

## **INFLUENCE OF SOME ADJUVANTS ON EFFICACY OF CERTAIN INSECTICIDES AGAINST ONION THRIPS, *Thrips tabaci* (LIND.) INFESTING ONION AND GARLIC PLANTS**

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### **ABSTRACT**

The effect of two natural agents (as adjuvants) on the efficiency of some insecticides (biofly, malathion, nudrin and challenger) were determined by using pneumatic knapsack motor sprayer (Kubota) at 95 L./ fed. against nymphal and adult stages of *Thrips tabaci* infesting onion and garlic plants. The additives used were bio new film (bnf) and glue. The results indicated an increase of efficiency of the tested insecticides as a result of mixing with these adjuvants. The effect of (malathion, nudrin, challenger and biofly after malathion) at 0.75 recommended rate on the initial percent reduction nymphs and adult stages of *T. tabaci* infesting onion at the 1<sup>st</sup> season seemed to exceed the recommended rate when mixed with (bnf) which caused 59.79, 59.05, 61.84, 51.13 and 59.3, 78.0, 67.5, 48.71 %, respectively.

The same trend were occurred approximately at the 2<sup>nd</sup> season. Also, similar results were recorded on garlic plants at the two studied seasons with slightly increase of efficacy. Bio new film exhibited an increase of initial percent reduction, but glue increased the residual effect. In the respect to the yield of onion and garlic, the highest yield were recorded for plots treated with biofly (3/4R) after malathion (3/4R) mixed with glue (12.69, 12.15 and 12.34, 12.64 ton / fed.) at 1<sup>st</sup> and 2<sup>nd</sup> seasons, respectively, while the lowest yield was recorded for plots were treated with biofly which recorded 8.87, 8.56 and 7.87, 7.98 ton / fed., respectively. Therefore, it could be decided that the adjuvants (glue and bnf) mixed with the tested insecticides (3/4R) lead to high efficacy.

### **INTRODUCTION**

Onion *Allium cepa* L. and Garlic *Allium sativum* L. are considered among the most important field crops cultivated in the world. Both crops liable to attack with many insect pests from seedlings until harvest causing severe damage to the plants and yield. *Thrips tabaci* Lind. is the most damaging insect pest of onion and garlic in all Egyptian regions (Sabra *et al.*, 2007). Because of consuming the fresh green onion and also to avoid chemical control problems, many attempts have been carried out to use non-chemical origin insecticides as a potential components of integrated pest management (Goodwin *et al.*, 2002).

Chemical pesticides are still primary means of pest control, but their use is becoming more controversial. The concept of biocides is being ecofriendly as well as environmental safe and specificity to most of the target pests (Girgis, 2003). Natural products from various plants are a rich source of bioactive substances, which have been exploited as insecticides and or / biologically active components against insect pests (Abo-Sholoha, 1990). Spray adjuvants are chemicals that usually form a part of the formulated insecticides, although, in some circumstances they are added to insecticides tank mix prior to application. These additives may improve mixing with diluting, improve insecticide activity in the field (Omar *et al.*, 2003). Addition

of some adjuvants to pesticide spray solution cause a change in physico-chemical properties and enhance of pesticide efficiency (Nagwa and EL-Sise,1999).

Consequently, use of certain adjutants with synthetic pesticides may decrease their rates of application (EL-Metwally *et al.*,1991). Richard (1974) stated that thickening agents increased the viscosity of spray solution, therefore they reduced the drift and increased the sticking and insecticidal efficiency. Furmidg (1962) concluded that wetting agents decreased the surface tension of spray solution then increased the wet ability ,spreading and depositing on treated surfaces.

The aim of the present work is to study the effect of some local available additives on insecticidal efficiency of biofly, malathion (57%), nudrin (90%SP),challenger(36%SC) against onion thrips attacking onion and garlic plants.

