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POPULATION DYNAMICS AND SOME CHEMICAL CONTROL TACTICS OF *Thrips tabaci*, L. AND *Tetranychus urticae*, KOCH ON CUCUMBER PLANTS AND YIELDS.

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ABSTRACT

Field experiments were carried out at Saqqara village in Giza Governorate during two successive seasons, 2013 and 2014 to detect the suitable applications for controlling *Thrips tabaci*,L and *Tetranychus urticae*, Koch on cucumber plants and resultant yield and the population fluctuation of the two pests. The three tested treatments were Fenpyroximate 5% SC(acaricide) & Ethoxazole 5% SC(acaricide) with the recommended rate 50 cm and 25 cm / 100 liters, respectively, Thiamethoxam 25% WG(insecticide) & Imidacloprid 20% SC(insecticide) with the recommended rate 20 gram and 50 cm/ 100 liters, respectively and Chlorfenapyr 36% SC(insecticide and acaricide) with the recommended rate 25 cm / 100 liters compared with the untreated cucumber plants. Results indicated that the population dynamics of *T. urticae* during two successive seasons was concentrated between the period extended from the fourth to the seventh inspection. There were not significant differences between the population of *T. urticae* during the two successive seasons, 2013 and 2014.

Results and their statistical analysis showed clearly that all treatments significantly decreased the population density of two tested pests and increased the cucumber yield comparing with control treatment. Chlorfenapyr though proved to be superior in performance for management of *T. tabaci* and *T. urticae*, thus the third treatment could be used as alternate candidate for the management of these pests.

Data indicated that the highest cucumber fruit yield was obtained from cucumber plots treated with the third treatment (Chlorfenapyr) (184kg. no. of production/100 plants), followed by the first treatment (169 kg) and plots treated with the second treatment (158kg). The highest net return LE (11005 LE/ fed) was recorded in plots treated with third treatment, followed by first treatment (9800 LE/ fed), then the second treatment (8525 LE/ fed), with compared the income return from treatments and control, the highest income (4380 LE/ fed) was obtained from the third treatment (T3), then the lowest income (1900 LE/ fed) was recorded with plots treated by the second treatment (T2).

INTRODUCTION

Cucumber, *Cucumis sativus* L is the most important economic vegetable crops cultivated in Egypt (Hanafy *et al.*, 2014). *Thrips tabaci*, L. are a polyphagous that causes a serious damage on vegetables and ornamental plants all over the world (Murai, 2000). Nymphs and adults feed on green leaf tissue, causing direct damage by destroying epidermal cells (Koschier *et al.*, 2002) and transmit the tomato spotted wilt virus disease to several crops (Negaraja *et al.*, 2005). In the United States, Jacobson and Kennedy (2013) demonstrated that thelytokous populations of onion thrips also could transmit TSWV; however, populations varied in their ability to do so (range 0 to 45%).The pest status of onion thrips can be attributed to its polyphagous nature, high reproductive rate, short generation time, high survival of cryptic (nonfeeding prepupa and pupa) instars, ability to reproduce without mating (parthenogenesis), ability to transmit plant pathogens, and development of resistance to insecticides (Morse and Hoddle 2006, Diaz-Montano *et al.* 2011). Onion thrips is a native of the Mediterranean region but has become a major pest of agricultural crops throughout most of the world (Mound and Walker 1982, Mound 1997). Severe damage to various crops has been reported in Africa, Asia, Europe, North and South America, and Australasia (Mound 1997, Boateng *et al.* 2014).

Ghallab *et al.* (2011) carried that four cucumber varieties (*Cucumis sativus* L.), Xena, Sweet crunch, Nemsse and Zaeim were selected to study their sensitivity to piercing sap sucking pests infestation including the thrips, *T. tabaci* under field condition, all treatments were applied four times. On the contrary, *Thrips* sp. recorded the highest infestation in Xena cultivar. The two spotted spider mite *Tetranychus urticae* Koch cause serious damages to the infested cucumber and kidney bean plants leading to great reduction in both quantity and quality of the resultant yield (El-Saeidy *et al.*, 2012). The effect of shade nets (black, white nets and polyethylene sheet) on some environmental factors (temperature and relative humidity) and population flactuation of spider mites, T urticae, Whitefly, *Bemisia tabaci* (Gennadius), Thrips, *Frankliniella intonsa* (Trybom) and Aphids, *Aphis gossypii* (Glover) was conducted by Maklad *et al.* (2012).

