



EGYPTIAN ACADEMIC JOURNAL OF
BIOLOGICAL SCIENCES
TOXICOLOGY & PEST CONTROL

F



ISSN
2090-0791

WWW.EAJBS.EG.NET

Vol. 15 No. 2 (2023)

www.eajbs.eg.net



Efficacy of Some Insecticides Against Whitefly, *Bemisia tabaci* (Genn.), White Butterfly, *Pieris rapae* (Linn.) and Their Associated Natural Enemies on Brassica Fields

Moshiera A.S. Ahmed¹, Noha H. Lokma¹ and Mohammed A. Hendawy²

¹Plant Protection Research Institute. Agricultural Research Center.Egypt.

²Plant Protection Department Fac. Agric. Zagazig Univ.

*E-mail:hendawymohamed065@gmail.com

ARTICLE INFO

Article History
Received:27/8/2023
Accepted:8/10/20223
Available:12/10/2023

Keywords:

Pieris rapae,
Bemisia tabaci,
Chemical control, s
effects and natural
enemies.

ABSTRACT

The aim of this study was to investigate the efficiency of four pesticides thiamethoxam, emamectin benzoate, lambda-cyhalothrin and methomyl (Lannate) against brassica plant pests *Bemisia tabaci*, *Pieris rapae* and their side effects on the associated natural enemies infesting brassica plants under field condition during the two growing seasons, 2021 and 2022 in Sharkia governorate in Egypt.

The obtained results showed that the thiamethoxam compound recorded the highest reduction percentage against *Bemisia tabaci* after 1, 7 and 10 days of spray. Also, emamectin benzoate and lambda-cyhalothrin compounds recorded the highest reduction percentage against *Pieris rapae* pests after 1, 7 and 10 days from treatment. The side effect was a significantly effectual reduction in population predators, where's methomyl gave efficacy against *Chrysoperla carnea*, also emamectin benzoate gave efficacy on *Coccinellaseptempunctata*, while other compounds showed a low effect in population predators.

INTRODUCTION

Cabbage (*Brassica oleracea* var. *capitata* L.) is a very important vegetable field that contains as vitamins and many task minerals as human food in all countries where contents as vitamins and many tasks mineral so infested by different pests, whereas brassica (cabbage), whitefly, *Bemisia tabaci* (Genn.) and whitefly, *Pieris rapae* (Linn.) one of the important insect pests of brassica and crop which causes remarkable quantitative and qualitative crop losses, these pests caused very losses in crop yields fresh which needed to control, the control of these pests whitefly, *B. tabaci* and *p. rapae* beside side effects pesticides on bio enemy green lacewing, *Chrysoperla carnea* (Stephens) and *Chrysoperla septempunctata* by convention pyrethroid pesticides in brassica and cauliflower fields.

Cabbage (*Brassica oleracea* var. *capitata* L.) is an herbaceous green leafy vegetable belonging to the Brassica genus, of the Brassicaceae family with several other crop species including broccoli, cauliflower, kale and kohlrabi (Katz and Weaver.,2003). Cabbage plants have been subjected to infestation by severe insect pests, especially the butterflies, *Pieris brassicae*, L. and *P. rapae* L (Razmi *et al.*, 2011; El-Sheikh, 2020).

However, the control of plant pests should be based on observations of the pest population and pest species (Ellis and Singh, 1993) in north Egypt, a weekly survey of pests present in cabbage crops was assayed by Embaby and Lotfy (2015).

The main objective of this study was to study the efficacy thiamoxam, lambadacyhalothrin, emamectin benzoate and methomyl compounds against whitefly, *B. tabaci* and white butterfly, *P. rapae* and their associated natural enemies on brassica fields.

MATERIALS AND METHODS

To study the occurrence of the most important economic pests attacking cabbage plants, field experiments were executed. An area of about one feddan.

Tested Compounds:

Lambada-cyhalothrin (Karate 5% EC) at a rate of 75ml/100/liter water obtained from Kafr El-Zayt Company for pesticides.

Thiamoxam (Actara 25% WG) at a rate of 80g/feddan, obtained from Syngenta Agro company Yanbu StreetDokki Giza-Egypt.

Methomyl (Lannate 90% SP) at a rate of 300g/feddan, obtained from Du Pont USA Starchem Industrial chemicals.

