

POPULATION DENSITY AND ACTIVITY OF THE WHITEFLY, *Bemisia tabaci* (GENNADIUS) IN COTTON FIELDS

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ABSTRACT

Population abundance of the whitefly, *Bemisia tabaci* Gennadius in cotton plants was studied during 2000 and 2001 cotton seasons. The experiment was carried out at Tookh district, Kalubia Governorate, from July to early of November. The appearance of *B.tabaci* (Genn.) insect continued about 15-16 weeks from the beginning of Sowing.

Results indicated that the population density of this pest represented by four distinct peaks during the season of activity. The immature stages of *B.tabaci* (Genn.) occurred in high numbers on cotton leaves during the growing period and also there are 4 peaks of population were noticed. An assessment of occurrence and abundance of annual broods was approximated.

Concerning mid to late season; the population of whitefly adults showed a fluctuation of four peaks on July, August, September and October representing by 368.75, 1000, 762 and 1977.5 individuals / 100 cotton leaves, respectively and 371.5, 1013, 873.5 and 2004 adults/100 cotton leaves, respectively during 2000 and 2001 cotton seasons, respectively. For nymphs, four peaks were also observed on July, August, September and October representing by 336.5, 84, 93.5 and 63.75 individuals /100 cotton leaves, respectively and 404.5, 168, 80 and 72.25 nymphs /100 cotton leaves, respectively during 2000 and 2001 cotton seasons, respectively.

INTRODUCTION

Cotton is considered as the main cash crop in Egypt. In addition, the whitefly *B. tabaci* (Genn.) causes a great part of yield losses resulted from approximately one million feddan cultivated annually. However, it became necessary to recommend certain measure for the control of it at early, mid and late season because of its serious.

For the economic importance of *B.tabaci*, many authors studied the changes in the population dynamics and number of field generations of this insect pest (Azab *et al.*1972; Melamed-Madjar *et al.*1979; Gerling *et al.*1980; Xu Rumei,1982; Gerling and Horowitz,1984; Von Arx *et al.*1984; Horowitz,1985; Baumgartner *et al.*1986; Ougur and Sekeroghn,1989; Watson *et al.*1992; Nadihalli *et al.*1993 and Romeila *et al.* 2000). In Egypt, during the last few years the population of this insect pest increased gradually and it invaded the cultivated cotton fields.

In some years the attack was so several that honeydew had spread all over the infested cotton leaves and led to the formation of the black sooty mold. This may be due to the use of pesticide which badly affected the natural balance of the pest. It damages the leaves by disapping them and inject its saliva therein, which consequently get disfigured, discoloured and inflicted on cotton crop (Husain and Trehan, 1936 and Ibrahim and Abo El-Dahab,1960).

Because maintaining cotton health is essential and also for profitable cotton production, several attempts regimes were evaluated. Therefore, it is of interesting to shed additional light on whitefly insect attacking cotton fields at Kalubia Governorate and to limit the economic threshold level for infestation of this pest, so, chemical control program can be used.

MATERIALS AND METHODS

An field experiment was carried out at Tookh district, Kalubia Governorate for two successive cotton seasons of 2000 and 2001 to study the seasonal changes in the abundance of the sucking insect pest, *Bemisia tabaci* (Genn.). One area of two feddans was divided into 4 plots of 0.5 feddan each. The field was cultivated with cotton variety Giza 86 on late March during 2000 and 2001 cotton seasons. The normal agricultural practices were followed. When the plants were 15 weeks old in beginning of July, samples were collected at random from both diagonals of the inner square area of each experimental plot until harvest. The species of cotton whitefly, *B. tabaci* were taken into account.

For counting the mid and late season whiteflies population, 25 cotton leaves were sampled at weekly intervals from each plot early in the morning from different levels of the plant (upper, middle and lower level, respectively). The upper and lower surfaces of the leaf were examined carefully (Hassanein *et al.*1971). The count included both adults and nymphs, using manual magnifying lens in the field for adult individuals, while for the immature stages (nymphs), bionocular microscope was used in the laboratory, according to the method adopted by (Mohamed, 1977). Any insecticides application not be done throughout the whole season against the sucking insects especially the whiteflies.

