

SIDE EFFECT OF CERTAIN SEX PHEROMONE FORMULATIONS AND / OR PROFENOFOS INSECTICIDE ON SOME NON TARGET INSECTS.

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ABSTRACT

Field experiments were carried out at the Experimental Farm, Faculty of Agriculture, Saba Basha, Alexandria University during two successive growing cotton seasons 1999 and 2000 to evaluate the side effect of three pheromone Formulations and / or profenofos insecticide in special regimes on spiny bollworm *Earias insulana* (Boisd.) as non target insect. In addition the side influence of the treatments were assessed on some predators. The experiments revealed the following results:

1. It was found that the lowest seasonal mean numbers of inspected spiny bollworm Larvae (4.03, 4.42 larvae / 100 bolls) in the profenofos (Curacron) insecticide treatment while it was (4.16,5.15 in T₁, 5.33, 6.06 in T₂ and 5.39,5.52 larvae / 100 bolls in T₃ during the seasons of 1999 and 2000, respectively).
2. There was no significant difference between the three cultivars of cotton (Giza70 , Giza88 and Giza89) .
3. The results showed that the population densities of prevailing and common predators were about 3-7 folds in pheromone / insecticide – treated areas compared with the insecticide treatment during the study. The highest percent values of the total inspected predators were (22.39, 21.81 and 21.02) during season 1999, and (23.23, 22.51 and 23.4%) during season 2000 on Giza70, Giza88 and Giza89 in T₁ (PB- Rope / curacron / selibate / curacron) followed by 18.91, 18.76, 20.2% in T₃ (selibate / curacron/last flight / curacron) in season 1999; 19.01 , 18.1 and 19.0% in season 2000 in Giza 70, Giza 88 and Giza 89 , respectively. The lowest percent values were obtained in insecticide treatment were (13.9,13.47 and 13.36) in season 1999; 10.29, 11.27 and 11.29 in season 2000 on the three mentioned cultivars respectively .
4. True spiders, *Chrysopa* spp. And *Orius* spp. were dominant in pheromone and / or insecticide- treated areas. The most susceptible species of predators for the insecticide application were *peadrus* spp., *Coccinella* spp. And *Scymnus* spp.

INTRODUCTION

The extensive use of pesticides in cotton fields has seriously affected the population densities of natural enemies to develop resistance to certain pesticides. Therefore, pheromones could be applied as a part of population suppression programme , for cotton pests, especially against pink bollworm. Since they are specific for the target insect-pest without causing drastic side effect on beneficial insects, i.e., parasitoids and predators (El-Adl *et al.*, 1998 and Moawad *et al.*, 1992).

This study aims to evaluate one of the modern concepts of pest control in defending the cotton crop against the spiny bollworm, whereas three sex pheromone formulations were used early in the season followed by two applications of conventional insecticides to see their effect on the non

target pest spiny bollworm and their resulting side effects on some predatory insects (Al-Beltagy, 1999; Kostandy, 1995).

MATERIALS AND METHODS

1. Field trials :

The field experiments were carried out at the Agriculture Research Farm, Faculty of Agriculture (Saba Basha), Alexandria. University, Egypt. The experimental area was cultivated with three cotton varieties (cultivars) ; Giza70, Giza88 and Giza89, on April 1999 and 2000 seasons .

The experiments was designed for evaluating three commercially registered slow release pheromone formulations and / or organophosphorous insecticide (curacron) against the pink bollworm; *Pectinophora gossypiella* (Saunders) , and the spiny bollworm, *Earias insulana* (Boisd.).

2. Treatment and rate of application in the field trials:

Table (1) shows the treatments, dates and rates of application during the growing seasons of 1999 and 2000 .

Table(1): Treatments and rate of application in field trials.

