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Washing the insecticides due to natural events or mechanical reason after application and its efficiency against immature stages of *Bemisia tabaci* (Genn.) and on associated parasitoids

Homam, B. Homam; Mohamed H. A. Soliman and Mona A. Mohamed
Dep. Vegetable Pests Research, Plant Protection Research Institute,ARC
Dokki, Giza, 12618 Egypt

ABSTRACT

Efficient chemical is achieved when insecticides are active against insect pests and safe to natural enemies (parasitoids). In this study the toxicity of four toxicants, Pyriproxifen (10% EC), Imidacloprid (20% SG), Methoxyphenozide (24% SC) and CAPL-2 (96% EC) are used to explore the role of washing insecticides after 1, 12 and 24 hours of application against immature stages of *Bemisia tabaci* (Genn.) and associated parasitoids *(Encarsia lutea* Masi. and *Eretmocerus mundus* Mercet). The washing may be due to natural events (rainfall, mist or dewy) or mechanical reason (any irrigation system causes washing). Statistical analysis was showed that, the tested insecticides have significant differences on two cases of application (unwashed and washed insecticides) against eggs, nymphs of *B. tabaci* and associated parasitoids in all tested compounds after 1 and 12 hours of washing insecticides, while after 24hr. of insecticidal washing causes non significant difference between two cases except for Pyriproxifen (10% EC) gave significant difference after three times of washing against eggs. This may be due to that compound act as Insect Growth Regulator (IGR). Insecticides washing cause decrease in efficiency of insecticides against the target (pest), but causes passive effect against the parasitoids.

The differences value between previous cases of application, in case of eggs range between (11.68-55.57), (17.32-43.48) and (9.77-28.0) after 1, 12 and 24 hr., respectively. But, nymph ranged between (14.49&19.98), (8.41&16.5) and (0.93 & 2.52) after 1, 12 and 24 hr., respectively, while in parasitoid recorded (3.8 & 7.02), (2.68 & 2.97) and (0.1 & 2.3) after 1, 12, 24 hr, respectively.

To avoid the insecticidal washing must be taken in consideration:

1- Check the metrologistic report and schedule irrigation time of pivot or any irrigation system causes washing the insecticides from plants.
2- Do not apply the insecticides at expected rainfall, mist or dewy.

Key Words: insecticides, *bemisia tabaci*, parasitoids

INTRODUCTION

Bean plant, (*Phaseolus vulgaris* L.) is one of the important crops that fit for foreign and local markets. It is considered as a high yielding seeds legume, and one of the productive protein-rich fodder plants. In Egypt, it seeds provide a cheap source of protein (Kaiser *et al.*, 1971; Wahba *et al.*, 1986 and El-Sayed *et al.*, 1989). Various pests' attack this plant, among which is whitefly, *Bemisia tabaci* (Genn.). Infestation by *B. tabaci* modifies the vegetative and reproductive development of the injured plant (Toscano *et al.*, 2004). This insect can cause direct damage by sucking the plant sap and injecting toxins in the plant. The later cause physiological changes including leaf silvering in cucurbits (Costa *et al.*, 1993), irregular ripening of tomatoes (Schuste *et al.*, 1990) and foliar disorders in ornamentals (Tsai *et al.*, 1997).

In the present study, the evaluation efficiency of insecticides used did not aim

of this work but we did to release the role of washing insecticides after application. This washing may be due to natural events (rainfall, mist or dewy) or mechanical reason (irrigation system).

MATERIALS AND METHODS

Field experiments were carried out in Menofia Governorate, El-Shohadaa District, Gezerat El-Hagar Village. Bean, *Phaseolus vulgaris* L. Giza 6 variety, seeds were planted in one feddan (4200 m^2) area on the 20th August, 2008 .The area were divided into four parts. Each of the first three parts were divided into two parts (A and B).The A part of each first, second and third part represent the wash insecticides after 1,12 and 24 hr., respectively, insecticides application. While the B part of the first three parts represent the unwash of insecticides. The fourth part represent the control. In order to apply the Randomized Complete Blocks Design(RCRD), each part of bean plants were divided into 12 plots, each of 43 m^2 (4.3X10 m^2), replicated three times in each treatment and case of application, the knapsack sprayer with one nozzle used to apply and wash the insecticides. This, do at the length of washing the insecticides application after 1, 12, and 24 hr. The rate of water used for insecticides application are also used for washing the insecticides after application (1, 12, and 24 hr.).

The rates of tested insecticides per 100 L. of water were as follows:

1. Pyriproxyfen (10%EC), (Admiral) 75 cm/100 liter water.
2. Imidacloprid (20% SG), (Admire) 50 cm / 100 liter water.
3. Methoxyfenozide (24% SC), (Runner) 150 cm/ feddan.
4. CAPL- 2 (96% EC), petroleum oil, 1250 cm / 100 liter water.

