

**EFFECTS OF CERTAIN INSECTICIDES ON SOME
PIERCING SUCKING PESTS AND THEIR NATURAL
ENEMIES ON TOMATO PLANTS**

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ABSTRACT : A field experiment was carried out in Sharkia governorate during early summer plantation, 2002 to study the effect of three different pesticides i.e., Carbosulfan 20 % Sc. at two rates, 100 ml./100 L. water (recommended rate) and 1/2 of the recommended rate ,Biofly (a biocide) and Naterlo (natural oil) 97% on certain piercing sucking pests, *Bemisia tabaci* (Gennadius), *Aphis gossypii* (Glover), and *Tetranychus urtica* (Koch) infesting tomato plants. The relation between these pests, their natural enemies and virus symptoms were studied.

The results indicated that the efficiency of the tested pesticides after the second spray was very obvious compared with that of the first spray. The percent reduction in population densities of the target pests increased significantly after the second spray. Carbosulfan at the recommended rate was the most effective compound against the pests and their natural enemies.

On contrary, Biofly and Naterlo biocides achieved a considerable reduction in population densities of the tested pests. Such natural products are considered a group of the most promising control agents whereas they can preserve the beneficial entomofuna and reduce the risk of contamination of human food.

Key words: Efficiency, piercing sucking pests, carbosulfan 20%Sc., Naterlo natural oil 97%, *B. tabaci*, *A. gossypii*, *T. urtica*.

INTRODUCTION

Tomato whitefly, *Bemisia tabaci* (Gennadius) have been very difficult to control with conventional insecticides (Rusmussen 1994). Therefore, pest control by non conventional methods is very important especially in the early of season because the decimation of beneficial organisms is very danger. In order to avoid the early use of pesticides and their subsequent effects on natural enemies, it was necessary to control whitefly and other pests on tomato plants (*Lycopersicon esculentum* L.) by non chemical insecticides at the beginning of the season. The causes of plant disorders and irregular ripening associated with feeding of the whitefly be controlled with natural products. Damage of whitefly is not only direct sucking the plant sap, but also indirect due to transmission of tomato yellow leaf curl virus

(TYLCV). The present work aimed to find out the proper rate of pesticides to control whitefly and other piercing sucking pests, minimize virus infection and decrease the pesticide contamination.

MATERIALS AND METHODS

Field experiment was carried out during early Summer Plantation 2002 at El-Zarkia village, Zagazig, Sharkia. An area of quarter feddan was divided into twenty plots. The experiment was laid out in randomized block design, each plot was about 1/100 feddan (42 m²) replicated four times. Tomato seedlings (variety U.C. 97-3) were transplanted in 1/4/2002. All treatments received the normal agronomic practices as followed in the area. The pesticides used were as follows:

- 1) Biofly is a liquid biological formulated contain spores of the fungi, *Beauveria bassiana* 3×10^7 conidia/ml. It was applied at the rate of 100 ml/100 liters of water (L.W.). It was provided by Naser fertilizer and biocides Co., El-Sadat city, Egypt.
- 2) Naterlo (Natural oil) 97 %. It is a blend of vegetable oil; emulsifiers and antioxidant. It contains 93 % pure vegetable oil and was applied at the rate of 625 ml/100 liters water. It was provided by STOLLER Chemical Company, U.S.A.
- 3) Marshal (carbosulfan) 20 % Sc. at the recommended rate (1R) 100 ml/100 L.W. and $\frac{1}{2}$ R. Spraying started at 19/4/2002 at early morning. Each compound was sprayed twice at 7 days interval. A knapsack sprayer provided with one nozzle was used. Randomized samples were taken directly before and after spraying at 1, 3, 5 and 7 days according to the protocol of Ministry of the Agriculture. Ten leaves from each plot were taken randomly and kept in paper bags and examined immediately by using a binocular microscope in the laboratory of Plant Protection Institute. The study aimed to evaluate the efficiency of the tested compounds for certain piercing sucking pests, i.e. *B. tabaci*, *Aphis gossypii*, *Tetranychus urtica* and the more abundance natural enemies. Tomato plants were planted adjacent to wheat of three sides. Tomato plants showed the tomato yellow leaf curl virus (TYLCV) symptoms were counted according to Yassin and Nour (1965). Assessment was carried out by examining 25 plant / plot (100 plants / treatment) and recording the number of infected plants after 30 and 60 days of transplanting. The percent reduction in infestation were calculated according to Henderson and Telton (1955) equation. All data were analyzed using analysis of variance. Means were separated by Duncan's multiple range test (1955).