## **MATERIALS AND METHODS**

Two additive agents, new bio (bnf) film and glue(g), were added to four known insecticides, biofly, malathion, nudrin, challenger to control *T. tabaci* on onion (Giza 20) and garlic(Balady) plants. The insecticides were used when the population of thrips was high, at the first half of March 2008 and 2009 seasons .An area of 1/2 feddan for both crop receiving normal agriculture practices was divided into 45 plots of 42 <sup>m</sup>2 each. Two rows between each plots was included as guard rows to prevent the drift of spray solution. Six samples of 10 plants each ( before spraying and at 2,5,8,11 and 14 days after spraying) for each replicate were randomly chosen ,and firstly examined in the field then put in paper bags and examined again in the laboratory using a stereomicroscope to count the existing individuals of thrips inhabiting the apical of plants. Initial effect (2 days after spray ) and residual effect(means of 5,8,11and 14 days after spray) was calculated according to Henderson and Tilton equation(1955).General effect was the means of 2,5,8,11 and 14days after spray. Treatments were arranged in a randomized complete block design. Pneumatic knapsack motor sprayer(Kubota)at95L./Fed. was used.

### **A. The test insecticides :**

#### **1.Biocide:**

Entomofungus *Beauveria bassiana* (Ballsamo):Biofly (2.3x10<sup>7</sup> conidia/ml) 400 ml/fed.

#### **2-Chemical insecticides :**

\* Malathion (malathion 57% E.C.),diethyl (dimethoxy thiophosphor ylthio) succinate. It was provided by Adwia Co. ( ADWIA) 10<sup>th</sup> of Ramadan. Used at 1.0 L./ fed.

\* Nudrin (Methomyl 90% S.P.) N-CC(methylamino) carbonyl oxy ethanimidothioate It was provided by BASFCO. Gernay. Used at 300 gm./fed .

#### **3-The insect growth regulator compound (Challenger 36% S.C.).**

Common name : Chlorfenapyr .

Chemical name: 4-bromo-2-(4- $\alpha$ -lorophenyl)-1-ethoxymethyl-5- trifluoro methylpyrole-3- carbonilrile. It was provided by BASFCO. Germa. 100 ml / fed .

**B. Additives used:**

1. Bio new film (bnf) (spreading and nutrient material) containing 2%  $p_2O_5$ + 3%  $k_2$ + 9% (spreading and wetting agent) produced by Misr El-Dawleia for Agriculture Development .
2. Glue (granules) supplied by El-Sabaa Co., Cairo and used at 3% .

Tank mix method was used for mixing the two tested adjuvants (bnf and g) with the insecticides at the rates of 2% and 3% ,respectively. One type of water was used, the calculated dose of the insecticide was added. Control plots were sprayed with water only .

## RESULTS AND DISCUSSION

The initial and residual effects of the tested insecticides (biofly, malathon ,nudrin and challenger) either alone at the recommended rate or in combination with the tow tested adjuvants bio new film (bnf) and glue (g) against nymphs and adults of *Thrips tabaci* infesting onion and garlic plants could be discussed as follows:

**Onion plants (first season) :**

**1. The initial effect:**

Results in Table (1) indicated that there were significant differences not only between the tested compounds when tested singly but also between them when mixed with the adjuvants . The highest initial effect against nymphs was occurred for the mixture of (challenger +bnf) which recorded 61.84% reduction. However ,the role of the tested adjuvants on the efficiency of toxicants was compounds against the adults was higher in most cases than that against nymphs whether the compounds tested singly or in combination with the two additives .The effect of adjuvants against adults was more obvious than that against nymphs. General effect of the tested insecticides against nymphs and adults was relatively close from each other without any specific effect for these toxicants against the tested insect. Also, the role of the tested adjuvants was relatively limited but they saved 1/4 of the recommended rates Abd-Allah(1999)found that the *Beauveria bassiana* gave poor control against whitefly nymphs infesting cucumber plant.

**2. The residual effect:**

The residual effect was calculated as a mean of total effect after 5,8,11 and 14 days from spraying .

It is clear from the results of Table (1) that the glue adjuvant slightly increased the residual mortality when added to all tested compound of biofly, malathon, nudrin, challenger and (biofly + malathon) which caused 72.72%, 72.22%, 82.27%, 75.91% and 86.72% reduction against nymphal stage and gives 70.05%, 76.12%, 74.45%, 74.9% and 88.99% reduction against adult stage, respectively, similar trend were also recorded for the other adjuvant against both nymphes and adults (Table 1) .Sticker in the spray solution at the rate of 500 ml / feddan protected carbaryl residual from rapid decrease

(EL-Sayed *et al.*,1969. As for the general effect, the highest percent reduction was occurred for biofly(3/4R) + malathon+ bnf (b +m + bnf) against nymphs and biofly (3/4R) + malathon +glue ( b+m+g) against adults which recorded 79.41and 79.1%reduction of population, respectively. Similar results were reported by Betana *et al.* (2004) who found that the inclusion of some adjuvant (glow) in spray emulsions of esfenvalerate and profenfos at their full and half recommended field rates, enhanced the activity of the tested insecticides at half recommended rate.