Random samples of 30 leaflets were collected from the three replicates. Inspection of eggs and nymph of *B. tabaci* stages and its parasitoides, samples were made immediately before spraying and after 1, 3, 5 and 7 days after treatments.

The reduction% in each treatment was calculated according to Henderson and Tilton (1955) formula. All the aforementioned data were statistically analyzed by F test. In each sample of bean leaves the parasitism percent by the two aphelinid parasitoides, *Encarsia lutea* Masi and *Eretmocerus mundus* Mercet were estimated by counting the number of parasitized nymph of *B. tabaci.* These leaflets were cut into pieces that could be in Petri dishes lined with filter paper until emergence of adult parasitoids. The number of emerged adults was recorded on each of the days before and after insecticides application.

RESULTS

The obtained result presented as Henderson and Tilton as expressed (Table 1 and 2) (Fig 1 and 2). Fig 1 and 2 showed that, curves represent un washed and washed insecticides during three times after 1, 2 and 24 hr. of application on eggs and nymph of *B.tabaci* , respectively.

Data in table (1 and 2) proved that there is significant difference between two cases of application in both eggs and nymphs in all tested compounds after 1 and 12 hr. of washing insecticides, while after 24 hr. of washing insecticides causes non significant difference between two cases (un washed and washed) except for Pyriproxfen treatment gave significant difference after three times of washing on eggs. Reduction % of the tested insecticide (Pyriproxfen, Imidacloprid, Methoxyphenozide and CAPL-2) on egg recorded (77.89, 64.91, 52.24 and 75.05), (79.13, 68.04, 55.46 and 79.84) & (86.68, 71.52, 57.97 and 85.47) for insecticide unwashing after 1, 12 and 24 hr., respectively. Comparing with (22.32, 53.23, 31.54 and 34.05), (35.65, 50.72, 36.16 and 58.21) & (58.68, 48.07, 48.20 and 72.81) for washing after 1, 2 and 24 hours, respectively. Also, the same trend occurs in case of nymph where reduction percent of the previous insecticides recorded (70.82, 65.5, 66.69 and 55.69%) incase of unwashed insecticides comparing with (53.28, 49.01, 48.71 and 36.54%) for insecticide wash after 1 hr., respectively., (71.27, 65.62, 67.92 and 56.65%) in case in unwashed comparing with (62.86, 56.77, 51.4 and 43.87%) for washing after 12 hr., respectively. (68.62, 65.25, 65.3and 53.28%) in case of unwashed comparing with (66.1, 66.41, 63.5 and52.35%) for insecticide wash after 24hr., respectively.

The difference value ranged between in previous cases of application on eggs (11.68 - 55.57), (17.32- 43.48) and (9.77-28.0) after 1, 12 and 24 hr.

respectively. And nymph range between (16.49-19.98), (8.41-16.52) and (0.93-2.52) after 1, 12 and 24 hr. respectively. While in parasitoid ranged between (3.65 - 7.02), (2.68 – 3.65) and (0.1 - 2.3) after 1, 12 and 24 hr., respectively. Data in the table 3, show the parasitism percent of the parasitoid *Encarsia lutea* and *Eretmocerus mundus*, which the reduction percent of incase unwashed insecticides comparing the previous insecticides on parasitism recorded (18.45, 16.42, 13.66 and 17.06%) with (22.31, 20.07, 14.87%) unwashed (20.82, 19.07, 16.95 and 20.68 and 20.86%) for insecticidal washing after 1hr., respectively, (1812, 16.1, 13.3 and 17.55%) washed insecticides after 12 hr., respectively.(17.2, 14.43, 12.12 and 13.87%) unwashed, (17.3, 16.73, 12.62and 15.37%) washed insecticides after 24hr., respectively.

Table (1): comparative of Reduction % between two cases (un washed and washed insecticides) after three times of application oneggs of *B. tabaci* (Genn) on bean plants.

