) between the different conventional and non-conventional insecticides after three, five or eight days from treatments during the two seasons. These results are in agreement with those of Abd El-Aziz (2002), Mousa (2003), El-Hamid and Ghatwary (2006), Khattak *et al.* (2006), and El-Mazraawi (2007).

Influence of macro- and micro elements on the onion thrips nymphs:-

The obtained data in Table (4) indicated that, the initial reduction (one day after treatment) were the highest percentage caused by the micro elements Born or Manganese treatments (72.8 and 76.5%) or (71.0 and 71.3%) followed by Zinc (52.3 and 39.8%) during the two successive seasons 2008 and 2009, respectively. While, the macro element Potassium exhibited the lowest initial reduction (26.5 and 25.1%) during the two seasons, respectively.

Data illustrated in Table (5) showed the same trend but with the lowest percentage of reduction of *T. tabaci* nymph population after four days from treatments in the two successive seasons 2008 and 2009.

Table (4): Influence of different macro and micro elements on the percentage of reduction of *T. tabaci* population after one day from treatments (spraying)

Element	Rate of application	The percentage of reduction	
		2007/08	2008/09
Potassium	2.5 g./L.	26.5 c	25.1 c
Manganese	2.5 g./L.	71.0 a	71.3 a
Born	3.0 g./L.	72.8 a	76.5 a
Zinc	1.5 g./L.	52.3 b	39.8 b

Values labelled with the same letters in column are not significantly different at the 1% level of probability (One way ANOVA).

Table (5): Influence of different macro and micro elements on the percentage of reduction of *T. tabaci* population after four day from treatments (spraying)

Element	Rate of application	The percentage of reduction	
		2007/08	2008/09
Potassium	2.5 g./L.	40.3 c	34.2 c
Manganese	2.5 g./L.	76.4 a	74.2 a
Born	3.0 g./L.	76.6 a	75.7 a
Zinc	1.5 g./L.	45.3 b	48.4 b

Values labelled with the same letters in column are not significantly different at the 1% level of probability(One way ANOVA).

Data arranged in Table (6) showed that, the percentage of reduction of *T. tabaci* nymphs after one week of treatments with high percentage for both macro and micro elements during the two seasons of study.

Table (6): Influence of different macro and micro elements on the percentage of reduction of *T. tabaci* population after one week from treatments (spraying)

Element	Rate of application	The percentage of reduction	
		2007/08	2008/09
Potassium	2.5 g./L.	14.8 c	15.4 c
Manganese	2.5 g./L.	25.5 a	29.4 a
Born	3.0 g./L.	28.1 a	26.7 a
Zinc	1.5 g./L.	20.3 b	19.4 b

Values labelled with the same letters in column are not significantly different at the 1% level of probability(One way ANOVA).

Data represented in Tables (7 and 8) showed the same trend with the highest percentage of reduction of *T. tabaci* nymphs after two weeks of treatments followed by the percentage of reduction after three weeks of treatments in both seasons of the study.

As a conclusion, data represented in Tables 4-8 indicated that, the micro-element Born was the highest effeciancy (the highest percentage of reduction) with (72.8 and 76.5%), 76.6 and 75.7%), (28.1 and 26.7%), (37.5 and 46.6%), and (57.4 and 60.3%) followed by managanese (71.0 and 71.3%), (76.4 and 74.2%), (25.5 and 29.4%), (36.2 and 45.7%), and (54.7

and 55.1%) with no significant differences after one day, four days, one week, two weeks and three weeks from treatments in the two successive seasons (2008 and 2009), respectively.

Table (7): Influence of different macro and micro elements on the percentage of reduction of *T. tabaci* population after two week from treatments (spraying)

Element	Rate of application	The percentage of reduction	
		2007/08	2008/09
Potassium	2.5 g./L.	17.7 c	16.0 c
Manganese	2.5 g./L.	54.7 a	55.1 a
Born	3.0 g./L.	57.4 a	60.3 a
Zinc	1.5 g./L.	33.8 b	38.8 b

Values labelled with the same letters in column are not significantly different at the 1% level of probability (One way ANOVA).