RESULTS AND DISCUSSION

1. Efficacy on *B. tabaci*

The initial and residual activity of two sprays of Biofly , Naterlo and Marshal pesticides against whitefly, *B. tabaci* infesting tomato plants are tabulated in Table (1):

Data indicated that after the 1st spray no significant differences were recorded between the tested materials. Marshal (1 R) and Naterlo achieved highest initial reduction reached on egg population 58.03 and 57.82 %, respectively. Biofly caused lower initial reduction in eggs population (32.71 %). Concerning the residual effect (3rd till 7th day after spray): data in the same table indicated that the sprayed bio fly *B. bassiana* was achieved satisfactory residual activity reached, (81.01%)' indicating better performance than that of Marshal (1 R) (70.54 %).

Data of the 2nd spray revealed that Marshal when used at (1R) showed superior initial reduction in population among the other

tested compounds. It caused excellent control (55.90 %).

Data also showed that, *B. bassiana* when applied twice achieved more or less-good control against eggs infestation on tomato plants. It caused relatively high residual activity, being 57.62% reduction in population of *B. tabaci* eggs. Naterlo showed moderate residual effect, revealing 71.86% reduction in egg numbers of whitefly after the same period . Our results are in harmony with that obtained by Issa *et al.*, (1995), who reported that the mean of % reduction in eggs infestation of six sprays by Naturalis (L) at rate 100 ml/100 L.W. was 41.95 % reduction. On the contrary, our data on *B. bassiana* and Naterlo treatment on tomato are in contradiction with that reported by Metwally Samia *et al.*, (1999) on squash at Qalyoubia. They cited that Naturalis and Naterlo at the same rates were induced mean reduction 94.21% and 96.52% in infestation of the egg stage after 7 days from spray . The same compounds when used at

Table (1). Percent reduction in infestation with egg stage of *Bemisia tabaci* on tomato plants treated with Biofly, Naterlo and Marshal at El-Zarkia, Sharkia governorate during early summer plantation (2002).

Treatments	Rate /100 L. water	Percent reduction in infestation with the egg stage of whitefly, <i>B. tabaci</i> at the indicated days after 1 st and 2 nd spray												General mean of the total effects
		First spray						Second spray						
		Days						Days						
		*(1)	3	5	7	**	General mean	*(1)	3	5	7	**	General mean	
Biofly	100 ml	32.71a	81.92ab	85.66a	75.64a	81.01a	68.94a	26.93ab	35.01bc	56.35a	81.51a	57.62a	49.95bc	59.45
Naterlo	625 ml	57.82a	86.92a	68.74a	12.24b	56.32ab	56.43a	49.64a	67.16ab	76.75a	71.67ab	71.86a	61.93ab	59.18
Marshal ½ R	50 ml	18.15a	49.20b	65.84a	28.15b	47.73b	40.34b	13.31b	13.82c	32.32b	28.72b	24.95b	22.04c	31.19
Marshal 1R	100 ml	58.03a	69.34ab	75.88a	66.39a	70.54ab	67.41a	55.9a	86.59a	73.89a	85.8a	82.09a	75.54a	71.48
Cont. No./ leaf		4.07	7.2	9.6	9.87			4.87	7.73	5.6	5.27			
L.S.D. 0.05 %		42.13	35.07	21.88	27.95	23.83	14.42	32.59	35.21	44.04	47.69	26.47	18.25	
Temperature c°		23.2	22.9	19.5	22.5			19.9	22.0	21.7	22.4			
R. humidity %		56.0	43.0	52.0	56.0			56.0	56.0	53.0	53.0			

Figures denoted by the same letter are statistically insignificant (at 5%) level.