Emamectin benzoate (proclaim 5%SG) at arate of 60g/feddan, obtained from AGRES Syngenta.

To evaluate the reduction percentage of *P. rapae* larvae, 4 cabbage plants were tagged and visually examined in the field, 4 replicates for treatment) in addition to the control (without treatment). Mean numbers of *P.rapae* larvae were counted before spray by the selected compounds and consequently after 1-, 7- and 10-days post application. The reduction percentage of the targeted insect pest larvae was calculated according to Henderson and Tilton's (1955) equation. Data were statistically analyzed according to Little and Hills (1975), using F-test and means were compared according to Fisher (1950) and Duncan's multiple range tests as described by Steel and Torrie (1982). Controlling these pests substantially with insecticides treatments; expansiveuse of insecticides has led to controlling these pests substantially with led to several problems, including the reduction of natural enemies caused by insecticides causing rejuvenescence of new pests and the eruption of secondary pests (Ferandeset *al.*, 2010) *C. carnea* is a polyphagous sucker that preys on a wide range of pest species similar as; aphid, scale insects, leafhoppers, whiteflies, psyllids, thrips, psocids Lepidoptera, hence they are truly important biocontrol agents. These natural enemies fail to survive as a result of the extensive use of pesticides and sudden environmental changes (Nayar *et al.*, 1976) *C.septempuntata*, isanaphidophagous enemy species and animportant natural control agent (Hoded&HonA·, 1996, Alexidze). Extensive use of insecticides will lead to the death of many of the vital enemies of the pest, as well as the emergence of many secondary pests that harm the crop, (Cloud, 2012).

Field Experiments:

Experiments were done in Abn El-Aase, Kafr Sakr region, Sharkia governorate, Egypt during brassica planting seasons (2021 and 2022) in fields planted with brassica plants in October to evaluate the efficiency of teted insecticides namely, emmamactn benzoate (Proclaim), thiamethoxam (Actara), lambadacyalothrin (Karate zeon) and methomyl (Lannet) against *B. tabaci*, *P. rapae* and their side effects on the associated natural enemies during two consecutive seasons 2021 and 2022 in Sharkia Governorate Egypt on brassica (cabbage) fields. Moreover, the study pests were whitefly, *Bemiciatabaci* (Genn.) and white butterfly, *Pieris rapae* (Linn.) and associated predators the green lacewing, *Chrysoperlacarnea*((Stephens) and *Coccinellae spp.*

The experiment area about 1 feddan divided into 4 treatments and untreated (control), each treatment replicated three times. The plot had an area of 1/100 feddan. brassica plants treated with the tested compounds at the recommended rates with a solodosal sprayer motor (20 liters of water).

Randomly 25 brassica plants of each replicate were inspected in the field, the number of *P. rapae* and two predators (*C. carnea* & *Coccinellae spp.*); all instar larvae and two predators, were counted just before spraying and after one day (initial kill), 7 and 10 days (residual effect) with the tested insecticides. Additionally, the numbers of *B. tabaci* adult insects were counted visually in the early morning 25 leaves from three levels of the plant were picked up and put in paper bags then the sample was transferred to the laboratory and the number of *B. tabaci* nymphs was counted using a binocular stereomicroscope. The reduction percentages of pests were calculated according to Henderson and Tilton's (1955) equation:

$$\text{Reduction percentage} = 1 - (A/B * C/D) * 100$$

Where:

A= No. of alive larvae in the treatment after application.

B= No. of alive larvae in the treatment before application.

C= No. of alive larvae in the control before application.

D= No. of alive larvae in the control after application.

Statistical Analysis:

All obtained results statistically determined the significant difference between means according to Little and Hills' (1975) methods using software Costat program. Data were analyzed using commercial statistical software. One-way analysis of variance (ANOVA) was used to test for significant differences between mean values.

RESULTS AND DISCUSSION

A- Impact of Tested Compounds on *Piers rapae* Pests In Brassica Field During 2021-2022 Seasons.