Statistical analysis of the data:

The absolute figures of the pest were transformed by using $(X + 1)$ (Standard deviation) to have a normal distribution of the populations.

RESULTS AND DISCUSSION

As shown in Table (1) The weekly number of *B.tabaci* adults reveals the fluctuation in the population density of this insect from July to early November during both 2000 and 2001 cotton seasons. Data illustrated in the table indicated that the population density of this insect is supposed to follow more or less three distinct annual broods of activity periods; the first brood extends from early July to the second week of August during 2000 and 2001 cotton seasons ; the second brood harbored and continued up to the last week of September while the third one lasted to early November. It is clear that infestation mean level during the first period of activity fluctuated between 2.75 in the beginning of July to 1000 individuals / 100 cotton leaves (first peak) at the first half of August during 2000 cotton season, while it was fluctuated between 4.25 and 1013 individuals / 100 cotton leaves during the same period (early July and second week of August) in 2001 cotton season.

Through the time of the first period of activity during 2000 cotton season; it was observed that the level of infestation increased gradually

reached to 368.5 individuals/100 cotton leaves at the end of July and decreased suddenly at August to (8-26) individuals/100 cotton leaves and continued to reach its maximum level of 1000 individuals/100 cotton leaves (first peak) at the second week of August. In 2001 cotton season, the infestation level during the first period of activity started by 4.25 individuals/100 cotton leaves and reached its maximum at August 12 (first peak). The second period of the fly's activity during 2000 cotton season became from the third week of August up to the last week of September. At the beginning of this period (August 14), the infestation level started by 410 individuals /100 cotton leaves. After one week only (August 21) it dropped suddenly to 105 individuals/100 cotton leaves, then to 66 at the first week of September and increased again to 177.25 at September 11, then decreased to 34.25 after one week ; September 25, the level of infestation was going to increased and reached 762 individuals/100 cotton leaves formed the second peak. For 2001 cotton season, the infestation level during the second period of the fly's activity fluctuated between 415 individuals/100 cotton leaves at the third week of August and 873.5 (second peak) at September 23. The third period of adults activity during 2000 cotton season started by 31.25 individuals/100 cotton leaves at early October. The infestation level fluctuated during this period (16 and 281.5 respectively) till it reached to the maximum level of infestation (1977.5 individuals/100 cotton leaves) formed its highest peak (third peak) at October 23. The number of adults insect decreased suddenly to 81 and 65 individuals/100 cotton leaves respectively, at the end of cotton season; November 6. The infestation level during the third period of activity in 2001 cotton season started by 37.25 individuals/100 cotton leaves at late September, then fluctuated (37.25, 16 and 315 individuals/100 cotton leaves) till reached the third peak of 2004 individuals/100 cotton leaves (highest peak) at the third week of October, then it decreased to 99.75 and 65.75 respectively. Individuals /100 cotton leaves at late season; early November.

Table 2 demonstrated that the white fly activity of nymphs throughout the periods extended from the first week of July to the end of October and early November and the nymphs population have three periods of activity throughout the season of infestation. During 2000 cotton season, the first period began at early July by 7.5 nymphs /100 cotton leaves, then fluctuated (4.25, 50.75 and 159.5 nymphs /100 cotton leaves respectively) to reach 336.5 nymphs/100 cotton leaves (first peak) at late July (the first period of activity). The second activity period extended from August 7 by 62 nymphs /100 cotton leaves to 84, 60.75, 13.25 and 93.5 nymphs /100 cotton leaves respectively, representing the second peak. The third period of nymphs activity extended from September 18 and started by 30 individuals/100 cotton leaves and continued up to October 9 to reach the third peak (63.75 nymphs /100 cotton leaves). For 2001 cotton season, the first period nymphs activity lasted from early July; 2 nymphs /100 cotton leaves to reach 404.5 nymphs (first peak) at late July.