The major greenhouse pests were *Thrips tabaci*, *Tetranychus cinnabarnus*, *Aphis gossypii* and *Trialeurodes vaporariorum* in cucumbers (Yasarakinci and Hincal, 1997). Abou-Taka and Zohdy (1990) recorded that the spider mites in Egypt are one of the most serious pests on vegetable plants. However, two pests were recorded on cucumber plants only, thrips and leaf miner (El-Habi *et al.*, 1999). The present work aims to detect the suitable applications for controlling *T. tabaci* and *T. urticae* on cucumber plants and the population fluctuation of the two pests during two successive seasons, 2013 and 2014. Also, it was detected the effect of management of the two pests on economic aspects of cucumber yields.

MATERIALS AND METHODS

Two experiments were carried out under field conditions at Saqqara village in Giza governorate on cucumber plant; the first was conducted to study the

population fluctuation of *Thrips tabaci* and *Tetranychus urticae* on cucumber plant during two successive seasons, summer 2013 & 2014 and nile, 2013 & 2014. The second once was evaluated their efficiency of four treatments in reducing the population density of *Thrips tabaci* and *Tetranychus urticae* on cucumber plants. The first three treatments by applying recommended pesticides at different times of plant growth as Fenpyroximate 5% SC (acaricide) & Ethoxazole 5% SC (acaricide) with the recommended rate 50 cm and 25 cm / 100 liters, respectively, Thiamethoxam 25% WG (insecticide) & Imidacloprid 20% SC (insecticide) with the recommended rate 20 gram and 50 cm/ 100 liters, respectively and Chlorfenapyr 36% SC (insecticide and acaricide) with the recommended rate 25 cm / 100 liters and the fourth treatment was untreated check as in Table (1). In both studied seasons, the first experimental area was about 1050 m^2 cultivated with cucumber plant (Medina variety) at 29th April during summer season 2013 & 2014 and 17th June during nile season 2013 & 2014. The whole area was divided into 3 plots (each plot was 350 m^2). All plots were distributed in a randomized complete block design. In the second experiment, an area, was about 1050 cultivated with cucumber plant (Medina variety) 17th June during early nile season 2014, was divided into 12 plots (each plot was 87.50 m^2). Each treatment was replicated three times.

Samplings of 20 leaves of cucumber plants started at 15 days after planting were weekly randomly taken from each plot until the end of experiments, and kept in a tight closed paper bags and transported to laboratory, in where, all samples were thoroughly examined by stereomicroscope to count the adults and nymphs of *T. tabaci* and mobile stages of *T urticae*. In the second experiment, the fruit production per 100 plants was assessed for 10 inspections starting on 27th July 2014 with 3 days interval. At each date, 100 plants/ treatment (25 plants/ replicate) were randomly selected from each treatment. All the usual agricultural practices were followed except for keeping the whole area free from any other insecticidal treatments.

Table (1): Time of insecticide applications.

Treatment	Application time
T1	Spraying of Fenpyroximate (Ortus 5% SC) and Ethoxazole (Barrok 10% SC) at July, 8th, 2014 to August, 07th, 2014 with 10 days intervals between sprays (4 times of subsequently successive applications).
T2	Spraying of Thiamethoxam (Actra 25% WG) and Imidacloprid (Confidor 20% SC) at July, 15th, 2014 to August, 14th, 2014 with 10 days intervals between sprays (4 times of subsequently successive applications).
T3	Spraying of Chlorfenapyr (Challenger 36% SC) at July, 8th, 2014 to August, 07th, 2014 with 10 days intervals between sprays (4 times of subsequently successive applications).
Control	Untreated check.

Gross returns were based on yield harvested from each treatment in this experiment; the value of cucumber production was calculated based on the pound average price per kg of cucumber fruit (LE).

Gross return was calculated by the equation:

Cucumber fruits weight (kg)/ Fed. =Average production of plant (kg)× plant numbers of fed.

Net return LE/ Fed. = Cucumber fruits return LE / Fed. - Cost of treatments LE

Cucumber fruits return = Cucumber fruits weight (kg)/Fed.× Price of kg of cucumber fruit.