Data in Table (1), showed that the highest initial effect of pesticides under studies on *Pieris rapae* pests were (87.69 and 85.13%) and (84.53 and 81.69%) recorded with emamectin benzoate and lambda –cyhalothrin compounds, respectively during seasons 2021 and 2022, but the lowest initial effect were 60.00 and 57.55% for thiamoxam. Also, the highest residual effects were (94.97 and 94.32%) and (89.13 and 90.72%) recorded with emamectin benzoate and lambda –cyhalothrin compounds, respectively on *Pieris rapa* during both seasons, compared to the lowest effects were 52.00 and 47.34% recorded with thiamoxam on *Pieris rapae* during seasons 2021-2022. The highest annual mean effects were (92.54 and 91.22%) and (87.53 and 87.71%) with emamectin benzoate and lambda –cyhalothrin, but the lowest annual mean effects were 54.67 and 50.74% recorded with thiamoxam treatment. In an agreement study about the other tested compounds in his manuscript, e. g. Evure (tau-fluvalinat) and Karate zeon (Lambda-cyhalothrin Sc 9.4%), Vukovic *et al.*, (2014) tested the efficacy of Tau-fluvalinate insecticide and Lambda –cyhaothrin based insecticides in the management of *P. rapae* and *P. xylostella* caterpillars. The results are supported by Sing, Rai and Singh (2010) and Youha and Hongemi (2009), who reported that emamectin benzoate compounds were effective in reducing the larval population of cabbage butterfly, *Pieris rapae* pests controlling 80-90%. Also, the results in agreement with the authors Gautam *et al.*, (2022), showed that emamectin benzoate and spinosad were found to give efficient control over cabbage butterfly, *Pieris brassicae*.

Table 1: Reduction parentage of *Pierisrabae* for some pesticides in brassica fields during seasons 2021-2022.

Treatments	2021					2022					
	Initial kill	Residual effect		Residual mean	Annual mean	Treatments	Initial kill	Residual effect		Residual mean	Annual mean
		7d.	10d.					7d.	10d.		
Methomyl	62.75	59.86	52.75	56.31 ^d	58.45 ^d	Methomyl	80.21	79.84	80.05	79.95 ^d	80.03 ^c
Emamectin	87.69	94.67	95.27	94.97 ^a	92.54 ^a	Emamectin	85.13	94.44	94.08	94.32 ^a	91.22 ^b
Thiamoxam	60.00	54.00	50.00	52.00 ^d	54.67 ^d	Thiamoxam	57.55	50.14	44.54	47.34 ^e	50.74 ^d
Lambada	84.53	88.86	89.39	89.13 ^b	87.53 ^b	Lambada	81.69	89.38	92.06	90.72 ^c	87.71 ^b
F. Test				**	**	F. Test				**	**
LSD 0.05				1.58	2.25	LSD 0.05				1.67	3.67

Values followed by the same letter (s) in the column are not significantly different according to Little and Hills (1975). % Reduction = $1 - (A/B * C/D) * 100$

Where:

A= No. of alive larvae in the treatment after application.

B= No. of alive larvae in the treatment before application.

C= No. of alive larvae in the control before application.

D= No. of alive larvae in the control after applications during 2021-2022 seasons.

B- Impact of Tested Compounds on *Bimiciatabaci* Pests in Brassica Field During 2021-2022 Seasons:

Results in Table (2), indicated the initial effect of the tested insecticides thiamethoxam expressed as the effectual reduction percentage were 91.78 and 90.17% after 24hr. from treatment during seasons 2021 and 2022, while emamectin benzoate and methomyl compounds gave moderate efficacy in the initial effect where the reduced percentage in population *B. tabaci* were (68.42 and 69.57%) and (65.81 and 65.70%), respectively, in both seasons, while the reduce initial effect were for methomyl during seasons on *B. tabaci* pests. Also, the highest residual effects were 95.38 and 91.79% for thiamoxam, compared with emamectin benzoate showed moderate efficient residual effects were 81.49 and 79.02% and methomyl 68.83 and 69.58% against pests. The highest annual mean effects were 94.18 and 91.25% in both seasons, but the moderate efficient annual mean effects were (77.13 and 75.87%) and (67.82 and 68.28%) with emamectin benzoate and methomyl during seasons 2021-2022. In agreement, Al-Kherb (2011) showed the highest efficacy against whiteflies in cucumber and tomato with thiamethoxam which partially agreed with the above results. The results are in accordance with Naggar and Zidan (2013), who showed that imidacloprid and thiamethoxam were the high effective against the sucking insect pest such as whitefly, jassids and aphids. Results in agreement with Das and Islam (2014) found that thiamoxam + emamectin benzoate showed moderate efficacy against whitefly *B. tabaci*. As well as the obtained results from (Wafa Al-Kherb, 2011) showed the effect of neonicotinoid insecticides, acetamiprid, imidacloprid and thiamoxam on immature stages and adults of *B. tabaci* was high on cucumber under field conditions, the tested neonectioniod could consider promising candidates, in controlling whitefly with a lower effect on their predators.