Treatment And dates	Application No. (Date – Rate of application / feddan)			
T1 1999 2000	Rope- PBW 300 dispensers 19-6 19-6	Profenophos72% E.C 750ml 5-8 8-8	Selibate 100 rings 22-8 23-8	Profenophos72% EC 750ml 9-9 9-9
T2 1999and 2000	Last-Flight 300 drops 19-6	Profenophos72%E.C 750ml 25-7	Selibate 100 rings 13-8	Profenophos72% EC 750ml 9-9
T3 1999 and 2000	Selibate 100 rings 19-6	Profenophos72%E.C 750 ml 25-7	Last-Flight 300 drops 13-8	Profenophos72% EC 750ml 29-8
T4 1999 and 2000	Profenophos72%E.C 750 ml 10-7	Profenophos72%E.C 750 ml 31-7	Profenophos72%E.C 750 ml 19-8	Profenophos72%E.C 750 ml 4-9
T5 Check Untreated	-	-	-	-

2.1. Treatment 1 (T1):

- A. An application of PB-rope was applied at the rate of 300 dispensers/ feddan throughout the period from 19th June, to 5th August in season 1999 and to 8th august in 2000 season .
- B. Profenophos (Curacron 72% E.C) was sprayed at the rate of 750 ml/ feddan as recommended.
- C. Selibate pheromone was applied on 22th August in the season of 1999 and on 23rd August in the 2000 season . Selibate was applied at the rate of 100 rubber rings /feddan .

- D. Spraying (curacron) profenophos at the rate of 750 ml / feddan on 9th Sept. during the 1999 and 2000 seasons.

Treatment T1 was applied for the three cotton cultivars (Giza70, Giza88 and Giza89).

2.2 Treatment (T2):

- A. The Last flight pheromone was applied in form of drops on the top of cotton leaf at a rate of 300 drops / feddan during the two seasons.
B. Selibate pheromone was applied first followed by profenophos at the rate of 750 ml/feddan on the 29th August, for the two seasons. Treatment T2 was applied for the three cotton cultivars

2.3 Treatment (T3)

Selibate was applied at the rate of 100 rings / feddan then the insecticide at the rate of 750 ml / feddan on 25th July of the two seasons. Finally profenophos was sprayed on 29th August of 1999 and 2000 seasons. This treatment was applied for the 3 cultivars of cotton (Giza70, Giza88 and Giza89).

2-4 Treatment (T4):

Profenophos at a rate of 750ml/ feddan was sprayed on July, 10th and 31st, on August 19th and Sept. 4th during the two growing seasons. This treatment was applied for the 3 cotton cultivars of cotton.

2-5- Treatment (T5):

Check untreated: neither pesticide nor pheromone was incorporated during the study.

3. Estimation of cotton bollworms infestation :

The infestation levels of the studied pests were determined by taking random samples of green bolls. Sampling lasted for a period of 12 weeks. The samples were examined externally before dissection and internal inspection. Infestation records were based on the existence of injury symptoms regardless the presence of Larvae. Analysis of variance using "F" and "L.S.D" tests was used for the comparisons among treatments.

4. Impact of the treatments upon certain predators of the cotton pests :

Weekly inspections were carried out in the field for detecting the main prevailing predators in cotton fields. The direct counting method (Hafez, 1960) was applied in sampling of 20 cotton plants at random for each replicate. The inspected predators were *chrysopa carnea* (egg and Larvae), *Coccinella spp.*, *Orius spp.*, *Scymnus Spp.*, *Paederus affienii* and true spiders. Counts were done weekly along the sampling periods of 14 weeks during the growing seasons of 1999 and 2000.

RESULTS AND DISCUSSION

I- Influence of consequent application of sex pheromone formulations and/or insecticide on spiny bollworm infestation.

The data given in Table (2) show the seasonal mean numbers of spiny bollworm during the growing cotton seasons of 1999 and 2000.

The results indicated that there were significant difference between the seasonal mean numbers of spiny bollworm larvae in the areas treated with the insecticide alone, the other area treated with pheromone/insecticide and untreated check and also between the three cultivars (Giza70, Giza88 and Giza89). It is evident that T4 treatment (insecticide alone) was the most effective treatment to protect the bolls from infestation, (spiny bollworm larvae were 4.03&4.42 larvae/ 100 bolls).