*Mean of initial activity.

** Mean of residual activity (the effect from 3rd till 7th day after spray).

R = recommended rate.

½ R = Half recommended rate

Fayoum governorate induced % reduction 88.52 % and 92.30 % respectively.

As for the nymphal stages of whitefly infesting tomato, data in Table (2) indicated that, one day after the first spray of the pesticides tested, Naterlo and Marshal (1R) caused the highest initial reduction in infestation, being 77.6 % and 73.92 %. The other compounds showed unsatisfactory residual nymph control (3- 7 days after spray). The myco-insecticide caused 51.72% reduction in infestation compared with 64.11 % for Marshal (1 R). After the 2nd spray, they achieved 66.99 % and 74.14 % reduction respectively. This finding indicated good residual activity for *B. bassiana*. Accordingly, Naterlo proved the most effective treatment. It was induced good residual activity after 2nd spray with 59.48 % population reduction.

Our results are in agreement with those obtained by Metwally, Samia *et al.*, (1999) who reported that the natural oil at 625 ml /100 L.W. gave

excellent initial kill against the immature stages of the whitefly at Qalyoubia.

As for Biofly performance, our results are in agreement with those obtained by Issa *et al.*, (1995). The same trend of results is in accordance with that obtained by Abd-Allah (1999), who reported that, carbosulfan (Marshal 25 % w.p) at 150 g.a.i./Fed., gave excellent control till five days after application with, *B. bassiana* resulted in acceptable control to the insect nymphs till the seventh day after, application when applied at 3ml./ L.

Data in Table (3) summarized the effectiveness of Biofly, Naterlo and Marshal 20 % Sc against immature stages of whitefly, *B. tabaci* (Genn.), virus infection symptoms and their associated natural enemies under field condition. All compounds tested reduced the number of immature stages of *B. tabaci* below the number in the untreated plants without affecting on population of natural enemies except Marshal

Table (2): Percent reduction in infestation with nymphal stage of *Bemisia tabaci* on tomato plants treated with Biofly, Naterlo and Marshal at El-Zarkia, Sharkia governorate during early summer plantation (2002).

Treatments	Rate /100 L. water	Percent reduction in infestation with the nymphal stage of whitefly, <i>B. tabaci</i> at the indicated days after 1 st and 2 nd spray												General mean of the total effects
		First spray						Second spray						
		Days						Days						
		*(1)	3	5	7	**	General mean	*(1)	3	5	7	**	General mean	
Biofly	100 ml	34.0b	44.85a	50.51a	59.81a	51.72a	47.29	40.51bc	58.48ab	65.86b	76.62a	66.99a	60.37a	53.83
Naterlo	625 ml	77.6a	46.14a	41.80a	37.63a	38.52a	48.29	66.62a	73.05a	58.01ab	47.58bc	59.48ab	61.27a	54.78
Marshal ½ R	50 ml	14.78b	32.13a	25.22a	35.39a	30.91a	26.88	27.38c	39.48b	50.12a	34.18c	41.26c	37.79b	32.34
Marshal 1R	100 ml	73.92a	95.94a	47.25a	49.15a	64.11a	66.57	59.29ab	71.46a	77.07ab	73.9ab	74.14a	70.43a	70.43
Cont. No./ leaf		4.53	9.33	5.6	8.73			4.13	5.73	8.0	6.13			
L.S.D. 0.05 %		32.29	52.66	45.16	32.39	37.21		28.0	22.94	22.13	27.71	18.16	10.48	

Figures denoted by the same letter are statistically insignificant (at 5%) level.

*Mean of initial activity.

** Mean of residual activity (the effect from 3rd till 7th day after spray).

R = recommended rate.

½ R = Half recommended rate

Table (3). The effects of two pesticidal sprays on the reduction percentages of *B. tabaci* (Genn.) and its relation with both of the percent TYLCV infection & the natural enemies on Tomato plants.