Table 1: Seasonal abundance of *Bemisia tabaci* adults weekly during cotton growing seasons of 2000 and 2001 at Kalubia Governorate.

Cotton growing season of 2000								
Weekly sampling dates	Plant age/ week	Number of adults / 100 leaves				Total	Mean	Standard deviation
		Replicates						
		a	b	c	d			
3/7/2000	13	4	1	3	3	11	2.75	- 303.237
10/7	14	17	28	8	15	68	17	- 288.987
17/7	15	96	112	99	81	388	97	82.013
24/7	16	265	216	311	246	1038	259.5	- 46.487
31/7	17	277	399	388	411	1475	368.75	16.276
7/8	18	47	68	55	78	248	62	- 243.987
14/8	19	909	855	995	1241	4000	1000	694.013
21/8	20	418	258	524	440	1640	410	104.013
28/8	21	96	58	112	154	420	105	- 200.987
4/9	22	58	95	69	42	264	66	- 239.987
11/9	23	146	201	158	204	709	177.25	- 128.737
18/9	24	45	25	14	53	137	34.25	- 271.737
25/9	25	815	533	786	914	3048	762	456.013
2/10	26	29	33	41	22	125	31.25	- 274.737
9/10	27	11	14	25	14	64	16	- 289.987
16/10	28	391	288	258	189	1126	281.5	- 24.487
23/10	29	1825	1414	2581	2090	7910	1977.5	1671.513
30/10	30	71	69	88	96	324	81	- 224.987
6/11	31	85	48	69	58	260	65	- 240.987
Total						23255	5813.75	
Mean						1223.947	305.987	
Cotton growing season of 2001								
1/7/2001	13	5	2	6	4	17	4.25	- 310.237
8/7	14	21	31	33	11	96	24	- 290.487
15/7	15	71	92	110	97	370	92.5	- 221.987
22/7	16	206	199	217	181	803	200.75	- 113.737
29/7	17	281	399	381	425	1486	371.5	57.013
5/8	18	57	40	51	33	181	45.25	- 269.237
12/8	19	1001	861	990	1200	4052	1013	698.513
19/8	20	518	302	507	333	1660	415	100.513
26/8	21	114	75	99	145	433	108.25	- 206.237
2/9	22	47	88	51	55	241	60.25	- 254.237
9/9	23	247	201	161	211	820	205	- 109.487
16/9	24	33	25	25	14	97	24.25	- 290.237
23/9	25	1006	698	786	1004	3494	873.5	559.013
30/9	26	33	33	56	27	149	37.25	- 277.237
7/10	27	13	14	22	15	64	16	- 298.487
14/10	28	415	366	257	222	1260	315	0.513
21/10	29	2002	1404	2599	2011	8016	2004	1689.513
28/10	30	88	102	88	121	399	99.75	- 214.737
4/11	31	77	49	71	66	263	65.75	- 248.737
Total						23901	5975.25	
Mean						1257.947	314.487	

Table 2: Seasonal abundance of *Bemisia tabaci* nymphs weekly during cotton growing season of 2000 and 2001 at Kalubia Governorate.