The remaining treatments, T₁(Rope-PBW/ curacron /selibate/ curacron), T₃ (selibate / curacron / last flight / curacron) and T₂ (last flight / curacron / selibate / curacron) gave (4.16&5.15) , (5.39&5.52) and 5.33&6.06) (larvae/100 bolls) compared with those of 7.80 & 7.51 larvae/ 100 bolls in the untreated check treatment in both seasons, respectively.

Table (2): Mean numbers of *Earias insulana* (Boisd.) larvae at the different treatments in the three cultivars during season 1999 And 2000.

Treatments	Variety			Mean Treatments
	Giza70	Giza88	Giza89	
Rope PBW/Curacron/Selibate/ Curacron(T1)	4.00	3.25	5.25	4.16(a)
Last-flight/Curacron/Selibate/ Curacron(T2)	5.58	4.42	6.00	5.33(b)
Selibate/Curacron/Last.Flight/ Curacron(T3)	5.00	5.17	6.00	5.39(b)
Curacron(T4)	4.33	4.25	3.50	4.03(a)
Untreated Check(T5)	7.75	7.08	8.58	7.80(c)
Mean cultivar	5.33(a)	4.83	5.87(a)	

Treat.x Var:F=4.74***
L.S.D.0.02=0.89

Treatments	Variety			Mean Treatments
	Giza70	Giza88	Giza89	
Rope PBW/Curacron/Selibate/ Curacron(T1)	4.83	4.75	5.83	5.15(b)
Last-flight/Curacron/Selibate/ Curacron(T2)	5.67	5.91	6.58	6.06(c)
Selibate/Curacron/Last.Flight/ Curacron(T3)	5.67	5.08	5.83	5.52(b)
Curacron(T4)	4.58	3.75	4.92	4.42(a)
Untreated Check(T5)	7.67	6.67	8.25	7.15(d)
Mean cultivar	5.68(a)	5.22(a)	6.29(a)	5.73

Treatments:F=52.97***
L.S.D.0.02=0.4457

On the other hand, the infestation with the spiny bollworm *Eairias insulana* in the pheromone / insecticide- treated areas was higher than that obtained in the treatment of insecticide alone. These findings may due to the following reasons:

1. The spiny bollworm infest vegetable fields severely, so the rate of its activity and spreading in Alexandria Governorate is high.

2. The Rope- PBW pheromone was not specific for the spiny bollworm.
3. The areas treated with pheromone/insecticide were sprayed twice only, whereas the insecticide treated area was sprayed four times.

These results are in agreement with those obtained by Critchley et al. (1987) and Nackache et al. (1992).

2- Effect of Sex pheromone and/or insecticides on the population of predatory insects:

The results in Tables (3 and 4) show the influence of pheromone/insecticide alternatively and insecticide alone treatments on the inspected predators during the growing cotton seasons of 1999 and 2000. The data clearly elucidate that the populations of the predators in seasons of 1999 and 2000 were much high in pheromone/insecticide treatments as compared with the insecticide treatment. The highest percent values of totals inspected predators (22.39, 21.81, 21.05 in 1999 and 23.4, 22.51, 23.23% in 2000 on the cultivars Giza70, Giza88 and Giza89, respectively). These values were recorded in T₁ (Rop-PBW/ curacron / selibate / curacron) followed by T₃ then T₂. The lowest percent value was recorded in the insecticide treatment (13.19, 13.47 and 13.36 in 1999 and 11.29, 11.27 and 10.29) in season 2000 on Giza70, Giza88, and Giza89, respectively).

The weekly average of the individuals/20 plants in pheromone / insecticide plots prior spraying was firstly around 3-5 times more than that of insecticide- treated area in the two seasons.

The following are the prevailing predators in the inspected areas during the course of investigation.

a. Orius spp.