Treatments	Reduction % After 1 hr.									Diff. value
	Un wash					wash				
	1 day	3days	5days	7days	mean	1 day	3days	5days	7days	mean	
Pyriproxifen (10% EC)	48.14	٧٩,٧٧	٩١,٩٣	٩١,٧٣	77.89	٨,٩٣	١٦,٣٠	٤٣,٩	٢٠,١٥	22.32	55.57
Imidacloprid (20% SG)	30.37	50.14	88.34	90.82	64.91	16.44	31.67	57.52	70.52	53.23	11.68
Methoxyfenozide (24% SC)	٢٢,٥٩	٧٢,٣٩	٥٩,٢٣	٥٤,٧٥	52.24	١٧,86	٤٩,٣٦	٣٣,٢٠	٢٥,٧٥	31054	20.7
CAPL-2 (96% EC)	٨٤,١٠	٧٧,٠٠	47.10	٦٥,٠٠	75.05	٤٠.00	.00٣٨	.00٣٢	٢٦,٢٠	34.05	41
	After 12 hr.										
Pyriproxifen (10% EC)	٥١,٠٠	٨٣,٠٠	92.50	٩٠,٠٢	79.13	٢٨,٢٠	٣٥,٤٠	٥٠,٠	٢٩,٠٠	35.65	43.48
Imidacloprid (20% SG)	46.26	48.2	86.5	91.2	68.04	29	30.1	69.3	73.5	50.72	17.32
Methoxyfenozide (24% SC)	٣٨,٣٠	٧٠,٥٠	٦٢,٦٠	٥٠,٨٠	55.46	٢٠,١٤	٥٢,٠٢	٤٠,٨٠	٣١,٧٠	36.16	19.3
CAPL-2 (96% EC)	٨٨,٥٠	٨٢,٥٠	٨٠,٠١	٦٨,٣٥	79.84	٦٠,٥٢	٦١,٧١	٦٦,٧١	٤٣,٩٠	58.21	21.63
	After 24 hr.										
Pyriproxifen (10% EC)	٧٥,٠٠	٨٦,٧٧	٩٠,٩٦	٩٢,٧٠	86.68	٣٩,٣٠	٥٨,٢٥	٦٠,٢٠	٦٨,٠٠	58.68	28.0
Imidacloprid (20% SG)	47	55.2	91.5	92.4	71.52	36.3	48.00	82	86.2	48.07	23.45
Methoxyfenozide (24% SC)	٥٠,٢٠	٦٥,٣٠	٦٠,٠٠	٥٦,٤٠	57.97	٣٦,٨٠	٥٥,٤٠	٩,٧٠4	٥٠,٩٠	48.2	9.77
CAPL-2 (96% EC)	٨٩,٧٦	٨٣,٤٠	٨٥,٦٠	74.13	85.47	٧٥,٣١	٧٦,٤٣	٧٢,٥٠	٦٦,٩٠	72.78	12.69

LSD 0.05: days (1 ,3, 5 ,7) after 1hr. (16.54, 16.14, 17.01, 16.01). 12 hr.(13.12, 15.21, 10,51. 15.65). 24 hr. (17.33, 16.3, 18.22, 17.25).

Table (2): comparative of Reduction % between two cases (unwashed and washed insecticides) after three times of application on nymph of *B. tabaci* (Genn) on bean plants.

Treatments	Reduction % After 1 hr.									Diff. value
	Un wash					wash				
	1 day	3days	5days	7days	mean	1 day	3days	5days	7days	mean	
Pyriproxifen (10% EC)	59.34	٥٣,١٥	٨٠,٨٧	٩٠,٠١	70.82	٢٦,١٦	٣٨,٨٦	٧١,٧٥	٧٦,٣٤	53.28	17.54
Imidacloprid (20% SG)	٣٩,٧٦	٥٨,٠٠	٧٢,٥٠	٩١,٧٣	65.5	٢١,٣٧	٤٣,٥٦	٥٣,٨٨	٧٧,٢٥	49.01	16.49
Methoxyfenozide (24% SC)	٤١,٥٧	٧٧,٠٠	٨٠,٨٦	٦٧,٣١	66.69	١٢,٩٦	٧٠,٢٣	٧٠,٤٩	٤١,١٩	48.71	19.98
CAPL-2 (96% EC)	٥٠,٩٣	٦٨,٥٣	٥٦,١٧	٤٧,١٦	55.99	٦,٦٠	٥٥,٣٩	٤٨,٣٩	٣٥,٧٩	36.54	19.15
	After 12 hr.										
Pyriproxifen (10% EC)	٥٨,٠٠	٥٥,٠٠	٨١,١٠	٩١,٠٠	71.27	٤٧,٠٢	٤٦,٠١	٧٦,٠٠	٨٢,٢٠	62.80	8.41
Imidacloprid (20% SG)	٣٩,٠٠	٥٩,٥٠	٧١,٠٠	٩٣,٠٠	65.62	٢٩,٠٠	٤٨,٠٠	٦٨,١٠	٨٢,٠٠	56.80	8.85
Methoxyfenozide (24% SC)	٤٢,٠٠	٧٩,٠٠	٨١,٥٠	٦٩,٢٠	67.92	١٥,٢٠	٧٢,٠٠	٧٣,٢٠	٤٥,٢٠	51.4	16.52
CAPL-2 (96% EC)	٥١,٢٠	٦٩,٢٠	٥٨,٠٠	٤٨,٢٠	56.65	٣٠,٤١	٥٠,٥١	٥٣,٣٣	٤١,٢٦	43.87	12.78
	After 24 hr.										
Pyriproxifen (10% EC)	٥٦,٠٠	٥٢,٠٠	٧٧,٠٠	٨٩,٥٠	68.62	٨٩,٥٠	٥٠,٠٠	٧٦,٨٠	٨٨,٠٥	66.1	2.52
Imidacloprid (20% SG)	٤٠,١١	٥٧,٠١	٧٥,٦٠	٨٨,٣٠	65.25	٨٨,٣٠	٥٨,٥٠	٧٧,٩٠	٨٦,٧٠	66.41	1.16
Methoxyfenozide (24% SC)	٤٠,٠٢	٧٦,٠٠	٧٩,٠٠	٦٦,٢٠	65.36	٦٦,٢٠	٧٥,٠٠	٧٨,٠٠	٦٥,٠٠	63.5	1.86
CAPL-2 (96% EC)	٥٣,٠٠	٥٩,١٠	٥٦,٠٠	٤٥,٠٢	53.28	٤٥,٠٢	٥٧,٣١	٥٥,٨٠	٤٤,١١	52.45	0.93