Cost of treatments LE= Number of sprays × cost of each application.

Cost of agriculture practices = Cost of Agriculture + Seeds + Irrigation + Fertilization

Cost of net applications= Cost of insecticidal treatments + Cost of agriculture practices

The statistical analyses of the present data were carried out using SAS program computer including f-test and L.S.D. value (SAS Institute, 2003).

RESULTS AND DISCUSSION

1. Population dynamics of *Thrips tabaci* and *Tetranychus urticae* on cucumber plants during summer seasons, 2013 and 2014.

Thrips tabaci and *Tetranychus urticae* remained an important pests on cucumber plants during the growing seasons, 2013 and 2014. *Thrips tabaci* was first observed on the first inspection at May, 14th (Table, 2). Data indicated that the cucumber plants (Medina variety) had two peaks of *T. tabaci* adults and nymphs at the dates of June, 04th and June, 25th during summer, 2013&2014. The population density increased from 2.7 to 25.3 and 8.7 to 31.3 thrips/ leaf at May, 14th to June, 04th, 2013 and 2014, respectively. Afterword, the population density abruptly decreased to reach 7.3 and 15.3/leaf during summer 2013 and 2014, respectively (Table, 2). The highest peaks were recorded25.3 and 31.3 individuals/leaf at the fourth inspection(June, 04th) during summer seasons, 2013 and 2014 respectively.

As soon as in thrips, two peaks was noticed during studied summer seasons, 2013 and 2014 (Table, 2).While, the population dynamics of *T. urticae* individuals recorded three peaks in the two seasons on cucumber plants. Peaks of the population recorded 35.7, 58.0 and 25.3 individuals/ leaf at the dates of May, 28th ,June, 18th and July, 16th 2013 in the first season, respectively. In the second season showed these peaks estimated at dates of June, 11th , June, 25th and July, 09th 2014 with the mean numbers of 53.3, 59.7 and 38.3 individuals/ leaf, respectively. The population density of *T. urticae* was ranged from 4 to 58 and 14.3 to 59.7 adults/ leaf during summer seasons, 2013 and 2014, respectively. The highest peaks were recorded 58.0 and 59.7 individuals/ leaf at June, 18th, 2013 and June, 25th, 2014, respectively (Table, 2)

Table(2):Weekly mean no. of *Thrips tabaci* and *Tetranychus urticae* individuals/ leaf on cucumber plants during summer seasons, 2013 and 2014.

Inspection date	Mean no. of *Thrips tabaci*/ leaf		Mean no. of *Tetranychus urticaae*/ leaf	
	2013	2014	2013	2014
May, 14th	2.7	8.7	4.0	14.3
21st	16	21	22.6	23.7
28th	18.3	23.7	35.7	37.7
June, 04th	25.3	31.3	34.3	48
11th	23.3	25	49.7	53.3
18th	16.6	21.3	58	45.7
25th	18	23	39.7	59.7
July, 02nd	8.6	18.7	33.7	37
09th	7.3	17.3	24.7	38.3
16th	7.3	15.3	25.3	27.6
Mean ± SE	14.34 ±2.37 [b]	20.53 ± 1.93 [a]	32.77 ± 4.76 [a]	38.53 ± 4.40 [a]
F value	10.40		2.43	
LSD	3.704		7.408	

2.Population dynamics of *Thrips tabaci* and *Tetranychus urticae* on cucumber plants during nile seasons, 2013 and 1014.

Presented data indicated that the population density of *T. tabaci* was highly concentrated on the last fivth and fourth inspections during nile seasons, 2013 and 2014 respectively (Table, 3).The populations of *T. tabaci* individuals recorded two peaks (18.7 and 35.3 individuals/ leaf) at July, 23rd and August, 20th 2013. In the second season 2014 the population of *T. tabaci* individuals recorded two peaks at the dates July, 30th and Agust, 13th with mean numbers of 19.3 and 29.7 individuals/ leaf, respectively. The highest peaks were observed during nile seasons, 2013& 2014 being 35.3& 29.7 thrips/ leaf, respectively. The *T. tabaci* infestations on cucumber plants were ranged between 2.7 - 35.3 and 1.7 - 29.7 thrips/ leaf during nile seasons, 2013& 2014, respectively (Table, 3).