Table (6) shows that there were no significant differences between the cotton cultivars in seasonal mean numbers of total counted predators / 20 plants. The results in table (5) show that there are no significant difference between treatments in both seasons where the highest seasonal mean number was recorded in T₁ (PBW- Rope/curacron / selibate/ curacron in 1999 season) followed by T₂ and T₃, whereas the lowest mean number (3.09) was recorded in T₄ (insecticide alone). In 2000 season the highest mean number of *orius* Spp. (4.83) was recorded in T₁ followed by T₃ and T₂, respectively. On the other hand the mean number in the untreated check is 5.86.

b. Scymnus Spp

Table (6) Shows no significant difference between varieties while table (5) shows a high significant difference between treatments, where the highest seasonal mean numbers of total *scymnus spp.* /20 plants, were (5.17 & 4.71) individuals /20 plants in T₁ at 1999 and 2000 seasons respectively. The lowest count however, T₅ (untreated check) gave 5.86 and 5.46 during the growing seasons of 1999 and 2000, respectively

Table (3): Total number of predators/ 20 plants weekly counted in the different regimes program on the three varieties throughout the growing seasons of 1999

Varieties	Giza70					Giza 88					Giza79					Total Of totals
	T ₁	T ₂	T ₃	T ₄	T ₅	T ₁	T ₂	T ₃	T ₄	T ₅	T ₁	T ₂	T ₃	T ₄	T ₅	
*1No	20	16	17	20	22	18	19	17	23	19	18	19	21	18	19	21
**12-6	30	25	23	29	30	26	24	26	31	34	30	23	28	28	31	140
	31	29	29	40	38	39	32	35	41	36	31	25	39	35	38	168
	44	39	32	47	45	47	43	46	47	42	42	35	40	44	45	206
	48	45	44	50	51	55	47	47	50	57	49	46	45	50	45	235
	46	46	48	6	55	48	50	47	11	48	44	46	52	12	49	203
	48	40	52	10	49	52	47	51	13	42	52	44	51	12	52	211
	45	11	12	16	51	47	7	13	14	41	35	11	13	16	47	122
	14	12	14	4	44	10	10	13	6	43	82	12	16	6	42	88
	18	20	22	7	38	11	15	19	7	41	93	12	18	21	8	33
	22	25	27	2	31	20	19	21	5	40	105	19	23	22	2	33
	27	27	28	7	26	24	22	22	10	39	117	24	23	23	9	37
	31	6	7	14	23	81	24	5	2	39	75	24	4	5	10	32
	7	7	9	2	25	50	8	6	7	5	62	3	6	5	2	24
Total of totals	431	348	364	254	528	429	346	369	265	557	398	334	379	253	529	1893
	22.39	18.08	18.91	13.19	27.43	21.81	17.59	18.76	13.47	28.32	21.05	17.64	20.02	13.36	27.9	
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%

T₁= PB-Rop/ curacron/selibate/curacron. *1.No.= inspection number

** 12-6 = starting date of inspection

T₂= Selibate / curacron / last flight / curacron

T₃= Curacron

T₄= Untreated check

T₂= Last flight/ curacron/selibate /curacron

Table (4): Total number of predators/ 20 plants weekly counted in the different regimes program on the three varieties throughout the growing seasons of 2000