LSD 0.05 : days (1 ,3, 5 ,7) after 1hr. (6.2, 2.73, 2.46, 4.13). 12 hr. (5.11, 1.5, 2.33, 3.22). 24 hr. (7.33, 4.11, 3.56, 4.71).

Table 3: comparative of Reduction % between two cases (un washed and washed insecticides) after three times of application on parasitoids of *B. tabaci* (Genn) on bean plants.

Treatments	Reduction % After 1 hr.									Diff. value
	Un wash					wash				
	1 day	3days	5days	7days	mean	1 day	3days	5days	7days	mean	
Pyriproxifen (10% EC)	٢١,٠	١٧,٦	١٧,٣	١٧,٩	18.45	٢٦,١٩	١٩,١	١٨,٦	٢٥,٣٦	22.31	3.86
Imidacloprid (20% SG)	٢٢,٠٨	١٦,٦٧	١٥,٨٤	١١,١١	10.42	٢٧,٤١	٢٠,٨١	١٧,٥٠	١٤,٥٨	20.07	3.65
Methoxyfenozide (24% SC)	١٣,٢	١٤,٥	١٢,٩	١٤,٠٤	13.66	٣٥,٢٧	٢٠,٠	١٤,١٩	١٣,٢٦	20.68	7.02
CAPL-2 (96% EC)	١٤,٨٨	١٣,٠٢	١٠,٧٨	٢٩,٥٩	17.06	٢٩,٣٦	١٩,١٢	١٨,٩٧	١٦,٠٢	20.86	3.8
	After 12 hr.										
Pyriproxifen (10% EC)	٢٠,٢	١٩,٠	١٦,٥	١٦,٨	18.12	٢٥,٠	٢٠,٧	١٧,٥	٢٠,١	20.82	2.7
Imidacloprid (20% SG)	٢٠,٣	١٨,١	١٣,٩	١٢,١	16.1	٢٣,١	٢١,٨	١٧,١	١٤,٣٠	19.07	2.97
Methoxyfenozide (24% SC)	١٢,٧٠	١٥,٣٠	١١,٥	١٣,٧	13.3	١٧,٤	٢١,٠	١٢,٣٣	١٧,١	16.95	3.65
CAPL-2 (96% EC)	١٣,٦	١٢,١	١٥,٦	١٨,٦	14.87	٢٤,٣	١٧,٥	١٦,٢	١٢,٢	17.55	2.68
	After 24 hr.										
Pyriproxifen (10% EC)	١٨,٢	١٧,٦	١٥,٠	١٨,٠	17.2	٢٠,٠	١٨,٤	١٣,٦	١٧,٢	17.3	0.1
Imidacloprid (20% SG)	١٩,٠١	١٦,٥١	١٢,١	١٠,١٣	14.43	٢١,٣٣	١٩,٨	١٣,٠	١٢,٨٠	16.73	2.3
Methoxyfenozide (24% SC)	١٣,١	١٣,٧	١٠,١	١١,٦	12.12	١٣,٨	١٤,٩	١٢,١	٩,٧	12.62	0.5
CAPL-2 (96% EC)	١٤,٠	١١,٣	١٣,٥	١٦,٧	13.87	١٦,٣	١٦,١	١٥,٠١	١٤,١	15.37	1.5

LSD 0.05: days (1 ,3, 5 ,7) after 1hr. (4.22, 1.38, 1.20, 0.71), 12 hr.(2.56, 1.15, 1.00, 1.02) and 24 hr. (5.32, 6.71,3.55, 4..32).