In case of spider mite, *T. urticae*, the population dynamics was recorded two peaks during nile seasons, 2013 and 2014 being 54.3&55.7 individuals/ leaf at July, 23rd & August, 06th 2013, recpectively. In the second season recorded 65.7&57.7 individuals/ leaf, at July 23rd & August, 13th 2014 respect.. The population of *T. urticae* was distributed during the months of the growing nile seasons, 2013 and 2014 (Table, 3).

Table(3):Weekly mean no. of *Thrips tabaci* and *Tetranychus urticae* individuals/ leaf on cucumber plant during nile seasons, 2013 and 2014..

Inspection date	Mean no. of *Thrips tabaci*/ leaf		Mean no. of *Tetranychus urticaae*/ leaf	
	2013	2014	2013	2014
July, 02nd	3.3	1.7	18.7	12.3
09th	7.7	5.7	33.3	37.3
16th	6.7	15.3	35.7	41.7
23rd	18.7	16.7	54.3	65.7
30th	13.3	19.3	49	63
August, 06th	27.3	16.3	55.7	52.3
13th	31.3	29.7	53	57.7
20th	35.3	26.3	45.7	51.3
27th	30.7	25.7	31.7	44.3
September, 03rd	25	19.3	30.7	41.3
Mean ± SE	19.93 ± 3.67 [a]	17.6 ± 2.78 [a]	40.78 ± 3.95 [a]	46.69 ± 4.87 [a]
F value	0.80		3.00	
LSD	5.233		7.242	

In general, the general mean number of *T. tabaci* was significantly differences between 2013 and 2014 during summer being 14.34 and 20.53 thrips/ leaf, respectively. However, it was not significant during nile 2013 and 2014. Also, There were not significant differences between the population of *T. urticae* during two successive seasons, summer and nile, 2013 and 2014 (Table, 2& 3 and Fig. 1). Data in Fig. (1) showed that the infestation of *T. urticae* was higher than the infestation of *T. tabaci* during two studied seasons 2013 and 2014. Similarly, Gallab *et al.* (2011) stated that the four cucumber varieties, *cucumis sativus* were sensitivity to piercing sap sucking pests' infestation including the onion thrips, *T. tabaci* and two spotted spider mite, *T. urticae* under field conditions. However, Maklad *et al.* (2012) studied the effect of shade nets on some environmental factors on the population fluctuation of *T. urticae*, *Frankiniella intonsa*, *B. tabaci*

and *A. gossypii*. The hot and dry weather can lead to an increase in *T. tabaci* and *T. urticae* populations and the severity of the thrips and the two spotted spider mite to cucumber plants. The season behind this is likely a combination of factors including a shorter generation time and a reduction in mortality from abnormal condition and plant pathogens.

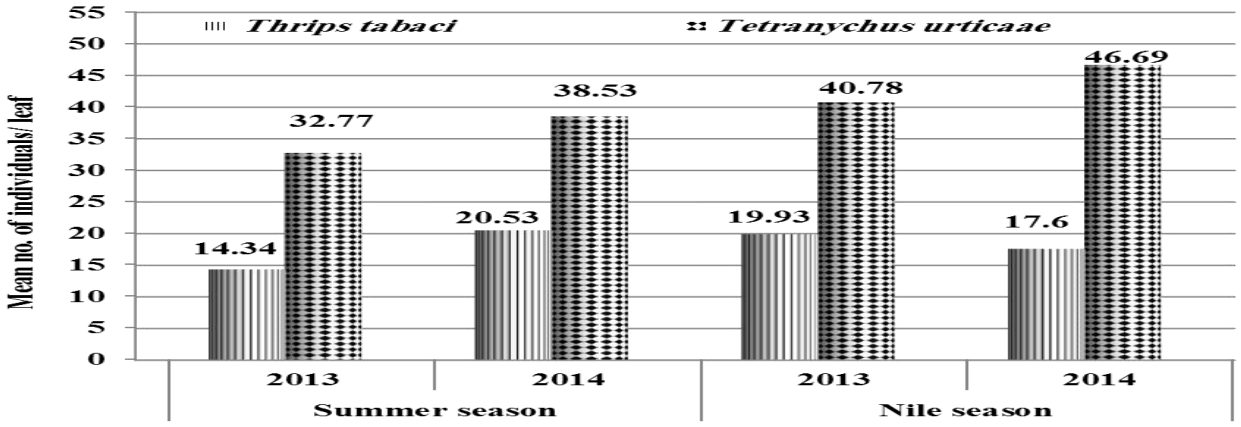

Fig. (1): Comparison between the infestation of *Thrips tabaci* and *Tetranychus urticae* on cucumber plant during two successive seasons, summer 2013 & 2014 and nile, 2013 & 2014.