varieties	Giza70						Giza 88						Giza79						Total Of Totals
	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	
**13-6	23	19	18	23	24	107	28	25	22	18	27	120	21	20	20	19	28	108	
1 st	29	29	25	32	27	142	30	27	27	27	32	143	30	26	25	28	33	142	
2 nd	35	28	31	38	34	166	36	35	35	42	44	192	35	32	31	42	32	172	
3 rd	36	37	38	40	39	190	36	38	41	51	39	207	33	34	33	32	42	174	
4 th	44	31	43	8	39	165	44	36	46	13	46	185	40	34	43	8	47	172	
5 th	39	38	47	9	32	165	47	39	45	12	44	187	42	46	47	9	44	188	
6 th	47	47	47	14	35	190	44	50	45	11	42	192	45	37	47	13	46	188	
7 th	40	11	12	3	44	110	45	12	9	4	44	119	44	13	12	5	41	115	
8 th	41	13	12	6	36	108	38	16	13	6	37	110	37	12	15	8	43	115	
9 th	11	17	17	12	35	92	14	13	12	4	42	85	12	17	17	4	39	89	
10 th	19	21	22	3	45	110	16	11	15	6	37	85	15	18	23	5	27	88	
11 th	24	29	24	9	41	127	14	11	12	3	40	80	22	6	9	6	43	86	
12 th	28	18	4	2	38	80	11	3	5	6	42	67	27	8	8	4	34	81	
13 th	9	7	6	6	36	64	4	4	2	2	34	46	10	8	8	0	34	60	
14 th	425	335	346	205	505	1816	4.9	320	329	205	555	1818	413	311	338	183	533	1778	
Total	23.4	18.45	19.05	11.29	27.8		22.51	17.6	18.1	11.27	30.53		23.23	17.49	19.01	10.29	30		
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%

T₁= PB-Rop/ curacron/seilbate/curacron. T₂= Last flight/ curacron/seilbate /curacron
 ** 13-6 = starting date of inspection T₃= Seilbate / curacron / last flight / curacron T₄= Curacron T₅= Untreated check
 *1.No.= inspection number

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c. *Coccinella Spp.*

There was no significant difference between cotton varieties in 1999 and low significant difference in 2000 Season, where Giza88 showed the highest mean number followed by Giza70 (table 6).

Table (5) shows significant difference between treatments. It is noticed that T₁ (PB-Rope/ curacron/ selibate/curacron) had the highest effect in comparison with T₂ and T₃.

The curacron treatment (T₄) had the lowest seasonal mean number in both seasons 1999&2000.

d. *Chrysopa spp.*

Results in table (6) shows that there was no significant difference between varieties in 1999 season , while the mean numbers were significantly low between varieties in 2000 season, where Giza88 had the highest mean number; 5.36 individual 20 plants, followed by Giza89 (5.24) comparing with Giza70 (4.97). The seasonal mean numbers of counted *chrysopa spp.*/ 20 plants were significantly differed between treatments. T₁ and T₃ were comparable to T₂ and all treatments were comparable to T₄ insecticide alone in 1999, whereas T₁ was comparable to all treatments In addition, the lowest mean number was recorded in T₄ (insecticide alone) and all treatments were comparable to T₄ season 2000.

e. *Paedrus affireil*

There was no significant difference between the three varieties in both 1999 and 2000 seasons. All the treatments were comparable to (T₄) insecticide alone which had the lowest seasonal mean numbers in both seasons of 1999 and 2000 and the highest were in T₁ which was comparable to T₂ and T₃ in season 2000 only , (table 5)

f. *True spiders.*

Data in Table (6) revealed that there was low significant difference between the seasonal mean numbers of spiders / 20 plants during 1999 as Giza88 slightly exceeded the other two varieties . Mean while, there was no significant difference between varieties during season 2000. The seasonal mean number of total counted spiders/ 20 plants differed significantly between treatments in 1999 and 2000, where T₁ (PB- Rope / Curacron / selibate/ curacron) was comparable to the other treatments followed by T₃ and T₂, while T₄ (only insecticide) had the lowest seasonal mean number, (Table 5) .

From the above mentioned results it could be concluded that T₁ (PB-Rope / curacron / selibate / curacron) was superior to the other treatments and was approximately equal to untreated check in affecting the predators.

On the other hand during the whole period of investigation , T₁ and T₃ achieved better results and proved to be soft on predators than T₂. In addition all gossypure/ insecticide treatments proved to be better than T₄ pesticide (curacron) treatment.