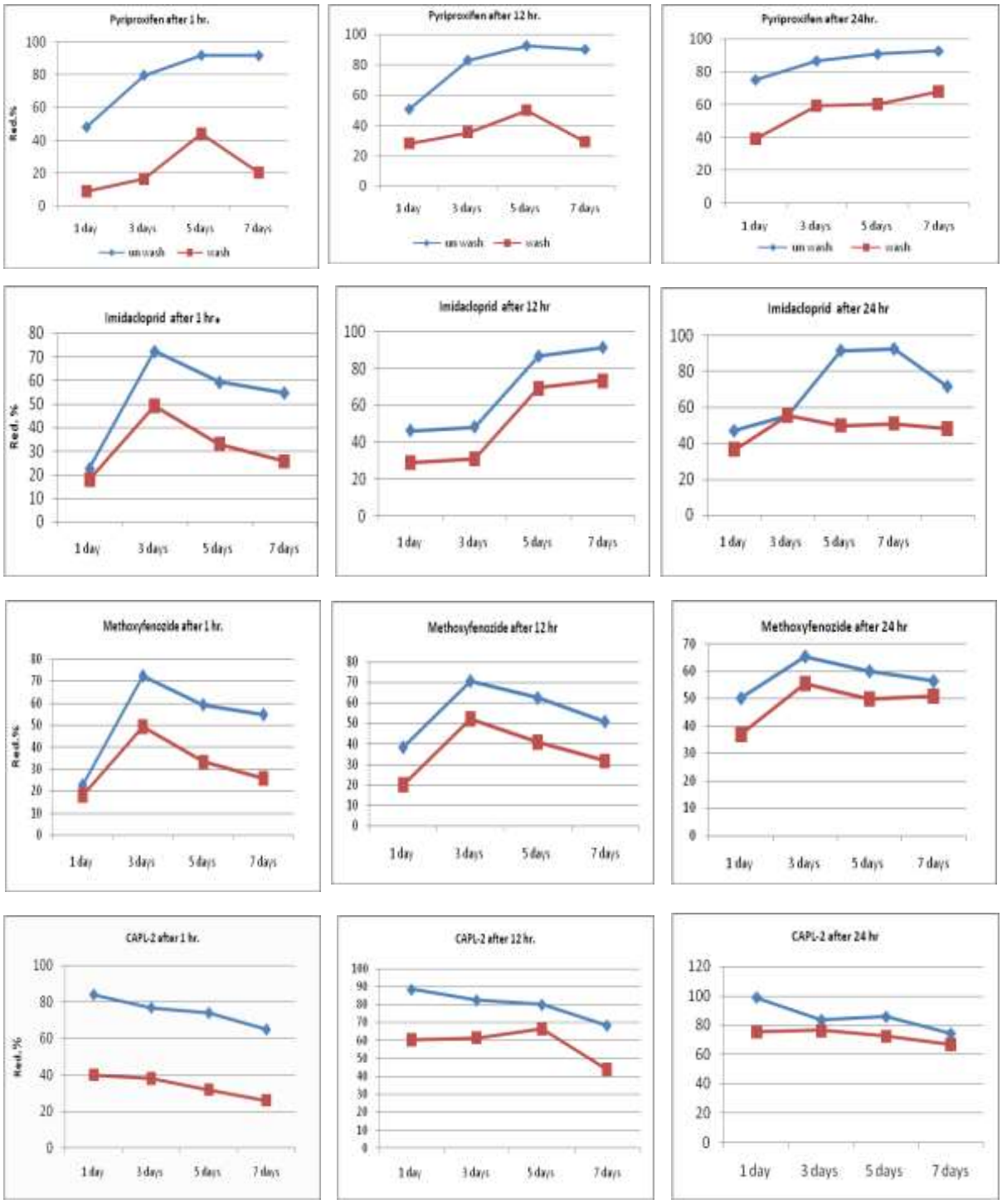

Fig. (1): The difference between two cases (un washed and washed insecticides) after three times of application on eggs of *B. tabaci* on bean plants.