3. Effect of chemical treatments on *Thrips tabaci* and *Tetranychus urticae* on cucumber plants.

***Thrips tabaci*:**

Date tabulated in Table (4) showed that the lower the counting of *T. tabaci* the better is the insecticidal application. Obtained data showed that on the mean number of thrips/ leaf after these applications showed that minimum population (mean no. of thrips/ leaf) was in plots treated with Challenger 36% SC (Chlorfenapyr) (1.32), Actra 25% WG (Thiamethoxam) & Confidor 20% SC (Imidacloprid) (3.37). The highest populations of 16.62 mean no. of thrips/leaf was recorded in plots treated with Ortus 5% SC (Fenpyroximate) & Barrok 10% SC (Ethoxazole) but this treatment was significantly lower than the control plots (21.11). In all three sprays, Chlorfenapyr was more effective than other insecticides. Our results are comparable with those of Ullah *et al.* (2010) who reported Confidor is the most efficient insecticide and can trustfully be incorporated into the management of this pest. However, the non-effectiveness of Actra against *T. tabaci* was reported by Razzaq *et al.* (2003).

Table(4):Comparison between insecticide applications and(*Thrips tabaci* &*Tetranychus urticae*) populations.

Inspection dates	Mean no. of *Thrips tabaci*/leaf				Mean no. of *Tetranychus urticaae*/leaf			
	T1	T2	T3	Control	T1	T2	T3	Control
July, 02nd2014	2.7	2.3	3.3	3.7	14	17.3	13.3	16.7
09th	8.3	4.7	6.3	5.7	27	28.7	24.7	25.7
16th	5.7	16.3	0.3	10.3	3.3	45.3	1.3	38.3
23rd	9.7	0.7	0	19.7	0.7	36.7	0	47.7
30th	10.7	0	0	23.7	2.3	55.7	1.7	65.7
August, 06th	25.3	0.3	0	21.3	0.3	51.3	0	67
13th	31.7	0.7	0	35.7	0	53.3	0	58.3
20th	25.7	2.3	0	32	3.3	45.3	0.7	41.3
27th	24.7	3.7	2.3	31.7	11.7	38	5.3	35.7
September, 03rd	21.7	2.7	1	27.3	10.3	26.7	5.7	31.3
Mean± SE	16.62± 3.24 b	3.37± 1.52 c	1.32± 0.66 c	21.11± 3.57 a	7.29± 2.72 b	39.83± 4.01 a	5.27± 2.53 b	42.77± 5.33 a
F value	45.79				86.64			
LSD	4.031				6.081			

T1= Fenpyroximate (Ortus 5% SC)& Ethoxazole (Barrok 10% SC)
T2= Thiamethoxam (Actra 25% WG)& Imidacloprid (Confidor 20% SC)
T3= Chlorfenapyr (Challenger 36% SC)

***Tetranychus urticae*:**

Data presented in Table (4) revealed that the minimum of sbider mite, *T. urticae* populations in plots treated with Challenger 36% SC (Chlorfenapyr) (5.27) and Ortus 5% SC (Fenpyroximate) & Barrok 10% SC (Ethoxazole) (7.29). While, the highest population (39.83) was recorded for Actra 25% WG (Thiamethoxam) & Confidor 20%SC (Imidacloprid) treated plots but it was still significantly lower than the untreated plots (Control) (42.77). Chlorfenapyr, though proved to be superior in performance for management of the two spotted spider mite, *T. urticae*, thus the first treatment could be used as alternate candidate for the management of the pest. Observations are compatible with those AL-Antary *et al.* (2012) who reported that Chlorfenapyr induced very effective against *T. urticae*

population on cucumber. However, Hassan *et al.* (2007) stated that Vertemic (Abamectin) and Ortus (Fenpyroximate) was the best in reducing *T. urticae* population on cucumber.