Treatments	Rate/100 L. water	Name of predator	Days after treatments										% infestation by TYLCV symptoms after		
			First application					Second application					30 days	60 days	Mean
			Zero time	20 / 4	22 / 4	24 / 4	26 / 4	27 / 4	29 / 4	1 / 5	3 / 5				
Biofly	100 ml	<i>Chrysoperla carnea</i>	5	3	4	4	5	4	3	6	5	12.22	15.11	13.67%	
		<i>Coccinella undecimpunctata</i>	3	1	2	2	3	2	5	3	4				
		<i>Orius spp</i>	5	2	2	3	2	3	6	4	6				
		Mummies	17	15	7	5	4	1	-	-	1				
				33.36	63.39	68.09	67.73	33.72	46.75	61.11	79.07				
Natercio	625 ml	<i>Chrysoperla carnea</i>	7	4	2	1	2	1	1	2	2	10.44	10.22	10.33%	
		<i>Coccinella undecimpunctata</i>	1	5	2	1	1	1	-	3	2				
		<i>Orius spp</i>	2	3	1	1	2	-	1	1	1				
		Mummies	19	15	6	4	6	1	1	2	4				
				67.71	66.53	55.27	24.94	39.13	70.11	67.38	59.53				
Marshal 20 % Sc. (1/2 R)	50 ml	<i>Chrysoperla carnea</i>	8	6	3	1	-	-	-	-	-	10.22	12.67	11.45%	
		<i>Coccinella undecimpunctata</i>	1	4	2	1	1	-	-	-	-				
		<i>Orius spp</i>	4	3	1	1	-	-	-	-	-				
		Mummies	17	10	5	2	1	-	-	-	-				
				16.47	40.67	45.53	31.77	58.13	26.65	41.22	31.45				
Marshal 20 % Sc. (1 R)	100 ml	<i>Chrysoperla carnea</i>	4	1	1	-	-	-	-	-	-	9.33	9.11	9.22%	
		<i>Coccinella undecimpunctata</i>	2	-	-	-	-	-	-	-	-				
		<i>Orius spp</i>	3	-	-	-	-	-	-	-	-				
		Mummies	16	17	-	-	-	-	-	-	-				
				65.98	82.64	61.56	57.77	57.6	79.03	75.46	79.85				
Untreated control	Water	<i>Chrysoperla carnea</i>	2	3	5	4	6	5	5	7	6	26.67	49.17	37.92%	
		<i>Coccinella undecimpunctata</i>	3	2	2	5	3	4	3	5	5				
		<i>Orius spp</i>	2	2	1	2	3	2	2	3	4				
		Mummies	18	17	17	19	16	14	19	20	26				
				45.33	64	82	93	45	67.33	68	57				

* Mean of % reduction in infestation at indicated day after spray on egg and nymphs stages of *B. tabaci* from Tables (1 and 2).

at the applied rate. The numbers of all predators under the experimental conditions were reduced specially after the 2nd spray and were reached zero when treated with Marshal. These result are in agreement with those obtained by El-Ghany *et al.* (1992). They reported that, population of two insects and predator species (*Chrysopa carnea* Steph., *Coccinella undecimpunctatu* Reich and *Syrphus* spp., were reduced in all treated plots.

As for the untreated plots, data indicated that the immature stages of whitefly densities were highest once at April, 26 inspection, showing 93 individual/leaf. The population of predators reached: *Chrysoperla carnea* (6 individual/leaf), *Coccinella undecimpunctata* (3 indi. / leaf), *Orius* spp. (3 indi. / leaf) and mummies (16 indi. / leaf). The highest population was recorded one at inspection of May, 3.

As general, data indicated that Biofly, *B. bassiana* achieved the best control of *B.*

tabaci without serious reduction in the population of natural enemies.

This result is in agreement with the findings of Emara *et al.*, (1999), they reported that, *Chrysopa carnea* and *Orius* spp. were highly susceptible to imidaclopride, thiocyclam, primiphosmethyl, fenobucarb, pyridaben, fenazaquin and pymetrozine while Biofly and Naturalis were the highly effective in the control of *B. tabaci* population without serious effect on natural enemies.