Mohanasundaram and Sharma (2011), found that thiamethoxam effectively reduced the sucking pests viz., leafhopper, whitefly and red spider mite populations during 1st, the 2nd, and 3rd sprays over two seasons on Okra, respectively.

Table 2: Reduction percentage of *Bemiciatabaci* for some pesticides in brassica fields during 2021-2022.

Treatments	2021					2022					
	Initial kill	Residual effect		Residual mean	Annual mean	Treatments	Initial kill	Residual effect		Residual mean	Annual mean
		7d.	10d.					7d.	10d.		
Methomyl	65.81	69.19	68.17	68.83 ^d	67.82 ^d	Methomyl	65.70	72.02	67.13	69.58 ^d	68.28 ^d
Emamectin	68.42	83.26	79.72	81.49 ^c	77.13 ^c	Emamectin	69.57	77.24	80.79	79.02 ^c	75.87 ^c
Thiamoxam	91.78	95.01	95.74	95.38 ^a	94.18 ^a	thiamoxam	90.17	92.08	91.49	91.79 ^a	91.25 ^a
Lambada	83.64	87.34	89.43	88.39 ^b	86.80 ^b	Lambada	74.09	87.17	82.67	84.92 ^b	81.31 ^b
F. Test				**	**	F. Test				**	**
LSD 0.05				1.64	1.43	LSD 0.05				1.89	1.43

Values followed by the same letter (s) in the column are not significantly different according to Little and Hills (1975). % Reduction = $1 - (A/B * C/D) * 100$

Where:

A= No. of alive larvae in the treatment after application.

B= No. of alive larvae in the treatment before application.

C= No. of alive larvae in the control before application.

D= No. of alive larvae in the control after application.

C- Side Effects of Pesticides for Natural Enemies on Brassica:

1- *Chrysoperlacarnea*:

Results in Table (3): showed the high efficacy reduction percentage of the initial effect were 91.86 and 91.27% after 24hr. for methomyl compound during seasons 2020-2021, but the lowest initial effect were 50.45 and 53.96% for emamectin benzoate during seasons on *C. canea* pests, also the highest residual effects were 92.37 and 92.37% with methomyl compound in both seasons, compared the lowest residual effect were 58.79 and 57.72% with emamectin benzoate during seasons 2021-2022. The highest annual mean effects were 92.20 and 92.00% for methomyl, also the lowest annual mean effects were 56.01 and 56.47% for emamectin benzoate in both seasons 2021-2022. In the same trend, Methomyl proved toxic to the larvae of *C. carnea* was in favor with the findings of Guvent *et al.* They found that Lannat (methomyl) showed high toxicity resulting in mortality rate of 100% (2003). Salama, *et al.* (1990) described that Lannat (methomyl) was proved toxic to *C. carnea* larvae in soya bean field conditions. It means that methomyl remained toxic even in field conditions. Also, Plapp Bull (1978) and Varghese and Beevi (2004) indicated that most organophosphate insecticides and methomyl were highly toxic to *C. canea* also, Badawy and El- Arnaouty (1999) had the same trend and reported that organophosphorous insecticides were more toxic and carbamates. That methomyl showed high toxicity resulting in mortality rate of 100%. Regarding to the reduction percentage of initial effect. The present findings regarding emamectin benzoate are in conformity with those of Sechser and Ayoub (2003) who reported that emamectin benzoate was at all stages of *C. carnea*. Castilhos *et al.*, (2010) also classified abamectin as slightly harmless recorded the lowest reduction percentage after 24hr.

Table 3: Side effects of pesticides on the associated natural enemies *Chrysoperlacarneaon* brassica during 2021-2022 seasons.