Cotton growing season of 2000								
Weekly sampling dates	Plant age/ week	Number of nymphs / 100 leaf				Total	Mean	Standard deviation
		Replicates						
		a	b	c	d			
3/7/2000	13	8	1	16	5	30	7.5	- 50.57
10/7	14	3	4	6	4	17	4.25	- 53.82
17/7	15	46	50	60	47	203	50.75	- 7.32
24/7	16	161	202	186	89	638	159.5	101.43
31/7	17	372	501	166	307	1346	336.5	278.43
7/8	18	40	71	81	56	248	62	3.93
14/8	19	57	89	114	76	336	84	25.93
21/8	20	45	66	80	52	243	60.75	2.68
28/8	21	8	11	11	23	53	13.25	- 44.82
4/9	22	33	55	32	20	140	35	- 23.07
11/9	23	86	96	90	102	374	93.5	35.43
18/9	24	11	41	32	36	120	30	- 28.07
25/9	25	7	18	11	10	46	11.5	- 46.57
2/10	26	13	6	5	0	24	6	- 52.07
9/10	27	71	69	53	62	255	63.75	5.68
16/10	28	6	11	21	8	46	11.5	- 46.57
23/10	29	11	19	26	24	80	20	- 38.07
30/10	30	37	46	60	32	175	43.75	- 14.32
6/11	31	5	11	9	14	39	9.75	- 48.32
Total						4413	1103.25	
Mean						232.263	58.066	
Cotton growing season of 2001								
1/7/2001	13	6	0	2	0	8	2	- 67.83
8/7	14	10	14	13	8	45	11.25	- 58.58
15/7	15	25	30	29	32	116	29	- 40.83
22/7	16	222	181	214	188	805	201.25	131.42
29/7	17	406	522	303	387	1618	404.5	334.67
5/8	18	101	206	181	92	580	145	75.17
12/8	19	190	282	160	40	672	168	98.17
19/8	20	31	26	38	15	110	27.5	- 42.33
26/8	21	11	11	8	2	32	8	- 61.83
2/9	22	47	33	29	18	127	31.75	- 38.08
9/9	23	21	97	102	100	320	80	10.17
16/9	24	15	30	22	14	81	20.25	- 49.58
23/9	25	6	8	6	2	22	5.5	- 64.33
30/9	26	20	14	18	21	73	18.25	- 51.58
7/10	27	37	40	42	38	157	39.25	- 30.58
14/10	28	56	81	90	62	289	72.25	2.42
21/10	29	10	6	5	12	33	8.25	- 61.58
28/10	30	47	58	36	52	193	48.25	- 21.58
4/11/1999	31	8	2	7	9	26	6.5	- 4.83
Total						5307	1326.75	
Mean						279.316	69.829	

Table 3: Mean and accumulated number of *Bemisia tabaci* adults at Kalubia Governorate during 2000 and 2001 cotton seasons.

Cotton growing season of 2000					
No.	Date of inspection	Days accumulated	Mean No. of insect / inspection	No. of accumulated insects	% Accumulated insects for total
1	3/7/2000	7	2.75	2.75	0.05
2	10/7	14	17	19.75	0.34
3	17/7	21	97	116.75	2.01
4	24/7	28	259.5	376.25	6.48
5	31/7	35	368.75	739	12.72
6	7/8	42	62	801	13.79
7	14/8	49	1000	1801	31.01
8	21/8	56	410	2211	38.07
9	28/8	63	105	2316	39.88
10	4/9	70	66	2382	41.01
11	11/9	77	177.25	2559.25	44.07
12	18/9	84	34.25	2593.5	44.66
13	25/9	91	762	3355.5	57.78
14	2/10	98	31.25	3386.75	58.31
15	9/10	105	16	3402.75	58.59
16	16/10	112	281.5	3684.25	63.44
17	23/10	119	1977.5	5661.75	97.49
18	30/10	126	81	5742.75	98.88
19	6/11	133	65	5807.75	100
Cotton growing season of 2001					
1	1/7/2001	7	4.25	4.25	0.07
2	8/7	14	24	28.25	0.47
3	15/7	21	92.5	120.75	2.02
4	22/7	28	200.75	321.5	5.38
5	29/7	35	371.5	693	11.6
6	5/8	42	45.25	738.25	12.36
7	12/8	49	1013	1751.25	29.31
8	19/8	56	415	2166.25	36.25
9	26/8	63	108.25	2274.5	38.07
10	2/9	70	60.25	2334.75	39.07
11	9/9	77	205	2539.75	42.5
12	16/9	84	24.25	2564	42.91
13	23/9	91	873.5	3437.5	57.53
14	30/9	98	37.25	3474.75	58.15
15	7/10	105	16	3490.75	58.42
16	14/10	112	315	3805.75	63.69
17	21/10	119	2004	5809.75	97.23
18	28/10	126	99.75	5909.5	98.9
19	4/11/1999	133	65.75	5975.25	100

The second activity period started by 145 nymphs /100 cotton leaves at the first week of August and fluctuated (168, 27.5, 8 and 31.75 nymphs /100 cotton leaves respectively) to reach 80 individuals/100 cotton leaves (second peak). The third peak of nymphs activity was going between

September, 16 and the second week of October, by 20.25 and 72.25 nymphs /100 cotton leaves, respectively.