Concerning the effects of tested materials on tomato plants and virus symptoms (TYLCV) after 30 and 60 days from transplantation, the results indicated that, the tested compounds greatly reduced the tomato yellow leaf curl virus symptoms as a direct relation to the effective rate of pesticides against *B. tabaci*. transmitting for this virus diseases. Therefore, the compounds tested could be arranged in descending order as follows: Biofly, marshal

($\frac{1}{2}$ R), Naterlo and Marshal (1R).

Generally, Biofly fungal compound can be used successfully to reduce the whitefly stages by the rate of 100 ml / 100 L.W. and reducing the virus symptoms on tomato plants without environmental hazards. These results are in agreement with those obtained by Issa *et al.*, (1995).

2. Efficacy on *Aphis gossypii* nymphs

Data in Table (4) shows the effect of the tested materials on the population of *Aphis gossypii* nymphs. The results after the 1st spray clearly indicate that all tested materials except (Marshal $\frac{1}{2}$ R) reduced significantly the aphid population to different degrees. Materials can be arranged in a descending order as follows: marshal (1R), Naterlo, Biofly and Marshal ($\frac{1}{2}$ R). The corresponding percent reductions as a mean of total effect for these materials reached 91.93 %, 66.07 %, 58.73 % and 45.42 %,

respectively. It can be said that Marshal (1R) caused the highest % reduction in infestation reached 92.39 % as initial and 91.78% as a residual reduction till the end of the 1st spray. Naterlo and biofly gave a moderately percentage of population reduction during the inspection dates i.e., 66.07 % and 58.73 as total % respectively.

Data on the 2nd spray showed that all the tested treatments except Marshal ($\frac{1}{2}$ R) decreased significantly the pest population. Materials could be arranged according to their mean of total effect as Marshal (1 R) (82.95 %), Biofly (81.84 %), Naterlo (77.35 %) and Marshal ($\frac{1}{2}$ R) (46.15 %).

These finding agree with Metwally, Samia *et al.* (1999) who found that Naterlo can achieve a significant reduction of *A. gossypii* population and can be safely used on vegetable crops. Shalaby *et al.*, (1991) reported that, Marshal 25 % W.P. at 300 g / Fed. and 900 g / Fed. controlled excellently aphid in early season.

Table (4): Percent reduction in infestation with cotton aphid, *Aphis gossypii* on tomato plants treated with Biofly, Naterlo and Marshal at El-Zarkia, Sharkia governorate during early summer plantation (2002).

Treatments	Rate /100 L. water	Percent reduction in infestation with cotton aphid, <i>Aphis gossypii</i> at the indicated days after 1 st and 2 nd spray												General means of the total effects
		First spray						Second spray						
		Days						days						
		*(I)	3	5	7	**	General mean	*(I)	3	5	7	**	General mean	
Biofly	100 ml	41.52b	51.02b	71.43ab	70.96ab	64.47b	58.73b	78.57a	92.10a	81.89a	74.8ab	82.93a	81.84a	70.29
Naterlo	625 ml	83.14a	61.62b	68.47b	51.05bc	60.38b	66.07b	87.76a	95.22a	70.50a	55.92b	73.88a	77.35a	71.71
Marshal ½ R	50 ml	24.41c	66.80b	55.29b	35.16c	52.42b	45.42c	14.00b	57.52a	63.37a	49.71b	56.87b	46.15b	45.79
Marshal 1R	100 ml	92.39a	96.09a	90.48a	88.77a	91.78a	91.93a	62.00a	86.11a	83.70a	100.0a	89.94a	82.95a	87.44
Cont. No./ leaf		2.87	2.4	2.0	4.6			4.7	5.47	2.0	2.93			
L.S.D. 0.05 %		16.78	28.68	21.15	27.06	18.99	10.55	30.28	46.03	61.91	40.91	18.99	19.91	

Figures denoted by the same letter are statistically insignificant (at 5%) level.

*Mean of initial activity.

** Mean of residual activity (the effect from 3rd till 7th day after spray).

R = recommended rate.