**Table (1): Efficiency of the tested insecticides at the recommended rate or at the 3/4 recommended rate plus the two adjuvants against nymphs and adults of *T.tabaci* infesting onion plants and yield at 2008 season .**

Treatments	Rate of application/ fed	Nymphs			Adults			Yield
		Initial Effect %	M. of resid. %	General effect %	Initial effect %	M. of resid. %	General effect %	
Biofly(R)	400ml/fed.	24.48 <sup>n</sup>	67.6e	58.98h	43.75g	63.38d	59.31e	8.87 f
Biofly (3/4R)+bnf	300ml/fed.	31.75 <sup>o</sup>	70.65de	62.83g	44.29g	68.38c	63.56d	9.10 f
Biofly(3/4R)+glue	300ml/fed.	38.32 <sup>f</sup>	72.72cd	65.84fg	48.95f	70.05c	65.83d	9.15 ef
Malathon(R)	1L./fed.	54.47 <sup>c</sup>	70.32de	67.75ef	41.07h	70.12c	64.31d	9.48 e
Malathon(3/4R)+ bnf		59.79 <sup>ab</sup>	72.58CD	70.02cde	59.3d	75.5b	72.26bc	10.45d
Malathon(3/4R)+glue		54 <sup>c</sup>	72.22CD	68.58def	58.76d	76.12b	72.7bc	11.20c
Nudrin(R)	300ml/fed.	56.28 <sup>c</sup>	73.78CD	70.28cde	64.47c	73.59bc	71.77bc	11.35c
Nudrin(3/4R)+ bnf		59.05b	81.82b	77.27ab	78a	69.72c	71.38bc	11.98b
Nudrin(3/4R)+glue		56.12c	82.27b	77.04ab	69.85b	74.45b	73.53b	12.0 b
Challenger(R)	100ml/fed.	54.41c	70.86de	67.91ef	53.85e	72.96bc	69.14c	10.35 d
Challenger(3/4R)+ bnf		61.84a	74.01cd	71.57cde	67.5b	73.95bc	72.66bc	11.78 b
Challenger(3/4R)+glue		56.17c	75.91c	71.96cde	64.07c	74.9b	72.73bc	11.9 b
Biofly(3/4R)+ Malathon(3/4R)		45.98e	80.59b	73.66cd	47.86f	85.86a	78.26a	12.3 a
Biofly(3/4) + Malathon (3/4R)+bnf		51.13d	86.48a	79.41a	48.71f	76.41b	70.87bc	12.11 b
Biofly(3/4R)+ Malathon (3/4R)+glue		49.64d	86.72a	79.3a	39.58h	88.99a	79.1a	12.69 a
Check treatment								8.21 g
						3.786	3.222	0.359

**Onion plants (second season ) :**

**1. The initial effect:**

Data in Table (2) revealed that the highest initial effect was occurred by (challenger +bnf )against nymphal and adult stages which recorded 80.08 and 75.81%reduction, respectively.

**2. The residual effect :**

The results in Table (2) indicated that the addition of glue to the tested compounds (except challenger) were more active than other mixtures with respect to their efficacy against thrips nymphs which recorded the highest reduction percentages, 70.66%, 66.09%, 76.68%, 76.08% and 78.22% reduction, for biofly, malathon, nudrin and mixture of malathon +biofly respectively.

The same results were also occurred against adult stage of thrips except biofly when mixed with glue. The present results go in line with those reported by Nagwa and EL-Sisi 1999) who founds that the effect of Merlene and Sumialpha at half recommended rate plus on the initial mortality of the 2<sup>nd</sup> instar larvae of *Spodoptera littoralis* seemed to be nearly to that of the complete recommended rate. It seems also that biofly induced a high residual effect. The obtained data agree with those obtained by EL-Mezayyen *et al.* (2003) who stated that fenvalerate when mixed with biofly and kz oil, and atabron alone exhibited high reduction against jassid which caused 92.19, 87.92, and 83.71 % reduction, respectively.