Table (3 and 4) showed the mean and accumulated number of *B.tabaci* adults and nymphs, respectively on cotton plants during the whole periods of activity. Data recorded before indicated that the whitefly population density fluctuated greatly during July, August, September and October

Table 4: Mean and accumulated number of *Bemisia tabaci* nymphs at Kalubia Governorate during 2000 and 2001 cotton seasons.

Cotton growing season of 2000					
No.	Date of inspection	Days accumulated	Mean No.of insect / inspection	No.of accumulated insects	%Accumulat ed insects for total
1	3/7/2000	7	7.5	7.5	0.7
2	10/7	14	4.25	11.75	1.09
3	17/7	21	50.75	62.5	5.81
4	24/7	28	159.5	222	20.64
5	31/7	35	336.5	558.5	51.92
6	7/8	42	62	620.5	57.68
7	14/8	49	84	704.5	65.49
8	21/8	56	60.75	764.75	71.09
9	28/8	63	13.25	778	72.32
10	4/9	70	35	813	75.58
11	11/9	77	93.5	906.5	84.27
12	18/9	84	30	936.5	87.06
13	25/9	91	11.5	948	88.12
14	2/10	98	6	954	88.68
15	9/10	105	36.75	990.75	92.1
16	16/10	112	11.5	1002.25	93.17
17	23/10	119	20	1022.25	95.03
18	30/10	126	43.75	1066	99.09
19	6/11	133	9.75	1075.75	100
Cotton growing season of 2001					
1	1/7/2001	7	2	2	0.15
2	8/7	14	11.25	13.25	0.97
3	15/7	21	29	42.25	3.08
4	22/7	28	201.25	243.5	17.74
5	29/7	35	404.5	648	47.22
6	5/8	42	145	793	57.79
7	12/8	49	168	961	70.03
8	19/8	56	27.5	988.5	72.03
9	26/8	63	8	996.5	72.62
10	2/9	70	31.75	1028.25	74.93
11	9/9	77	80	1108.25	80.76
12	16/9	84	20.25	1128.5	82.24
13	23/9	91	5.5	1183.5	86.25
14	30/9	98	18.25	1201.75	87.58
15	7/10	105	39.25	1237	90.14
16	14/10	112	72.25	1309.25	95.41
17	21/10	119	8.25	1317.5	96.01
18	28/10	126	48.25	1365.75	99.53
19	4/11/1999	133	6.5	1372.25	100

This fluctuation may be due to the changes in the weather factors happen yearly during the cotton growing season. So we must put in mind this pest has a very high and swift reproduction for one season or another. Yet it

must be recommended to treat any degree of infestation by this pest as if was small, to avoid the sudden out break, this is for adults or nymphs. The same trend can be followed.

The fluctuation of whitefly population:

The mean number of whitefly adults show that, there are three periods of activity occurred from the first week of July to early November. At the same time three periods of activity for the nymphs stages were also occurred from early July to mid October. These results could be summarized as follows:

(a) – Whitefly adults:

The first period of activity:

This period continued from the beginning of July to the second week of August during both 2000 and 2001 cotton seasons, it considered the principal period of activity because of the high numbers of the insect appearance coincided with the highest flowering and fruiting stage of the plants. It contained two peaks for activity (368.5 and 1000 individuals / 100 leaves for 2000 cotton season and 200.75 and 1013 individuals/ 100 leaves for 2001 cotton season).

The second period of activity:

The peak of this period appeared around the second half of August till the second half of September. It considered of lower density than the first period, containing one peak for both 2000 and 2001 cotton seasons, these were; 762 and 873.5 individuals /100 cotton leaves for the first and second season, respectively.