Treatments	2021					2022					
	Initial kill	Residual effect		Residual mean	Annual mean	Treatments	Initial kill	Residual effect		Residual mean	Annual mean
		7d.	10d.					7d.	10d.		
Methomyl	91.86	92.82	91.92	92.37 ^a	92.20 ^a	Methomyl	91.27	92.79	91.95	92.37 ^a	92.00 ^a
Emamectin	50.45	55.07	62.51	58.79 ^b	56.01 ^b	Emamectin	53.96	54.90	60.54	57.72 ^c	56.47 ^d
Thiamoxam	59.97	49.87	41.81	45.84 ^c	50.55 ^c	Thiamoxam	63.85	56.85	58.33	57.59 ^c	59.68 ^c
Lambda	91.95	93.20	92.74	92.97 ^a	92.63 ^a	Lambda	84.65	79.72	87.31	83.52 ^b	83.89 ^b
F. Test				**	**	F. Test				**	**
LSD 0.05				0.67	1.87	LSD 0.05				2.28	1.33

Values followed by the same letter (s) in the column are not significantly different according to Little and Hills (1975).% Reduction = 1- (A/B* C/D)*100

Where:

A= No. of alive larvae in the treatment after application.

B= No. of alive larvae in the treatment before application.

C= No. of alive larvae in the control before application.

D= No. of alive larvae in the control after application.

The obtained results in Table (4), indicated the highest initial effects reduction population *Cocconella spp.* 80.98 and 70.63% recorded with emamectin benzoate during seasons 2021-2022, but the lower initial effect were (60.29 and 41.03 %) and (64.13 and 74.25%) recoded with thiamoxam and methomyl compounds, respectively during both seasons, as well as the high efficacy residual effects were 84.34 and 74.42% with emamectin benzoate compound, also the lowest residual effects were (54.08 and 40.16%) and (49.00 and 56.21%) recorded with thiamoxam and methomyl, respectively. The highest annual mean effects were 83.22 and 73.15% with emamectin benzoate compound compared the lower annual mean effects were recorded (56.15 and 40.46%) and 54.03 and 62.22%) with thiamoxam and methomyl compounds, respectively during both seasons. In the same trend, Wafaa *et al.*, (2019) showed that emamectin benzoate recorded the highest reduction percentage on the predator insect *Coccinella spp.* Results agree with (Wafa Al-Kherb, 2011) showed the effect of neonicotinoid insecticides, acetamprid, imidacloprid and thiamoxam could be considered promising candidates, in controlling whitefly with a lower effect on their predator, *Coccinella spp.*

Table 4: Side effects of pesticides on the associated natural enemies *Coccinella septempunctata* on brassica during 2021-2022.

Treatments	2021					2022					
	Initial kill	Residual effect		Residual mean	Annual mean	Treatments	Initial kill	Residual effect		Residual mean	Annual mean
		7d.	10d.					7d.	10d.		
Methomyl	64.13	53.73	44.27	49.00 ^d	54.03 ^d	Methomyl	70.00	60.25	52.12	56.21 ^d	60.79 ^c
Emamectin	80.98	84.99	83.69	84.34 ^b	83.22 ^b	Emamectin	70.63	72.44	76.39	74.42 ^b	73.15 ^b
Thiamoxam	60.29	60.47	47.68	54.08 ^d	56.15 ^d	Thiamoxam	41.03	43.01	37.30	40.16 ^e	40.46 ^e
Lambda	79.00	71.99	61.94	66.96 ^c	70.98 ^c	Lambda	70.00	64.80	60.56	62.68 ^c	65.12 ^b
F. Test				**	**	F. Test				**	**
LSD 0.05				1.57	1.92	LSD 0.05				1.25	1.63

Values followed by the same letter (s) in the column are not significantly different according to Little and Hills (1975).% Reduction = 1- (A/B* C/D)*100

Where:

A= No. of alive larvae in the treatment after application.

B= No. of alive larvae in the treatment before application.

C= No. of alive larvae in the control before application.

D= No. of alive larvae in the control after application.