**Table (2): Efficiency of the tested insecticides at the recommended rate or at the 3/4 recommended rate plus the two adjuvants against nymphs and adults of *T. tabaci* infesting onion plants and yield at 2009 season .**

Treatments	Rate of Application /fed.	Nymphs			Adults			Yield
		Initial Effect %	M. of resid. %	General effect %	Initial Effect %	M. of resid. %	General effect %	
Biofly(R)	400ml/fed	32.71 <sup>h</sup>	58.35 <sup>h</sup>	52.72 <sup>h</sup>	28.5 <sup>k</sup>	71.93 <sup>efg</sup>	63.24 <sup>e</sup>	8.56 g
Biofly (3/4R)+bnf	300ml/fed	33.00 <sup>h</sup>	61.1 <sup>gh</sup>	55.48 <sup>g</sup>	29.83 <sup>k</sup>	73.87 <sup>de</sup>	65.06	8.91 fg
Biofly(3/4R)+glue	300ml/fed	41.83 <sup>g</sup>	70.68 <sup>e</sup>	64.91 <sup>e</sup>	33.15 <sup>j</sup>	72.82 <sup>ef</sup>	64.88 <sup>de</sup>	10.15 e
Malathon(R)	1L./fed.	41.24 <sup>g</sup>	60.8 <sup>gh</sup>	56.89 <sup>g</sup>	51.25 <sup>h</sup>	69.97 <sup>fg</sup>	65.41 <sup>de</sup>	9.01 f
Malathon (3/4R) + bnf		44.75 <sup>f</sup>	63.37 <sup>fg</sup>	59.81 <sup>f</sup>	64.45 <sup>ef</sup>	74.16 <sup>de</sup>	72.22 <sup>c</sup>	9.15 f
Malathon(3/4R)+glue		43.53 <sup>g</sup>	66.09 <sup>f</sup>	61.58 <sup>f</sup>	59.58 <sup>g</sup>	76.66 <sup>cde</sup>	74.45 <sup>c</sup>	10.10 e
Nudrin(R)	300gm/fed.	68.13 <sup>d</sup>	71.81 <sup>de</sup>	71.01 <sup>cd</sup>	67.5 <sup>cd</sup>	77.27 <sup>bcd</sup>	75.32 <sup>bc</sup>	11.63 bc
Nudrin(3/4R)+ bnf		78.26 <sup>ab</sup>	75.46 <sup>abc</sup>	71.02 <sup>a</sup>	74.74 <sup>a</sup>	78.94 <sup>bc</sup>	78.1 <sup>ab</sup>	12.03 ab
Nudrin(3/4R)+glue		70.7 <sup>d</sup>	76.68 <sup>ab</sup>	75.48 <sup>ab</sup>	70.11 <sup>b</sup>	79.06 <sup>bc</sup>	77.27 <sup>ab</sup>	11.95 <sup>ab</sup>
Challenger(R)	100ml/fed.	76.29 <sup>b</sup>	71.87 <sup>de</sup>	72.75 <sup>c</sup>	62.63 <sup>f</sup>	68.47 <sup>g</sup>	67.3 <sup>d</sup>	10.82 d
Challenger(3/4R)+ bnf		80.08 <sup>a</sup>	76.08 <sup>ab</sup>	76.87 <sup>a</sup>	75.81 <sup>a</sup>	72.5 <sup>ef</sup>	73.17 <sup>c</sup>	11.71 <sup>bc</sup>
Challenger(3/4R)+glue		73.45 <sup>c</sup>	72.84 <sup>cde</sup>	72.96 <sup>bc</sup>	65.92 <sup>de</sup>	73.11 <sup>ef</sup>	71.67 <sup>c</sup>	11.43 c
Biofly(3/4R)+ Malathon (3/4R)		44.41 <sup>f</sup>	75.44 <sup>abc</sup>	69.23 <sup>d</sup>	45.4 <sup>i</sup>	79.52 <sup>b</sup>	72.7 <sup>c</sup>	12.04 ab
Biofly (3/4) + Malathon(3/4R)+bnf		55.62 <sup>e</sup>	74.3 <sup>bcd</sup>	70.57 <sup>cd</sup>	68.33 <sup>bc</sup>	83.18 <sup>a</sup>	80.21 <sup>a</sup>	11.63 cd
Biofly (3/4R) + Malathon(3/4R)+glue		53.36 <sup>e</sup>	78.22 <sup>a</sup>	73.25 <sup>bc</sup>	63.44 <sup>f</sup>	84.82 <sup>a</sup>	80.54 <sup>a</sup>	12.15 a
Check treatment								8.05 h
L.S.D.0.05%		2.734	2.888	2.436	2.237	3.39	3.444	0.370