Similar results were obtained by Gaston, *et al* (1977), Critchley *et al*, (1985), El-Adi, *et al.* (1986), El- Heneidy, *et al.* (1986), Moawad, *et al.* (1992), Al- Beltagy(1994), Abdel- Meguid *et al.* (1999) and Abdel- Rahman, (1999).

Table (5): Seasonal mean numbers of total counted predators/20 Plants in pheromone/ insecticide (T1, T2 and T3), only insecticide (T4) and untreated check (T5) during the growing season of 1999 and 2000

Treatments	Mean numbers of predators/20 plants						mean
	Orius	Scymnus	Coccinella	True spiders	Chrysopa	Peadrus	
T1	5.17c	5.17c	3.81c	6.81c	6.52c	2.50b	5.00
T2	4.30b	3.64b	3.19b	5.74b	5.38b	2.19b	4.07
T3	4.43b	3.43b	3.48c	6.07b	6.43c	2.58b	4.40
T4	3.09a	2.76a	2.18a	4.71a	4.09a	1.50a	3.05
T5	5.80a	5.86d	5.74d	8.90d	8.50d	3.62c	6.40
F	47.93***	82.61***	111.49***	117.02***	91.74***	39.83***	
L.S.D0.05	0.4039	0.3960	0.3400	0.4000	0.4700	0.3400	

2000

Treatments	Mean numbers of predators/20 plants						mean
	Orius	Scymnus	Coccinella	True spiders	Chrysopa	Peadrus	
T1	4.83c	4.71c	4.07c	6.71c	6.37c	2.93c	4.94
T2	4.19b	3.31b	3.20b	5.50b	4.51b	2.29b	3.83
T3	4.36b	3.48b	3.10b	5.81b	4.86b	2.48b	4.02
T4	2.50a	2.26a	1.83a	3.43a	2.69a	1.40a	2.35
T5	2.86d	5.46d	6.26d	8.50d	7.52d	4.38d	6.33
F	86.93***	83.27***	180.198***	192.44***	121.16**	89.27***	
L.S.D0.05	0.365	0.384	0.340	0.372	0.468	0.320	

Table (6): Seasonal mean numbers of total counted predators/20 Plants in the three cultivars of cotton G70 , G88 and giza89 throughout the growing season of 1999 and 2000

1999

pred Cult.	Orius	True spiders	Scymnus	Coccinella	Peadrus	Chrysopa	mean
	G70	4.69	6.343a	4.26	3.42	2.53	6.21
G88	4.71	6.743b	4.03	3.93	2.42	6.24	4.679
G89	4.29	6.257a	4.23	3.69	2.49	6.10	4.510
F	N.S	20.160*	N.S	N.S	N.S	N.S	N.S
L.S.D0.05		0.35					

2000

Pred Cult.	Orius	True spiders	Scymnus	Coccinella	Peadrus	Chrysopa	mean
	G70	4.50	6.10	3.79	3.714b	2.90	4.97a
G88	4.39	5.93	3.76	3.790b	2.73	5.36b	4.33
G89	4.16	5.94	3.99	3.585a	2.46	5.24b	4.33
F	N.S	N.S	N.S	37.750*	N.S	21.64*	
L.S.D0.05				0.100		0.26	

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التأثيرات الجانبية لبعض تجهيزات الفرمونات ومبيد السبروفينوفوس أو مبيد البروفينوفوس منفردا على بعض الحشرات الغير مستهدفه .

إبراهيم جلال محمد

معهد بحوث وقاية النباتات - مركز البحوث الزراعية

لقد أجريت التجارب الحقلية في مزرعة كلية الزراعة - سنيا باشا - جامعة الإسكندرية خلال موسمي ١٩٩٩، ٢٠٠٠ ، وذلك لتقييم التأثيرات الجانبية لثلاث تجهيزات من الفرمون (جوسيلور) بالتكامل تبادلياً مع رشتين من مبيد الكوراكرون على دودة اللوز الشوكية وكذلك على بعض المفترسات الشائعة في حقول القطن ومقارنتها بفاعلية استخدام المبيدات فقط (أربع رشات) . ولقد تم دراسة تأثير هذه المعاملات على ٣ أصناف من القطن المصري خلال موسمي ١٩٩٩، ٢٠٠٠ ، وهي جيزة ٧٠ ، جيزة ٨٨ ، جيزة ٨٩ ن ولقد أوضحت التجارب النتائج التالية :