The third period of activity:

It covered a period of about six weeks from the second half of September till early November, and the population size was considerably high. This period had one peak of activity and existed with the full growing plants and completely maturity. This peak was represented by 1977.5 and 2004 individuals /100 cotton leaves at the last week of October in 2000 and 2001 cotton seasons respectively.

(b) – Whitefly nymphs :

It could be also divided to three periods as follows:

The first period of activity:

It extended from the beginning to late July during the two seasons under study; its high peaks were found in the fourth week of July. This period included one peak of activity for both two seasons under study, represented by 336.5 and 404.5 individuals /100 cotton leaves for 2000 and 2001 cotton season, respectively.

The second period of activity:

It covered a period from the first week of August till the second week of September and included two peaks during 2000 and 2001 cotton

seasons. At the same time, these peaks were smaller than that of the first period because of plant maturity, hence, the infestation became low. These peaks were represented by 84 & 9305 and 168 & 80 individuals /100 cotton leaves for 2000 and 2001 cotton seasons, respectively.

The third period of activity:

This period lasted from mid September to the second week of October during both 2000 and 2001 cotton seasons, it considered the lowest period of activity because of the low numbers of the insect appearance coincided with the late season. It contained one peak of activity for both seasons (63.75 and 72.25 individuals / 100 cotton leaves for 2000 and 2001 cotton seasons, respectively).

***Bemisia tabaci* generations:**

a- Approximated number of *Bemisia tabaci* Adult generations:

The obtained data indicated that this insect has four overlapping generations on cotton plants throughout the whole season of insect activity which extended from the beginning of July to the end of October (Table 5), as follows:

The first generation:

As shown in Table (5), The first appearance of this generation took place around the second week of July, thus extended approximately one month for both 2000 and 2001 cotton seasons. On the other hand, it considered as a strong generations because of its existence coincided with the period of plant flowering and fruiting stage.

The second generation:

The duration of this generation lasted for 4 – 5 weeks from the end of July and early August to late August and second week of September for 2000 and 2001 cotton seasons, respectively. It considered also as a strong generation, hence, it was an important economic generation together with the first one because they represented the serious period of adult population activity.

The third generation:

The adults of this generation occurred at late August of 2000 and early September of 2001 cotton seasons and lasted for one month, hence, the fluctuation in the population density was very clear here, and it may be attributed to one or more of the unsuitable bio or physical factors.

The fourth generation:

The individuals of this generation started to appear at late September and early October of 2000 and 2001 cotton seasons, respectively and continued to occur on the cotton plants until late October during the two seasons under study. The duration of this generation was 3 – 4 weeks. The persistence of this generation was close up with the plant complete maturity, consequently, its economic harmful was very slight.

b- Approximated number of *Bemisia tabaci* nymph generations

Table (6) determined the approximated number and duration of *Bemisia tabaci* nymph generations

The first generation:

The duration of this generation extended for one month, started from the first week of July to the first one of August. It considered one of the important economic generations because the cotton plants, in that time were in its high activity for flowering and fruiting stages.

The second generation:

The nymphs of this generation took place, and continued to emerge for 3 and 4 weeks during 2000 and 2001 cotton seasons, respectively. It considered one of the serious economic generations because its appearance was simultaneous with the high activity of cotton plants.

The third generation:

The individuals of this generation were first observed on the cotton plants from late August and continued to late September during the two cotton seasons of 2000 and 2001. The duration of this generation lasted about one month.

The fourth generation:

The nymphs of this generation fluctuated in its population density, between increasing and decreasing as a result of one or more of bio or physical factors. The duration of this generation continued about one month, started from late September to late October.

Finally, the results obtained, during the whole period of insect activity for 2000 and 2001 cotton growing seasons emphasized that there was a strong clearly applicable between the peak of the first generation for both adults and nymphs stages. It could be also referred that, there was a similar time for the existence between adults and nymphs for the third and fourth generation of 2000 cotton season, but there were highly differentiation between them for the population density whenever it was low owing to the nymphal stage.