**Garlic plants (first season):**

**1. The initial effect:**

Data in Table (3) revealed that , the two tested adjuvants increased the efficiency of the tested compounds against both stages of *T. tabaci* in compared with the compounds alone. The highest mixture was nudrin + bnf while biofly (R) was the lowest one against nymphs and adult stages. Similar results were obtained by Ahmed (1992) who reported that the initial and residual activities of malathon either alone or in binary mixtures with zylex foliar fertilizer induced high initial and bio-residual activity against thrips infesting cucumber, vegetable marrow and tomato. It shows that, binary mixtures of biofly and malathon + adjuvants were not effective (antagonist) against the insects.

**Table (3): Efficiency of the tested insecticides at the recommended rate or at the 3/4 recommended rate plus the two adjuvants against nymphs and adults of *T.tabaci* infesting garlic plants and yield at 2008 season.**

Treatments	Rate of application	Nymphs			Adults			Yield
		Initial effect %	M.of resid.%	General effect%	Initial effect %	M.of resid.%	General effect%	
Biofly(R)	ml/fed. 400	13.48j	62.09c	47.46g	12.84k	52.29g	44.39g	7.87f
Biofly (3/4R)+bnf	ml/fed. 300	19.02i	55.96de	55.3de	24.45i	63.19f	55.44f	9.0 e
Biofly(3/4R)+glue	300ml/fed.	14.31j	56.75d	48.26g	19.17j	53.38g	46.54g	8.8 e
Malathon(R)	1L./fed.	55.62c	53.73ef	48.19g	38.57h	66.18ef	60.66e	9.05 e
Malathon(3/4R)+ bnf		59.62b	49.47g	54.89de	43.91f	71.96cd	66.75cd	10.2 d
Malathon(3/4R)+glue		51.76de	58.19d	56.9cd	43.07g	72.9c	66.93cd	11.3 b
Nudrin(R)	300gm/fed.	52.73d	47.4g	48.47fg	52.61cd	68.47de	65.99d	10.3 d
Nudrin(3/4R)+ bnf		65.73a	47.26g	50.95fg	54.11c	74.47bc	70.4bc	10.98 bc
Nudrin(3/4R)+glue		56.55c	52.16f	53.06ef	48.07ef	77.47ab	71.59ab	12.17a
Challenger(R)	100ml/fed	47.29fg	64.8bc	61.3ab	61.54b	72.14cd	70.02bcd	12.01 a
Challenger(3/4R)+ bnf		56.61c	62.98bc	61.71ab	66.97a	77.17ab	75.13a	11.98 a
Challenger(3/4R)+glue		52.85d	65.46b	62.89a	54.52c	78.57a	73.72ab	12.19 a
Biofly (3/4R) + Malathon (3/4R)		46.56g	62.12c	59.01bc	46.34f	62.35f	59.15e	10.8 c
Biofly (3/4) + Malathon(3/4R)+bnf		49.83ef	65.23bc	62.15abc	50.46de	70.49cd	66.49cd	12.0 a
Biofly (3/4R) + Malathon(3/4R)+glue		43.29h	68.89a	63.77a	46.17f	65.03ef	61.26e	12.34a
Check treatment								7.23 g
L.S.D.0.05%		2.623	2.534	3.363	2.398	3.721	3.708	0.36

Generally the binary mixture of myco-insecticide plus malathon at its recommended rate gave acceptable to good control till the experimental end time after 12 days.

## 2. The residual effect:

Data presented in Table (3) showed generally the tested compounds and their mixtures with the tested additives were more toxic to adults than to nymphs. challenger and nudrin I recorded the highest residual effect against adults but that biofly (R) against both nymphs and thrips adults was occurred the lowest mean residual effect specially against adults but challenger only against nymphs. The efficiency was enhancement (synergist) when biofly was mixed with malathon and both glue or bnf which recorded 68.89% and 65.23 in nymphs & 65.03% and 70.49% reduction in adults, respectively. Abd-Allah, (1999) conducted in field experiments to evaluate the efficacy of smallest amounts from carbosulfan (i.e. 0.75 and 0.5 R) in the mixture latent the good performance of the mixture to exert good control of whitefly nymphs and adult) on cucumber plants. Also, Ford and Salt (1990), reported that the manner in which an agro-chemical is deposited on plant surface can determine its effectiveness as a crop protectant.