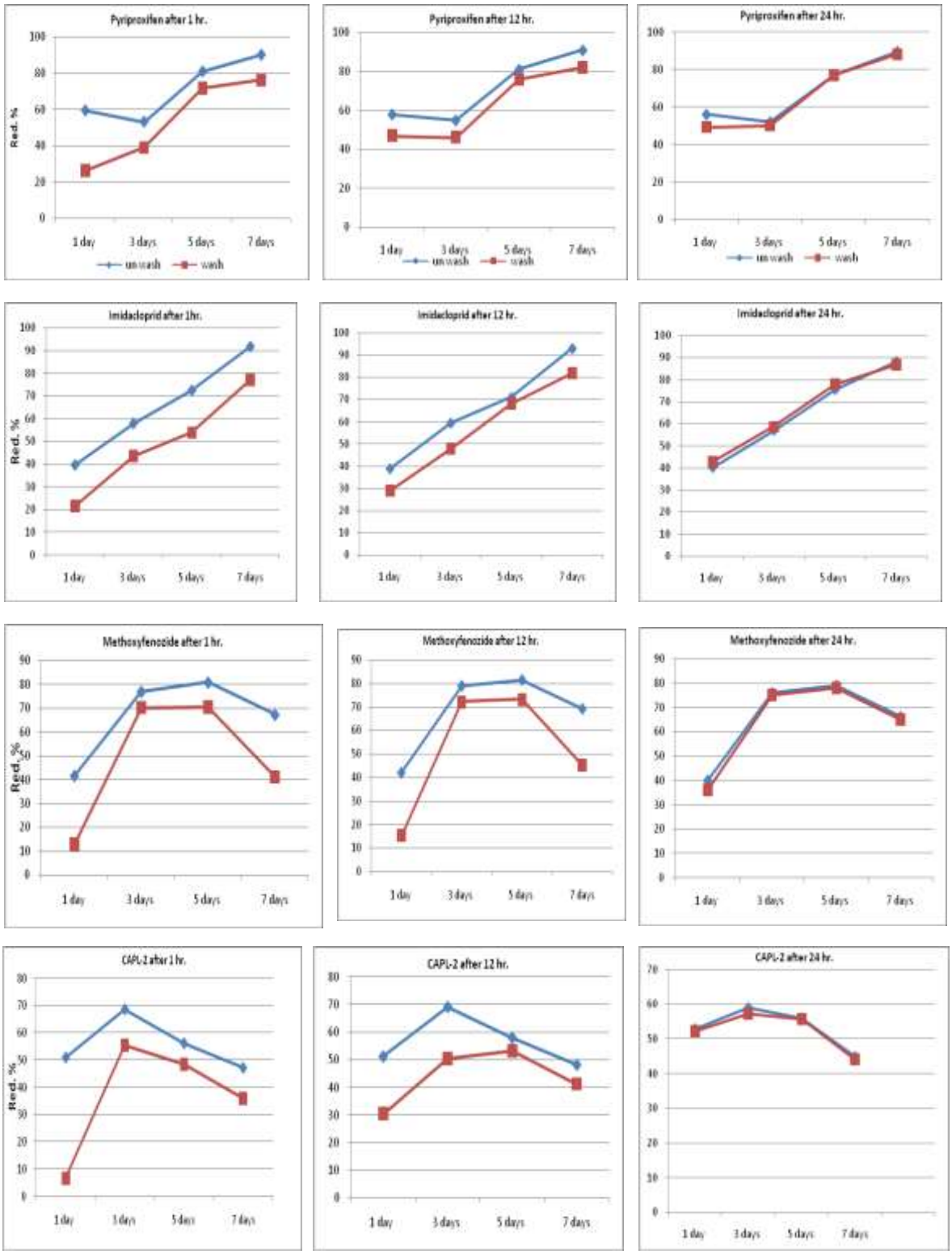

Fig. (2): The difference between two cases (unwash and wash insecticides) after three times of application on nymph of *B. tabaci* on bean plants.