4.Effect of different insecticidal treatments on cucumber yield.

Data recorded in Table (5) assured that the highest cucumber fruit yield was obtained from cucumber plots treated with the third treatment (Challenger 36% SC) (184kg. no. of production/100 plants), followed by the first treatment (169 kg) and plots treated with the second treatment (158kg). However, untreated plots ware received the lowest production of cucumber fruits being 135kg no. of fruit production/100 plants, there were significant difference between treatments.

With study the economic evaluation of all treatments, data tabulated in Table (6) showed that the net return of cucumber yields increased in the three insecticidal treatments when compared with untreated plants. The highest net return LE (11005 LE/ fed.) was recorded in plots treated with third treatment, followed by first treatment (9800 LE/ fed.), then the second treatment (8525 LE/ fed), with compared the income return from treatments and control, the highest income (4380 LE/ fed) was obtained from the third treatment (T3), then the lowest income (1900 LE/ fed) was recorded with plots treated by the second treatment (T2) (Table, 6).

Table (5): Comparison between insecticide applications and cucumber yields during summer season, 2014

Inspection dates	Production/100 plants			
	First treatment	Second treatment	Third treatment	Control
July, 27th 2014	15	12	13	10
30th	17	15	20	14
August,02nd	18	17	23	15
05th	20	18	23	18
08th	22	20	25	20
11th	21	21	22	16
14th	20	19	20	15
17th	15	17	17	13
20th	13	12	13	8
23rd	8	7	8	6
Total	169	158	184	135
Overall mean± SE	16.9 ± 1.35 ab	15.8 ± 1.37 ab	18.4 ± 1.74 a	13.5 ± 1.39 b
F value	1.97			
LSD	4.22			

Table(6):Economic aspects of insecticidal applications against *Thrips tabaci* & *Tetranychus urticae* populations for cucumber yields during summer season, 2014.

Treatment	Economic evaluations							
	Yield weight (Kg)/ 100 plant	Yield weight (Kg)/ Feddan	Yield return (LE)/ Feddan	Cost of insecticidal treatments LE/ Feddan	Cost of agriculture practices LE/ Feddan	Cost of net applications/ Feddan	Net return LE/ Feddan	Income return of treatments – Income from control
T1	169	16900	16900	225	6875	7100	9800	3175
T2	158	15800	15800	400		7275	8525	1900
T3	184	18400	18400	520		7395	11005	4380
Control	135	13500	13500	----		6875	6625	----

Kg price = 1 LE

Generally, it could be stated that cucumber plants treated with Challenger 36% SC to control *T. tabaci* and *T. urticae* altogether gave the highest yield and income net return (T3) followed by cucumber plants treated with Ortus 5% SC & Barrok 10% SC to control *T. urticae* (T1). On the other hand, cucumber plants treated with Actra 25% WG & Confidor 20%SC to control *T. tabaci* occupied the lowest income net return

Additionally, Tuzel *et al.* (2005) studied the yield net return of cucumber whereas compared between the conventional and organic agriculture. However, Pitan and Filani (2013) stated that cucumber yield was significantly higher by 50% in plots sprayed at post flowering over the control against main pests of cucumber in Nigeria. Also, Hussain *et al.* (1997) studied the economical of insecticidal applications for control *T. tabaci* on garlic plants. They showed that the net yield return increased in the four insecticide treatments when compared with untreated plants. Finally, the third application with used Challenger 36 % SC (Chlorfenapyr) was yielded the highest cucumber production during summer season, 2014.

REFERENCES

Abou-Taka, S. M. and Zohdy, S. (1990): Greenhouses study on the suitable releasing population of the predatory mite, *Amblyseius gossypii* against *Tetranychus urticae* infesting cucumber plants. Minufiya J. Agric. Res., 15:1937-1962.

Al-Antary, T.M.; Al-Lala, M.R. and Abdel-Wali, M.I. (2012): Residual effect of six acaricides on the two spotted spider mite (*Tetranychus urticae* Koch) females on cucumber under plastic house conditions in three upper land regions in Jordan. Advanced in Environmental Biology, 6(11): 2992-2997.