On the other hand, micro element Zinc gave the intermediate percentage of reduction of *T. tabaci* nymphs during the two seasons of study. Moreover, the macro element Potassium exhibited the lowest percentage of reduction or the lowest effeciancy. Highly significant differences ($P<0.01$) were recorded between the different macro and micro elements during the two successive seasons. These results are in agreement with those of Metwally and Gabr (1997) in Egypt, Goncalves *et al.* (2004) and El-Shrif (2009) in Egypt.

Table (8): Influence of different micro element on the percentage of reduction of *T. tabaci* population after three week from treatments (spraying)

Element	Rate of application	he percentage of reduction	
		2007/08	2008/09
Potassium	2.5 g./L.	24.1 c	32.2 c
Manganese	2.5 g./L.	36.2 a	45.7 a
Born	3.0 g./L.	37.5 a	46.6 a
Zinc	1.5 g./L.	29.3 b	38.6 b

Values labelled with the same letters in column are not significantly different at the 1% level of probability (One way ANOVA).

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تأثير المبيدات التقليدية وغير التقليدية و العناصر الكبري والصغري علي الكثافه العددية لتربس البصل تحت الظروف الحقلية

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**** معهد بحوث وقاية النباتات – مركز البحوث الزراعية – الدقى – الجيزة**

أجريت التجارب بمحطة البحوث بكلية الزراعة– جامعة المنصورة خلال موسمين متتاليين ٢٠٠٨/٢٠٠٩ وذلك لتقدير كفاءة المبيدات التقليدية وغير التقليدية وكذلك بعض العناصر الكبري والصغري علي حشرة تربس البصل.

ووجد ان المبيدات التقليدية (السومثيون) والمبيدات الغير تقليدية البيو فلاي والكبريت قد أظهرت كفاءة ضد حشرة تربس البصل وذلك بأعلي نسبة خفض في التعداد خلال موسمي الدراسة. ومن ناحية أخري وجد أن مبيد الرادينت وزيت الستراكس أظهرت كفاءة متوسطة ضد حوريات تربس البصل. علاوة علي ذلك وجد أن زيت فول الصويا وزيت بذور القطن أحدثت أقل نسبة نقص في التعداد بعد ثلاثة أو خمسة أو ثمانية أيام من المعاملة.

التحليل الاحصائي سجل اختلافات عالية المعنوية بين المبيدات التقليدية أو الغير تقليدية بعد ثلاثة أو خمسة أيام أو ثمانية أيام من المعاملة خلال موسمي الدراسة.

وجد أن من العناصر الصغري البورون كانت الأعلي كفاءة (الأعلي نسبة خفض في التعداد) بمعدل (٧٢.٨، ٧٦.٥%)، (٧٦.٦، ٧٥.٧%) ، (٢٨.١، ٢٦.٧) ، (٣٧.٥، ٤٦.٦%) ، (٥٧.٤، ٦٠.٣%) يليه المنجنيز (٧١.٠، ٧١.٣%) ،(٧٦.٤، ٧٤.٢%)، (٢٥.٥، ٢٩.٤%)، (٣٦.٢، ٤٥.٧%) ، (٥٤.٧، ٥٥.١%) بعد يوم واحد، أربعة أيام ، أسبوع واحد ، أسبوعين، ثلاثة أسابيع من المعاملة خلال موسمي الدراسة (٢٠٠٨، ٢٠٠٩)علي التوالي.

من ناحية أخري وجد أن عنصر الزنك من العناصر الصغري أعطي نسبة خفض متوسط في تعداد حوريات تربس البصل خلال موسمي الدراسة. علاوة علي ذلك عنصر البوتاسيوم أعطت أقل نسبة خفض في التعداد أو أقل كفاءة وقد وجد أن هناك إختلافات عالية المعنوية بين العناصر الكبري أو العناصر الصغري خلال موسمي الدراسة.

قام بتحكيم البحث

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