Data in Table (3) revealed generally challenger was the most effective compound against nymphs and adult of thrips attacking garlic whether to used alone or combined with the two additives. Abd EL-All (1988) illustrated that, beside the basic active ingredient, adjuvant (Polyethylene glycol-600-mono oleate, Egyptool B.I.M. 25 % and Calcium dodecyl benzene

sulfonate)are used to increase the biological activity of pesticides. They are included in almost all commercial pesticide formulations.

**Garlic plants (second season) :**

Results in Table (4) indicated generally that bnf and glue when combined with all the tested insecticides induced high level of reduction of insect population as initial effect or as residual effect.

**Table (4): Efficiency of the tested insecticides at the recommended rate or at the 3/4 recommended rate plus the two adjuvants against nymphs and adults of *T.tabaci* infesting garlic plants and yield at 2009 season.**

Treatments	Rate of application	Nymphs			Adults			Yield
		Initial effect%	M.of resid.%	General effect%	Initial effect%	M.of resid.%	General effect%	
Biofly(R)	ml/fed. 400	31.4 <sup>st</sup>	76.93 <sup>d</sup>	67.84 <sup>f</sup>	36.72 <sup>l</sup>	71.91 <sup>t</sup>	64.92 <sup>g</sup>	7.98 j
Biofly (3/4R)+bnf	ml/ fed. 300	40.17 <sup>h</sup>	80.9 <sup>c</sup>	72.75 <sup>e</sup>	40 <sup>i</sup>	79.43 <sup>cd</sup>	71.54 <sup>e</sup>	9.34 h
Biofly(3/4R)+glue	300ml/fed.	41.26 <sup>h</sup>	75.27 <sup>d</sup>	68.43 <sup>f</sup>	34.7 <sup>l</sup>	75.52 <sup>ef</sup>	67.36 <sup>f</sup>	9.0 i
Malathon(R)	1L./fed.	59.92 <sup>f</sup>	77.08 <sup>d</sup>	73.65 <sup>e</sup>	55.81 <sup>g</sup>	71.46 <sup>f</sup>	68.33 <sup>e</sup>	9.21 hi
Malathon(3/4R)+ bnf		73.34 <sup>b</sup>	87.32 <sup>b</sup>	84.52 <sup>bc</sup>	70.68 <sup>c</sup>	72.39 <sup>f</sup>	72.04 <sup>e</sup>	10.68fg
Malathon(3/4R)+glue		67.13 <sup>e</sup>	87.5 <sup>b</sup>	83.43 <sup>c</sup>	65.86 <sup>d</sup>	73.02 <sup>f</sup>	71.59 <sup>f</sup>	10.62 g
Nudrin(R)	gm/fed.300	58.27 <sup>c</sup>	90.97 <sup>a</sup>	84.43 <sup>bc</sup>	58.11 <sup>g</sup>	80.85 <sup>bcd</sup>	67.3 <sup>d</sup>	10.7 fg
Nudrin(3/4R)+ bnf		72.16 <sup>bc</sup>	93.75 <sup>a</sup>	89.34 <sup>a</sup>	64.34 <sup>ed</sup>	83.19 <sup>bc</sup>	79.42 <sup>cd</sup>	10.91ef
Nudrin(3/4R)+glue		67.32 <sup>e</sup>	94.55 <sup>a</sup>	89.1 <sup>a</sup>	59.0 <sup>g</sup>	89.65 <sup>a</sup>	83.52 <sup>b</sup>	12 abc
Challenger(R)	ml/fed. 100	68.05 <sup>de</sup>	78.3 <sup>cd</sup>	77.79 <sup>d</sup>	74.42 <sup>b</sup>	84.95 <sup>b</sup>	82.84 <sup>bc</sup>	11.73 d
Challenger(3/4R)+ bnf		70.3 <sup>d</sup>	80.62 <sup>c</sup>	78.56 <sup>d</sup>	79.87 <sup>a</sup>	90.55 <sup>a</sup>	88.41 <sup>a</sup>	11.83bcd
Challenger(3/4R)+glue		68.82 <sup>de</sup>	81.68 <sup>c</sup>	79.1 <sup>d</sup>	72.31 <sup>bc</sup>	92.8 <sup>a</sup>	88.7 <sup>a</sup>	12.06ab
Biofly (3/4R) + Malathon(3/4R)		54.95 <sup>g</sup>	91.64 <sup>a</sup>	86.97 <sup>a</sup>	45.52 <sup>h</sup>	77.31 <sup>def</sup>	70.95 <sup>ef</sup>	11.0 e
Biofly (3/4) + Malathon(3/4R)+bnf		78.18 <sup>a</sup>	91.62 <sup>a</sup>	88.93 <sup>ab</sup>	62.05 <sup>ef</sup>	79.91 <sup>cde</sup>	76.33 <sup>d</sup>	11.8 cd
Biofly (3/4R) + Malathon(3/4R)+glue		72.58 <sup>bc</sup>	91.7 <sup>a</sup>	88.54 <sup>a</sup>	69.82 <sup>c</sup>	82.94 <sup>bc</sup>	80.31 <sup>bcd</sup>	12.64 a
Check treatment								7.62 k
L.S.D.0.05%		2.436	2.363	3.044	3.335	4.213	3.729	0.225