This phenomenon may be due to the mortality factors at this period for the nymphs than adults. Adding, the existence of the whitefly nymphs was one week before whitefly adults. This may be probably attributed to the variability in adult reproductive activity being positively correlated with temperature (El - Serwiy *et al.*, 1984). It seems that faster insect development occurred at optimum temperature and relative humidity (approximately 30 °C and 65 – 70% R.H.) (Powel and Bellows, 1992 a).

Table 5: Period of adults occurrence and number of *Bemisia tabaci* generations at Kalubia Governorate during 2000 and 2001 cotton growing seasons.

Cotton growing season of 2000			
Generation number	Date of nymphs occurrence		Generation period /week
1 st	2 nd week of July	2 nd week of August	4
2 nd	4 th week of July	4 th week of August	4
3 rd	4 th week of August	4 th week of September	4
4 th	4 th week of September	4 th week of October	4
Cotton growing season of 2000			
1 st	2 nd week of July	2 nd week of August	4
2 nd	1 st week of August	2 nd week of September	5
3 rd	1 st week of September	1 st week of October	4
4 th	1 st week of October	4 th week of October	3

Table 6: Period of nymphs occurrence and number of *Bemisia tabaci* generations at Kalubia Governorate during 2000 and 2001 cotton growing seasons.

Cotton growing season of 2000			
Generation number	Date of nymphs occurrence		Generation period /week
1 st	1 st week of July	1 st week of August	4
2 nd	1 st week of August	4 th week of August	3
3 rd	4 th week of August	4 th week of September	4
4 th	4 th week of September	4 th week of October	4
Cotton growing season of 2001			
1 st	1 st week of July	1 st week of August	4
2 nd	1 st week of August	1 st week of September	4
3 rd	4 th week of August	4 th week of September	4
4 th	4 th week of September	4 th week of October	4

High and low temperatures and relative humidity exerted their action in suppressing *B. tabaci* populations (Powel and Bellows, 1992 a). A strong correlation was found between the whitefly populations and both temperature and relative humidity during the experimental season. Similar findings were reported by Bhardwaj and Kushwaha, 1984 in Rajasthan and Nadihalli *et al.* 1993 in India.

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نشاط مجاميع الذبابة البيضاء في حقول القطن

كامل حسن الليثي

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

درست كثافة ونشاط مجاميع الذبابة البيضاء في حقول القطن خلال موسمي سنة ٢٠٠٠ و سنة ٢٠٠١ بمركز طوخ محافظة القليوبية وقد اتضح من النتائج أن مجاميع هذه الحشرة تبدأ في الظهور بحقول القطن بعد موعد الزراعة بحوالي ١٥ - ١٦ أسبوع . كما بينت النتائج أن لمجاميع هذه الحشرة ٤ قمم من النشاط خلال موسم النمو . تظهر الاطوار الكاملة لهذه الحشرة على أوراق نباتات القطن خلال فترة نموه، وقد وجد أن كثافة مجاميع هذه الحشرة تتغير خلال أشهر يوليو وأغسطس وسبتمبر وأكتوبر ، حيث تظهر خلال هذه الفترة قمم هذه الأعداد في الحشرات الكاملة ويمثلها ٣٦٨,٧٥ ، ١٠٠٠ ، ٧٦٢ ، ١٩٧٧ لكل ١٠٠ ورقة من النبات على التوالي في سنة ٢٠٠٠ بينما كانت تتمثل هذه القمم بالأعداد ٣٧١,٥ ، ١٠١٣ ، ٨٧٣,٥ ، ٢٠٠٤ حشرة لكل ١٠٠ ورقة من النبات على التوالي في سنة ٢٠٠١ . وكانت الأعداد التي تمثل قمم مجاميع الحوريات هي ٣٣٦,٥ ، ٨٤ ، ٩٣,٥ ، ٦٣,٧٥ حورية لكل ١٠٠ ورقة من النبات في سنة ٢٠٠٠ أما هذه القمم خلال سنة ٢٠٠١ فكانت تتمثل بالأعداد ٤٠٤,٥ ، ١٦٨ ، ٨٠ ، ٧٢,٢٥ حورية لكل ١٠٠ ورقة من النبات .