½ R = Half recommended rate

Table (5): Percent reduction in infestation with moving stage of two spotted spider mite *Tetranychus urtica* on tomato plants treated with Biofly, Naterlo and Marshal at El-Zarkia, Sharkia governorate during early summer plantation (2002).

Treatments	Rate /100 L. water	Percent reduction in infestation with moving stages of two spotted spider mite, <i>Tetranychus urtica</i> at the indicated days after 1 st and 2 nd spray													General mean of the total effects
		First spray						Second spray							
		Days						Days							
		*(1)	3	5	7	**	General mean	*(1)	3	5	7	**	General mean		
Biofly	100 ml	30.20b	49.49a	56.88a	56.32a	54.23a	48.22b	53.10a	70.83a	69.31a	72.33a	70.82a	66.39a	57.31	
Naterlo	625 ml	87.47a	78.73a	45.95a	53.78a	59.49a	66.48a	66.16a	58.3a	60.44a	55.68ab	58.14ab	60.15a	63.31	
Marshal ½ R	50 ml	24.07b	34.71b	25.36b	37.54a	32.54b	30.42c	25.35b	48.2a	53.74a	35.02b	45.65b	40.58b	35.50	
Marshal 1R	100 ml	48.33b	77.42a	65.61a	45.61a	62.88a	59.24a	53.16a	59.95a	68.42a	71.17a	66.51a	63.18a	61.21	
Cont. No./ leaf		2.93	7.0	5.44	4.87			5.47	6.73	4.87	3.93				
L.S.D. 0.05 %		33.62	42.16	35.93	42.04	29.44	16.5	39.28	40.18	53.53	36.10	20.25	18.68		

Figures denoted by the same letter are statistically insignificant (at 5%) level.

*Mean of initial activity.

** Mean of residual activity (the effect from 3rd till 7th day after spray).

R = recommended rate.

½ R = Half recommended rate

3. Efficacy on the two spotted spider mite , *T. urtica*

Data in Table (5) showed that, Naterlo caused moderately initial and residual effects on *T. urtica* . They achieved 53.78 % reduction in infestation after 7 day from spray, while Biofly proved the least effective compound with low initial reduction and high effect on residual spider mite population. It was found that Biofly needs more times to achieve its efficacy. It caused 56.32 % reduction after 7 day from 1st spray. On the other hand, Marshal (1R) showed the moderate effectiveness on the *T. urtica* indicating 45.61 % reduction after 7 day from spray. Ibrahim – Abla (2001) found that, Naterlo and Biofly 3×10^7 I.U. gave 48.81 and 46.37 % reduction in infestation after 7 day on *T. urtica* in cotton field. Omar *et al.* (2000) reported that, the initial and residual effect of Biofly against the moving stages of *T. urtica* were 70.6 % and 80.6 % on tomato plants.

REFERENCES

- Abd-Allah, A.A.A. (1999). Effect of certain chemical and bio-control agents on whitefly, *Bemisia tabaci* (Genn.) infesting cucumber. Ph.D. Thesis, Fac. Agric., Zagazig Univ.
- Duncan D.B.(1955).Multiple range and multiple F-test Biometrics 11:1-42.
- El-Ghany, A.; El-Sayed, M. and Abo-El-Ghar, G.E.S. (1992). The influence of normal and low-rate application of insecticides on population of the cotton whitefly and melon aphid and associated parasites and predators on cucumber. Anzeiger- Fuer- Schaedl- Ingskunde, - Pflanzen schutz, - Umweltschutz (Germany, F.R.). 65 (3): 54 – 57.
- El-Maghraby, H.M.; M.H.M. El-Khawalka and M.A.El-Bessomy(1998).Effect of Knapsak sprayer and motor sprayer on efficiency of certain insecticides to control Thrips tabaci on onion plants.