Generally effect of the tested insecticides when mixed with the adjuvants exceeded pronouncedly that induced when used singly whether against nymphs or against adults . It is also showed that reduction percentages recorded in this season were relatively higher than that of the previous season (2008) . These results agree with those obtained by Bargar (1984) were found that sprays of methoxychlor at various concentrations with applied by a hydrolic sprayer to American elemis, *Ulmus Americana* in different seasons and localities were significantly affected by addition of stickers. The obtained results agree with those of Brady *et al.*,(1980) who reported that sticker adjuvant including oxal,new film 17,plant card ,plyace stretcher and triton x-100 could be used for increasing the persistence of chlorpyrifos and chlorpyrifos-methyl.

**Effect of treatments on yield :**

**1. On onion:**

Data in Tables (1 and 2) showed that the yield of all treated plots were increased significantly in comparable with untreated ones .It could be classified into three categories, the 1<sup>st</sup> for mixture of (biofly and malathon) and nudrin plus both bnf, glue with yield about 11.63 and 12.69 ton/fed. for the two seasons, respectively; the 2<sup>nd</sup> which occupied malathon +bnf and biofly +glue with about 9.01 and 10.45 ton/fed. for the two seasons, respectively; the last group had the rest treatments (between 8.56 – 9.0 ton/fed.).

**2. On garlic :**

The relatively high yield of garlic was occurred for plots treated with malathon mixed with both bnf or glue, nudrin, challenger and (biofly + malathon) ranged between 10.3- 12.34 ton/fed. compared with 7.23 – 7.62 ton/fed. for untreated plots during the two seasons while the rest compounds ranged between 7.87–10.2 ton/fed. at two seasons.

Finally the adjuvants have the ability to increase viscosity of spray liquids and significantly reduce small droplets. Therefore, they are successful thickening agents for flowable formulations (Abd El-All,1988). The high potency of the glue mixed with some tested compounds may be due to adhesive force of the droplets of the aqueous solution on the treated surfaces accordingly the deposit ratio increase Frear,1955).Also,(Soliman,2002) found that, viscosity ratio increased when carbosulfan at half recommended rate was mixed with glue. On the other hand, Bio new film (spreading, wetting and nutrient materials) enhanced the system defense in the plant. (Abd-Allah,1999)found that the binary mixture of the biofly plus foliar fertilizer (Stumo-Green) which containing 10% potassium and 1.5% phosphorus induced high residual activity against whitefly infesting cucumber. The effect of both Merlene and Sumialpha at half recommended rate of application plus glue against *Spodoptera littoralis* seemed to be nearly to that of the complete recommended rate with free additives, this changes in insecticides properties led to increase their retention and insecticides efficiency (Nagwa *et al.* 1999). It could be also, concluded that controlling *T. tabaci* depends mainly on the adjuvants with little rates of insecticides. These information's indicated that, the %reductions were resulted from the arrival and homogenous coverage of spraying solution to the places inhabits the immature stages of the thrips.