(١) أظهرت النتائج أن استخدام المبيد فقط حقق مستوى جيد من الإصابة (٤,٠٣ ، ٤,٤٢ ، ١٠٠ / يرقة / لوزة) بالمقارنة مع استخدام الفرمونات والمبيد تبادلياً . حيث كان مستوى الإصابة (٤,١٦ ، ٥,١٥ ، ١٠٠ / لوزة) في المعاملة الأولى . (٥,٣٣ ، ٦,٠٦ / يرقة / ١٠٠ لوزة) في المعاملة الثانية (٥,٣٩ ، ٥,٢٥ / يرقة / ١٠٠ لوزة) في المعاملة الثالثة خلال موسمي ١٩٩٩، ٢٠٠٠ على الترتيب .

(٢) ولقد تأكدت هذه النتائج بإظهار الاختلافات المعنوية بين المتوسطات الموسمية لمعاملات الفرمونات مع المبيد ومعاملة المبيد منفرد ومن جهة أخرى لم تكن هناك أية فروق معنوية بين متوسطات الإصابة بديدان اللوز الشوكية بين الأصناف الثلاثة.

(٣) أظهر الفحص الدوري الذي أجري على مدى ١٤ أسبوع خلال موسمي ١٩٩٩، ٢٠٠٠ أن الكثافة العددية لأنواع المفترسات المختلفة في المساحات المعاملة بالفرمون مع المبيد بالتبادل بلغت حوالي ٣-٧ أمثال الكثافة العددية لهذه المفترسات في المساحة المعاملة بالمبيد فقط خلال فترة التطبيق . حيث كانت أعلى نسبة مئوية لمجموع المفترسات بالنسبة لتعدادها الكلي في معاملة السبي سبي روب - كوراكرون - سليبت - كوراكرون - أي المعاملة الأولى ٢٢,٣٩ ، ٢١,١٨ ، ٢١,٢ % موسم ١٩٩٩، ٢٣,٢٣ ، ٢٢,٥١ ، ٢٣,٤ % موسم ٢٠٠٠ على أصناف القطن الثلاثة جيزة ٧٠ ، جيزة ٨٨ ، جيزة ٨٩ على الترتيب يليها في ذلك المعاملة الثالثة (سليبت - كوراكرون - لامست فلايت - كوراكرون) (١٨,٩١ ، ١٨,٧٦ ، ٢٠,٠٢ % موسم ١٩٩٩ ، ١٩,٠١ ، ١٨,١ ، ١٩,٠٥ % موسم ٢٠٠٠ على الأصناف جيزة ٧٠ ، جيزة ٨٨ ، جيزة ٨٩ على الترتيب وذلك مقارنة مع أقل نسبة مئوية لمجموع المفترسات بالنسبة لتعدادها الكلي وهي ١٣,١٩ ، ١٣,٤٧ ، ١٣,٣٦ % في موسم ١٩٩٩ ، ١٠,٠٩ ، ١١,٢٧ ، ١١,٢٩ في موسم ٢٠٠٠ على أصناف القطن جيزة ٧٠ ، جيزة ٨٨ ، جيزة ٨٩ على الترتيب في معاملة المبيد منفرد .

(٤) كانت أنواع العناكب الحقيقية *True spiders* . وأسد المن *Chrysopa spp* أكثر أنواع المفترسات شيوعاً في حقول القطن يليها جندي البق *Orius spp* وكانت أكثر الأنواع حساسية لتطبيق المبيد هي مفترسات الرواغسمة *Peadrus spp* وأبو العيد *Coccinella spp* والأسكنس *Scymnus spp*