Boateng, C. O.; Schwartz,H. F.; Havey, M. J. and Otto, K. (2014): Evaluation of onion germplasm for resistance to Iris Yellow Spot Virus (Iris yellow spot virus) and onion thrips, *Thrips tabaci*. Southwest. Entomol., 39: 237–260.

Diaz-Montano, J.; Fuchs,M.; Nault,B. A.; Fail, J. and Shelton, A. M. (2011): Onion thrips (Thysanoptera: Thripidae): A global pest of increasing concern in onion. J. Econ. Entomol., 104: 1–13.

El-Habi, M.; El-Jadd, L.; Sekkat, A. and Boumezzough, A. (1999): Population dynamic of *Aphis gossypii* on cucumber under glass in the coastal areas of Morocco. Insect Science and its Application, 19: 17-22.

El-Saeidy, E.M.A.; Abou-Zaid, A.M.M. and Maklad, A.M.H. (2012). Evaluation of the susceptibility of two kidney bean cultivars to the infestation of the two-spotted spider mite and some sap-sucking insects and their relations with some abiotic factors. Journal of Applied Science Research, 8(11): 5543-5543.

Ghallab, M.M.; Habashi, N.H.; Iskandar, A.K.F. and Rizke, M.A. (2011): Sensitivity of four cucumber cultivars to some piercing sap sucking pests infestation and their impact on yield. Egyptian Journal of Agricultural Research, 89 (4): 1363-1371.

Hanafy, A.R.I.; Baiomy, F. and Tantawy, M.A.M. (2014): Comparison between the infestation rate of certain pests on cucumber and kidney bean and its relation with abiotic factors and anatomical characters. Egyptian Academic Journal of Biological Science, 7(2): 63- 76.

Hassan, M.F.; Ali, F.S.; Hussein, A.M. and Mahgob, M.H. (2007): Control measures of *Tetranychus urticae* Koch on two cucumber cultivars in plastic houses Acarines, 1(1): 11-15.

Hussain, T., Iqbal, M., ullah, F. and Anwar, M. (1997): Population trends, varietal preference and chemical control of garlic thrips (Thrips tabaci L.). Sarhad J. Agric., 13: 175-180.

Jacobson, A. and Kennedy, G. G. (2013): Specific insect-virus interactions are responsible for variation in competency of different *Thrips tabaci* isolines to transmit different tomato spotted wilt virus isolates. PLOS ONE 8: e54567.

Koschier, E.H.; Sedy, K.A. and Novak, J. (2002): Influence of plant volatiles on feeding damage caused by the onion thrips, *Thrips tabaci*. Crop Protection, 21: 419-425.

Maklad, A. M. H.; Abolmaaty, S.M.; Hassanein, M.K. and Abd El-Ghafar, N. Y. (2012): Impact of Type of Greenhouse Cover Sheets on Certain Major Cucumber Pests under Protected Cultivation. New York Science Journal, 5(7): 19-24.

Morse, J.G. and Hoddle, M. S. (2006): Invasion biology of thrips. Ann. Rev. Entomol. 51: 67–89.

Mound, L. A. (1997): Biological diversity, pp. 197–215. In T. Lewis (ed.), Thrips as crop pests. CAB International, New York, NY.

Mound, L. A., and Walker, A. K. (1982): Terebrantia (Insecta: Thysanoptera). Fauna of New Zealand No. 1. DSIR,Wellington, New Zealand.

Murai, T. (2000): Effect of temperature on development and reproduction of onion thrips, *Thrips tabaci* Lindeman (Thysanoptera: Thripidae), on pollen and honey solution. Applied Entomology and Zoology, 35: 499-504.

Nagaraja, R.; Venugopal, R.; Murthy, K.V.K. and Jagadish, K.S. (2005): Evaluation of groundnut genotypes against peanut Bud Necrosis Virus (PBNV) and its thrips vector at Bangalore. Environment and Ecology, 23 (SP1-1): 118-120.

Pitan, O.O.K. and Fibani, C.O. (2013): Assessment of insect spectrum and insect induced damage at different growth stages of cucumber (*Cucumis sativus* L.) in a rainforest transition zone of Nigeria. Annals of tropical Research, 35(2): 60-68.