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## تأثير بعض الإضافات على فاعلية بعض المبيدات الحشرية ضد تربس البصل (*Thrips tabaci* Lind.) الذي يصيب نباتات البصل و الثوم

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لتنجيب مشاكل مكافحة الكيماوية تم تقييم دور بعض الإضافات الطبيعية والمخلوطة بالعناصر المغذية (نتروجين ، فسفور ، بوتاسيوم ) في التأثير على الخواص الطبيعية الكيماوية لمستحضرات بعض المبيدات وبالتالي زيادة فعالية المبيد ضد الآفة وطول فترة بقاؤه فعلاً وما لذلك من آثار إقتصادية وبيئية جيدة .

تم تقدير تأثير اثنين من المواد الإضافية (الغراء ، بيونيو فيلم) على سمية بعض المبيدات الحشرية (بيوفلاي ، مالاسون، نيودرين، منظم النمو الحشري تشالنجر) عند التركيز الموصى به وعند ٤/٣ التركيز الموصى به بالإضافة إلى الفعل المشترك بين كل من بيوفلاي ، و المالاسون عند ٤/٣ التركيز الموصى به وذلك باستخدام الرشاشة الظهرية كوبوتا بمعدل ٩٥ لتر ماء/ فدان حيث قدر كل من التأثير الأولي والتأثير المتبقي لهذه المركبات ضد الحوريات والأطوار الكاملة لحشرة تربس البصل التي تصيب البصل والثوم .

تشير النتائج المتحصل عليها إلى زيادة فعالية المركبات المختبرة عند ٤/٣ التركيز الموصى به نتيجة خلطها بالبيونيو فيلم والغراء ففي موسم الدراسة الأول على البصل حققت المركبات المختبرة مالاسون، نيودرين، تشالنجر و(بيوفلاي + مالاسون) مع إضافة بيونيو فيلم تأثير أولي ٧٩,٥٩%، ٥٩,٥٩%، ٦١,٨٤%، ٥١,١٣% و ٥٩,٣٠%، ٧٨,٥%، ٦٧,٥%، ٤٨,٧١% إنخفاضاً في تعداد الحوريات والحشرات الكاملة على التوالي، بينما زاد التأثير المتبقي حيث سببت ٧٢,٥٨%، ٨١,٨٢%، ٧٤,٠١% و ٨٦,٤٨% إنخفاضاً في تعداد الحوريات والحشرات الكاملة على التوالي وفي الموسم الثاني كانت النتائج في نفس المسار تقريباً.

أما نتائج المركبات المختبرة على الثوم فكانت نسب الإنخفاض في التعداد أعلى قليلاً عنها في البصل . ومن الواضح أيضاً أن هذه المركبات كان لها تأثير أولى عالي بخلطها بمادة بيو نيوفيلم فسجل نيودرين ضد الحوريات عند ٤/٣ التركيز الموصى به ٦٥,٧٣% بينما كان لها تأثير متبقي عالي عند خلطها بالغراء فسجل تشالنجر ضد الأطوار الكاملة ٧٨,٥٧% في الموسم الأول، أما الموسم الثاني فسجل (بيوفلاي + مالاسون) مخلوطان بكل من بيونيو فيلم أو الغراء ٩١,٦٢%، ٩١,٧% و ٩٢,٨%، ٩٠,٥٥% و ٩٢,٨% على التوالي وهذا يكون ناتج عن التغطية المنتظمة لمحلل الرش والتصاق القطيرات على أسطح الأوراق المعاملة والوصول إلى أماكن تواجد الآفة .

أوضحت نتائج التحليل الإحصائي لبيانات المحصول وجود اختلافات معنوية بين متوسطات المحصول الناتج بين المعاملات وبعضها والقطع الغير معاملة حيث سجل أعلى محصول ١٢,٦٩ و ١٢,١٥ طن/فدان للبصل و ١٢,٣٤ ، ١٢,٠٨ طن/فدان للثوم في القطع التي تم رشها بالمركبات (بيوفلاي + مالاسون + بيونيو فيلم ) مقارنة بتلك الغير معاملة (٨,٠٥، ٨,٢١ طن/ف ) و (٢٣,٧ و ٦٢,٧ طن/ف) في كل من موسمي الدراسة على التوالي بينما كانت القطع المعاملة بالبيوفلاي أقل إنتاجية، ولذلك يمكن خلط المواد الإضافية (الغراء وبيونيو فيلم ) مع ٤/٣ المعدل الموصى به يؤدي إلى الحصول على فاعلية أعلى للمركب.

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