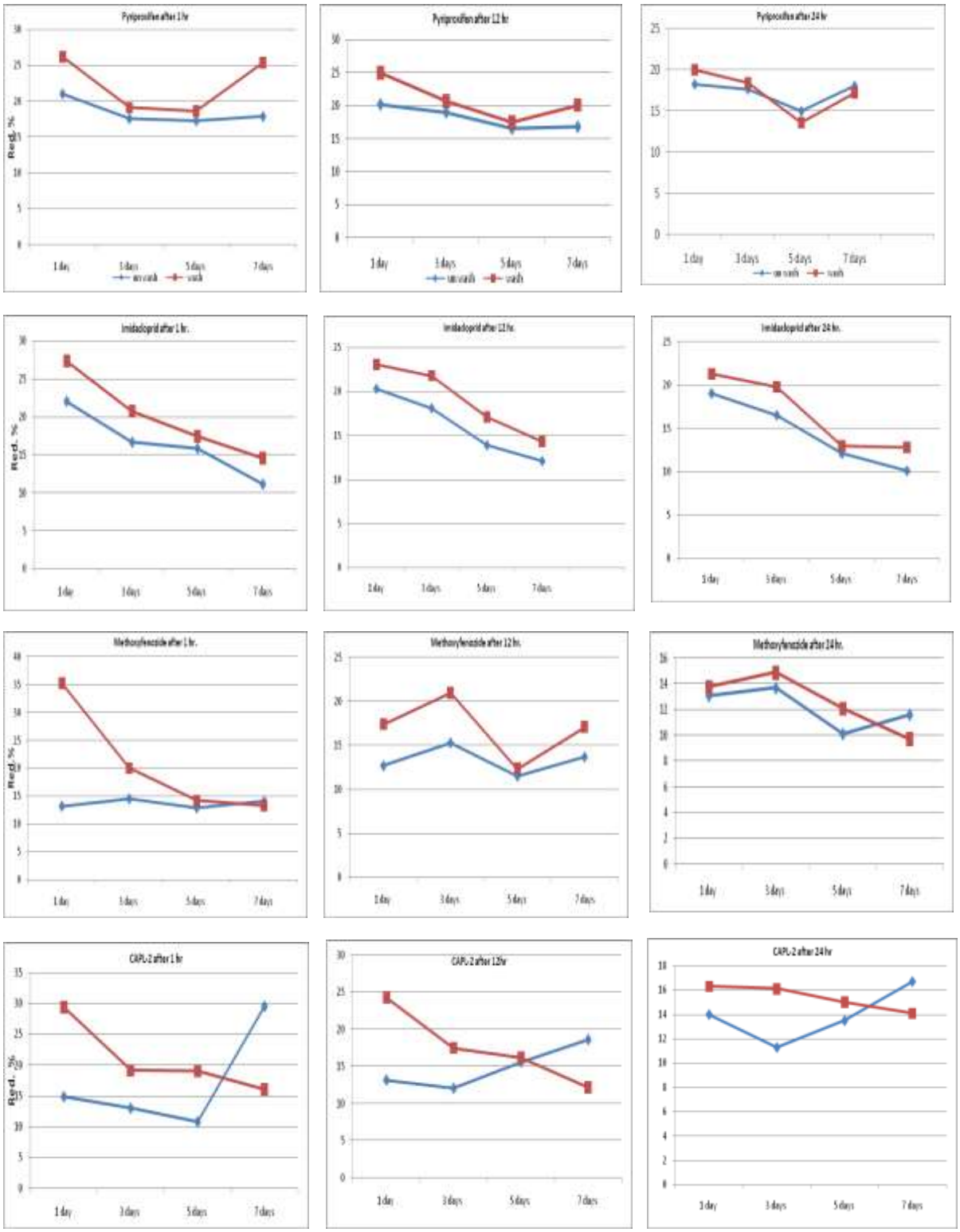

Fig. (3): The difference between two cases (unwash and wash insecticides) after three times of application on parasitoid of *B. tabaci* on bean plants.

DISCUSSION

In the present study, the effect of insecticides washing after application is discussed. These do at the length of washing insecticides application after 1, 12, and 24 hr.

The rate of penetration of an insecticide into the insect integument is associated with its physiochemical properties and with the thickness and chemical composition of the insect cuticle. Washing the insecticides causes change in concentration of treatments. Therefore, since affinity for pesticide to cause its effect ion insect target low. The next generations become more resistance affected with sub lethal dose resulted from wash the treatments from plants. Therefore, this may be one reason of causing rapid change in resistance to pesticides in different agro ecosystems over the generations, due to misuse of insecticides, i.e. using sub-lethal dosages affected with physical factors such as (rainfall, mist, dewy) or any irrigation system causes wash the insecticide application. Therefore, the level of insecticidal activity and selectivity obtained here are not static and can change in space and time, because insects from a single and time point were used, we can not predict what may happen in other areas or with the same area during generations/years to come. Sub-lethal residues of some chemicals have been shown to increase fecundity and female/male ratio pest populations (Dittrich *et al.*, 1974).

Insecticide application recommended refer to the suitable time of application at sunrise (early morning) or before sunset. According to our study we wash after 1, 12 and 24 hr. of application. Wash after 12 hr. is corresponding to natural event due to mist or dewy which causes washing insecticide from plant leaves surface. The statistical analysis showed that, significant difference between two cases of application (unwash and wash) after both 1, 12 hr. on eggs and nymph in all tested compounds but no significant after 24 hr. of washing, except for pyriproxfen gave significant difference after three times of washing on eggs, This may be due to this compounds is Insect Growth Regulator (IGR).