- J. Agric. Sci., Mansoura Univ., 23(1):461-465.
- Emara, S.A.; A.M. Taha; M.Z. Dawood and K.K. El-RAfie (1999). Effect of oils, insecticides and the entomopathogenic fungus, *Beauveria bassiana* on the cotton whitefly, *Bemisia tabaci* Genn. and its natural enemies on cotton plants in Menofia Governorate. Egypt. J. Appl. Sci.; 14(8): 282 – 295.
- Henderson, C.F. and E.W. Tilton (1955). Tests with acaricidal against the brown wheat mite. J. Econ. Entomol. 48:157-161.
- Ibrahim, Abla, A. (2001). Effect of some recommended materials on the population of the two spotted spider mite, *Tetranychus urtica* Koch. in laboratory and cotton fields in Egypt. Egypt. J. Appl. Sci.; 16 (5): 291 – 300.
- Issa, Y.H.; H.I.U. Omar; M.H.M. El-Khawalka H.M. El-Maghraby and M.A.E. El-Bessomy (1995). Reduction in the population of different stages of whitefly, *Bemisia tabaci* (Genn.) on Tomato plants using two formulations of fungal compound (Naturalis). Egypt. J. Appl. Sci.; 10 (8): 599 – 603.
- Metwally, Samia, A.G.M.; S.M. Ibrahim and A.M. Gabre (1999). Studies on the effect of certain substances on the population density of whitefly *Bemisia tabaci* (Genn.), and cotton aphid *Aphis gossypii* Glover attacking squash crop. Agric. Sci. Mansoura Univ., 24 (5): 2629 – 2634.
- Omar, H.I.H.; M.A.E. El-Bessomy; H.M. El-Maghraby and M.H.M. El-Khawalka (2000). Effect of abamectin. compared with different compounds on the two spotted spider mite and two insect leaf miners. J. Agric. Sci. Mansoura Univ., 25 (12): 8089 – 8096.
- Rusmussen, - J.P. (1994). Admiral 10 EC: A new selective insecticide. SP-Report (Denmark). 2 (7): 325 – 336.
- Yassin, A.M. and M. Nour (1965). Tomato leaf curl diseases in the Sudan and

- their relation to tobacco leaf curl. Ann. Appl. Biol., 56 (2): 207-217.
- Shalaby, A.A.; Gomaa A. El-Adarosy, R.M. Sherif; M.A. El-Deeb and A.A. El-Fishawy (1991), Evaluation of pesticides on cotton insect pests. Zagazig J. Agric. Res., 18 (8): 2283 – 2300.

تأثير بعض المبيدات الحشرية على بعض الآفات الثاقبة الماصة وأعدادها
الحيوية على نباتات الطماطم

عاطف عبد الفتاح أحمد عبد الله

معهد بحوث وقاية النباتات - مركز البحوث الزراعية
الدقى- الجيزة - مصر

تهدف هذه الدراسة الى توضيح تأثير ثلاث مركبات من مجموعات مختلفة وهي الكاربوسلفان ٢٠٪ مركز معلق كمبيد كيمائى بعدين هما الموصى به ونصفه ، البيوفلاي كمبيد حيوى وناثيرلو ٩٧٪ كزيت طبيعى مركز قابل للاستحلاب ضد بعض الآفات الثاقبة الماصة وهى الذبابة البيضاء ومن القطن والعنكبوت الأحمر ذو البقعتين التى تصيب نباتات الطماطم وبعض أعدادها الحيوية الأكثر انتشار وكذا المظاهر الفيروسية .

أظهرت النتائج المتحصل عليها أن المبيدات المختبرة كانت أكثر فاعلية وتأثيرا بعد الرش الثانية عن الرش الأولى حيث زادت النسبة المئوية للانخفاض فى تعداد الحشرات بدرجات معنوية بعد الرش الثانية. وقد كان الكاربوسلفان بالمعدل الموصى به أكثر المركبات المختبرة تأثيرا على الآفات المختبرة وأيضا على الأعداء الطبيعية المتواجدة. أما البيوفلاي وناثيرلو كمواد طبيعية فقد أظهرت فاعلية معقولة ضد الآفات المقصودة بالمكافحة إلا أنها تحافظ على الكائنات الحية النافعة علاوة على أنها تقلل من المخاطر الناجمة عن استخدام مبيدات الآفات التقليدية على المحاصيل الغذائية .