REFERENCES

- Al-Kherb, W. A. (2011). Field efficacy of some neonicotinoid insecticides on whitefly, *Bemisia tabaci* (Homoptera: Aleyrodidae) and its natural enemies in Cucumber and Tomato plants in Al-Qassim region. *KSA Journal of Entomology*, 8 (5): 429-439.
- Badawy, H. M. A. and S. A. Amaouty El (1999) Direct and indirect effects of some insecticides on *Chrysoperla lacanea* (Stephens) s.l. (Neuroptera: Chrysopidae) . *Journal Neuroptology*, 2:67-76.
- Castilhos, R. V., A.D. Grutzmacher, D. E. Nava; M.n.J. Zoti, P. R. B. Siqueira and D. Spagnol (2013). Selectivity of pesticides used in peach orchards on the larval stage of the predator *Chrysoperla laextema* (Hagen) Neuroptera: Chrysopidae). *Semina: Ciências Agrárias. Londrina*, 34(6 Sup1). 3585-3596.
- Cloyd, RA. 2012 Indirect Effects of Pesticides on Natural Botanical Pesticides. *Journal of Entomology*, 127-149.
- Das, G and T. Islam (2014). Relative efficacy of some newer insecticides on the mortality of Jassid and whitefly in Brinjal. *International Journal of Research and Biology. Science*, 4 (3): 89-90.
- Ellis, P.R. and Singh, R. (1993) 'A review of the host plants of the cabbage aphid *Brevicoryne brassicae* (Homoptera: Aphididae)' *Bulletin Oilb Srop (France)*, 16(5), pp. 192-201.
- El-Sheikh, W.E. A. (2020) 'The Seasonal Abundance of Immature Stages of the Cabbage Worm, *Pieris rapae* L. on Cabbage Crop in Beni Suef. Governorate' Egypt. *Journal of plant Protection and Pathology, Mansoura University*. 11(7), pp. 365-368.
- Embaby, M. E. and Lotfy, D 2015. Ecological Studies on Cabbage Pests. *International Journal Agricultural Technology*, 11(5):1145-1160.
- Fermin, A. A., Pilar, M. A., Paloma, B. A.; Monica, C. B., Pedro, V. B., Rui, C. B., Federico, G.C.; Manuel, G. C.; Flor, B. A.; Elisa, V. A. and Juan, A. L. B. (2012): Effect of Emamectin benzoate under semi-field and field condition on key predatory biological control agents used in vegetables greenhouse. *Biology Science and Technology*, 22(2):219-232.
- Fernandes FL, Bacci L, Fernandes MS., 2010, Impact and Selectivity of Insecticides to Predators and Parasitoids. *Entomology Brasilia*, 3(1):01-10.
- Gautam, B.; S. Tiwari and R. B. Thapa (2022). Efficacy of insecticides against *Pieris brassicae nepalensis* (Doubleday) on cabbage in Chitwan, Nepal. *International Journal of Recent Advances in Multidisciplinary Topics*, Volume 3, Issue 8, August 2022, <https://www.ijrmt.com/ISSN> (Online): 2582-7839.
- Güven, B.; M. A. Goven; H. Vogt; U. Heimback and E. Vincula (eds.) (2003). Side effects of pesticides used on cotton and vineyard areas of Aegean Region on green lacewing, *Chrysoperla lacrnea* (Stephens) (Neuroptera: Chrysopidae), in the laboratory Proc. IOBC-WPRS working group: Pesticides and beneficial organism. *Bulletin Oilb Srop*, 26 (5) 21-24.
- Henderson, C. F. and E. W. Tilton (1955). Tests with acaricides against the brown wheat mite. *Journal of Economic Entomology*, 48: 157-161.
- Hodek I, Honěk A., 1996, Ecology of Coccinellidae. Kluwer, Dordrecht, 464.
- Katz, S.H. and Weaver, W.W. (2003) 'Encyclopedia of Food and Culture' 2, pp. 279-285.
- Little, T. M. and F. J. Hills (1975). Statistical methods in agricultural research available from U. C. D. Book store, University, of California, Davis: 241 pp.