Insecticidal washing causes decrease in efficiency of insecticides against the target (pest), but causes passive effect against the parasitoids. In the same trend Agamy (2003) mentioned that, the pivot irrigation system causes washing of sprayed insecticides from plants. Even the usually of arresting of irrigation for 48-72 hours after pesticide treatments did not increase the pesticide efficacy. Soliman (1998) showed that washing squash fruits with tap water after one day from spray pirimiphos-methyl cause loss from (38.08 unwashed to 7.31 with wash ppm). The side effect of washing insecticides over the plant surface causes stimulation of *B. tabaci* populations by chemical compounds without causes highly reduction %. This may be followed by acceleration or resurgence phenomena (Dittrich *et al.,* 1985), where rebound of population to greater number than before resulted from low reduction %. This push the farmer to use high dosage from insecticides to get good reduction %. These studies are useful predicting the resource the next generation where started with the greater number of eggs and nymphs, which due to affected by pesticide treatment, natural events (rainfall) or mechanical reason (any irrigation system causes washing). Insecticides washing causes decrease in efficiency of insecticides against the target (pest), but causes passive effect against the parasitoids. These can explain, presence the parasite inside the body of B. *tabaci* nymphs give the parasite natural barrier, beside that washing the insecticide causes the decrease of the dose of pesticide which decrease the ability to induce mortality for parasite inside the nymph body of *B.tabaci.*

Washing the insecticide causes unbalancing the density and distribution of insecticides deposits on treated plants. This explain the mistimed application have reversible effect in egg and nymph of *B. tabaci* It is important to note that, the behavioral and biological characteristics of *B. tabaci,* such as short development time, high fecundity, polyphagy and great capacity for dispersion, have contributed to build and development of *B. tabaci* resistance (Ellsworth and Maritinez 2ool; Dittrich *et al.,* 1990 and Dennehy and Williams, 1997).

CONCLUSION

To avoid the insecticides washing must be take in consideration:

1- Cheek the schedule irrigation time of pivot or any irrigation system causes washing the insecticides from plants.

2- Do not apply insecticides at expected rainfall, mist or dewy.

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ARABIC SUMMARY

غسيل المبيدات نتيجة حدث طبيعي أو سبب ميكانيكي وتأثير ذلك على فعاليتها ضد الأطوار غير الكاملة للذبابة البيضاء والطفيليات المصاحبة لها .

همام بخيت همام- محمد حسن عبد الرحمن سليمان - منى عبد الحميد محمد
قسم بحوث آفات الخضر – معهد بحوث وقاية النباتات – دقي – جيزة – ١٢٦١٨ مصر

تظهر كفاءة المركبات الكيميائية عندما تكون المبيدات فعاله ضد الآفات الحشرية وآمنه على الأعداء الحيوية (الطفيليات).

في هذه الدراسة تم استخدام أربعة مركبات سامه هي البيريبروكسيفين ١٠ % EC ، اميداكلوبريد ٢٠% SG ،ميثوكسيفينوذيد ٢٤ %SC ، زيت كابل -٢ EC لإيضاح دور عملية الغسيل للمبيدات بعدساعة و ١٢ ساعة و ٢٤ ساعة من التطبيق و يرجع إلى ظواهر طبيعية (المطر او الضباب او الندى) أو سبب ميكانيكي مثل حالات نظم الري الرزازى المحورى التي تسبب غسيل المبيدات على الأطوار غير الكاملة للذبابة البيضاء والطفيليات المصاحبة *Eretmocerus mundus* , *Encarsia lutea* .

أوضحت نتائج تحليل التباين وجود فروق معنوية بين حالتي التطبيق (عدم غسيل ، غسيل المبيد) بعد ساعة و ١٢ ساعة فى جميع المركبات المختبرة على البيض و حوريات الذبابة البيضاء فيما عدا البيريبروكسيفين اعطى فروق معنوية فى اوقات الاختبار الثلاثة على البيض.

في النهاية الاختلاف في الفروق بين قيم الخفض فى حالتي التطبيق (عدم غسيل و غسيل المبيد) كانت تتراوح بين (١١,٦٨ - ٥٥,٥٧) و (١٧,٣٢ - ٤٣,٤٨)و (٩,٧٧ - ٢٨,٠) بعد ساعة و ١٢ و٢٤ ساعة على التوالى على البيض. و فى حالة الحوريات كانت الفروق تتراوح بين (١٤,٤٩-١٩,٩٨) و(٨,٤١ – ١٦,٥) و (٠,٩٣ -٢,٥٢) بعد ساعة و ١٢و٢٤ ساعة على التوالى. بينما على الطفيليات السابق ذكرها كانت الفروق تتراوح بين (٣,٨ - ٧,٠٢) و(٢,٦٨ - ٢,٩٧) و (٠,١ – ٢,٣) بعد ساعة و١٢ و٢٤ ساعة على التوالى .

تتلخص هذة الدراسة فيما يلى:

لتجنب عملية غسيل المبيدات يراعى الاتى :

١ – مراجعة ميعاد تطبيق الري المحوري مع مواعيد رش المبيدات .

٢ – تجنب رش المبيدات في المواعيد المتوقع فيها سقوط الأمطار او وجود ضباب او ندى.