Razzaq, M.; Aslam, M.; Iqbal, M.; Hussain, M. and Shehzad, A. (2003): Efficacy of six insecticides with different mode of action against pests of cotton. Sarhad J. Agric., 19: 97-99.

SAS Institute (2003): SAS version 9.1. SAS Institute Inc, Cary, NC, USA.

Tuzel, Y.; Gul, A.; Tuncay, O.; Anac, D.; Madalar, N.; Yoldas, Z.; Gumus, M.; Tuzel, I.H. and Engindeniz, S. (2005): Organic cucumber production in the green house: A case study from Turkey. Renewable Agriculture & Food system, 20(4): 206-613.

Ullah, F.; Mulk, M.; Farid, A.; Saeed, M.Q. and Sattar, S. (2010): Population dynamics and chemical control of onion thrips (*Thrips tabaci*, Lindemann). Pakistan J. Zool., 42(4): 401-406.

Yasarakinci, N. and Hincal, P. (1997): Determining the pests and beneficial spices and their population densities on tomato, cucumber, pepper and lettuce greenhouse in Izmir. Bitki Koruma Bulltin, 37: 79-89.

ديناميكيات التعداد وبعض طرق المكافحة الكيميائية لكل من تربس البصل واكاروس العنكبوت الاحمر على نباتات الخيار وانتاجية المحصول

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أجريت تجارب حقلية في قرية سقارة بمحافظة الجيزة خلال موسمين متتاليين ٢٠١٣ و ٢٠١٤ لدراسة التذبذب العددى لحشرة التربس *T. tabaci* ، والعنكبوت الأحمر *T. urticae* و طرق مكافحتهم على نباتات الخيار والمحصول الناتج.

وقد تم إختبار كفاءة ثلاث معاملات لمكافحة حشرة التربس *T. tabaci* ، والعنكبوت الأحمر *T. urticae* بالمعدلات الموصى بها وهى

١- أورتس ٥ % SC وباروك ١٠% SC (مبيدات اكاروسية) بمعدل ٥سم و٢٥سم/١٠٠ لتر ماء على التوالى (٤ رشات بفارق كل ١٠ ايام رشة واحدة بالتبادل بين المركبين).

٢- أكتارا ٢٥% WG و كونفيدور ٢٠% SC (مبيدات حشرية) بمعدل ٢٠ جم و ٥٠سم/ ١٠٠ لتر ماء على التوالى (٤ رشات بفارق كل ١٠ ايام رشة واحدة بالتبادل بين المركبين).

٣- شالنجر ٣٦% SC (مبيد حشرى واكاروسى) بمعدل ٢٥سم/ ١٠٠لتر ماء (٤ رشات بفارق كل ١٠ ايام رشة واحدة)

وأشارت النتائج ان ديناميكيات التعداد للعنكبوت الاحمر خلال موسمى الدراسة تركزت بين الفحصة الرابعة والسابعة ولم يكن هناك اختلافات كبيرة بين التعداد خلال الموسمين. كما اشارت نتائج التحليل الاحصائى عدم وجود اختلافات بين الموسمين ٢٠١٣ و٢٠١٤ وذلك للعنكبوت الاحمر خلال العروتين الصيفى والنيلى اما فى حالة حشرة التربس فكانت هناك اختلافات بين الموسمين وذلك فى العروة الصيفية فقط.

وأظهرت نتائج التحليل الاحصائى بشكل واضح ان جميع المركبات المختبرة أدت الى خفض التعداد للافتين محل الدراسة مع ارتفاع العائد من محصول الخيار مقارنة بالكنترول مع وجود اختلافات بين المعاملات وبعضها البعض فى الانتاجية وبالتالى العائد الاقتصادى حيث اشارت النتائج ان اعلى محصول خيار كانت للمعاملة الثالثة وبالتالى اعطت اعلى فرق عائد مقارنة بالكنترول (٤٣٨٠ جنيه/ فدان) تليها المعاملة الاولى (٣١٧٥ جنيه/فدان) واخيرا المعاملة الثانية (١٩٠٠ جنيه/فدان).

واخيرا يمكن القول ان استخداام مركبات لمكافحة الافتين معا اعطت افضل النتائج يليها استخدام مركبات لمكافحة االعنكبوت الاحمر فقط ثم استخدام مركبات لمكافحة تربس البصل فقط كل على حده.