- Mohanasundaram, A. and R. K. Sharma (2011). Effect of newer pesticide schedules on the population of sucking pests and predators on Okra. *Pesticide Research Journal*, 23 (1): 55-63.
- Naggar, N. J. B. and N. E. H. A. Zidan (2013). Field evaluation of Imidacloprid and Thiamoxam against sucking insects and their side effects on soil fauna. *Journal of Plant Protection Research*, 53 (4): 375-387.
- Nayar KK, Ananthak TN, David BV. 1976, General and applied entomology Tata McGraw Hill publishing company limited, India, 569.
- Plapp, F. W. Jr. and D.L. Bull (1978). Toxicity and selectivity of some insecticides to *Chrysoperla carnea*, predator of the tobacco bud worm. *Environmental Entomology*, 7, 431-4236.
- Razmi, M., Karimpour, Y., Safaralizadeh, M.H., Safavi, S.A. (2011) 'Parasitoid Complex of Cabbage Large White Butterfly *Pieris brassicae*(L.) (Lepidoptera, Pieridae) in Urmia with New Records from Iran'. *Journal of Plant Protection Research*, 51(3). doi: 10.2478/v10045-011-0041-9.
- Sechser, B. and S. Ayoub (2003). Toxicity of thiodicarb, methomyl and emamectin benzoate against predators of sucking insect pests of cotton. *Zeitschrift für Pflanzenkrankheiten and Pflanzenschutz*, 110: 184-194.
- Singh, S. S. Rai, M. K. & Singh, V. B. (2010) Field efficacy of certain bio rational insecticides and *Bacillus thuringiensis*-based bio-insecticides against cabbage butterfly, *Pieris brassicae* Linn. Vegetable. *Journal of Entomology*, 33(2)111:122.
- Steel, R.G.D. and J.H. Torrie. 1982. Principles and Procedures of Statistics. A Biometrical Approach, McGraw-Hill Book Co.
- Varghese, B. and S. N. Beevi (2004). Safety of insecticides to the green lacewing *Chrysoperla carnea* (Stephens). *Insect and Environment*, 10 (1): 45:47.
- Vukovic, S.; Indic, D.; Gvozdenac, S. and Cervenski, J. (2014). Efficacy of insecticides in the control of cabbage pests. *Research Journal of Agricultural Science*, 46 (2):421-425.
- Waffa, o. Mohmed; Mohana, A. H., El-Sharkawy, H. M. and Al-Shannaf, H. M.H. (2019). Field evaluation of some insecticides against *Spodoptera littoralis* and insect predator *Coccinella* spp. In cotton fields. *Journal of Production & Development*, 24(4):919-927.
- Youhua, L., & Hongmei, Z. (2009). Toxicity and effects of 12% chlorfenapyr emamectin benzoate SC against main vegetable pests. *Plant Protection*, 4, 41.

ARABIC SUMMARY

فعالية بعض المبيدات الحشرية على الذبابة البيضاء و ابي دقيق الكرنب والاعداء الحيويه المصاحبه في حقول الكرنب

مشيره احمد سيد احمد 1 - نهى حسن عصام لقمه 1 - محمد عبد العال هنداوى 2

1- معهد بحوث وقاية النباتات - الدقي - الجيزه

قسم وقاية النبات كلية الزراعة جامعة الزقازيق

تهدف هذه الدراسه الى دراسه فعاليه اربعة من مبيدات الافات وهى ثيوميسكسام وايمامكتن بنزاوات ولمباداسيهالوثرين وميثوميل على افات نباتات الكرنب الذبابة البيضاء و ابي دقيق الكرنب وكذلك دراسه الاثار الجانبيه على الاعداء الحيويه المصاحبه تحت ظروف الحقل خلال موسمى الزراعه 2021 و 2022 فى محافظة الشرقيه .

اظهرت النتائج ان مبيد ثيوميسكسام سجل اعلى نسبة خفض فى تعداد الذبابة البيضاء بعد 1 و 7 و 10 ايام من المعامله . كما اظهرت النتائج ان هناك تاثير معنوفى خفض اعداد المقترسات . سجل مبيد ايمامكتن بنزاوات ومبيد لمباداثيرالوثرين اعلى نسبة خفض فى تعداد ابي دقيق الكرنب والمقترسات معا . فى حين اعطى مبيد ميثوميل اعلى تاثير ضار على المقترس اسد المن . ايضا اعطى مبيد ايمامكتن بنزاوات اعلى تاثير ضار على المقترس ابو العيد 7 نقط وباقى المركبات اعطت تاثيرات اقل على المقترسات .