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SURVEY AND POPULATION DENSITY OF SESAME PESTS AND ASSOCIATED NATURAL ENEMIES

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ABSTRACT:

The present studies were carried out in farmer fields cultivated with sesame Sesamumindicum L variety Shandaweelduring 2021 and 2022 seasonsat Abo Hammad district, Sharkia Governorate, Egypt, to survey the pests, natural enemies associated with sesame plants and to study the population density of the main and dominant pests. The pests recorded relatively high mean numbers were leafhoppers species, two spotted spider mites,green peach aphids, onion thrips and green stink bugpests were recorded relatively high mean numbers followed by whiteflyand last species in very low numbers. In addition, four species of insect predators and one predatory mite was found associated with pests on sesame plants in very low numbers. The occurrence periods and population fluctuation of main pestsspecies i.e., Empoasca spp., Myzuspersicae, Nezaraviridula, Thripstabaci and Tetranychusurticae were investigated.

TheEmpoasca spp. infested sesame plants from June to end of September during the two seasons, with relatively highest peak of 49.5 individual/ leaf on 13th August during 2021. The occurrence periods of the green peach aphids, were extended from April to October recorded relatively highest peak of 43.25 individual/ leaf on 27th August during the 2022 season for the green stink bug it was infesting plants recording (7.75 and 8.25 individuals / leaf) on 16th and 23th Jul. during two seasons, respectively. In the same trend the Green stink bug and onion thrips infested sesame plants from June to September during the two seasons with relatively highest peaks of 8.25 individual/ plant and 22.25 individual/ leaf at 2022and 2021 seasons for the two insects, respectively. Also, the Twospotted spider mites T. urticae was occured sesame plants from June to September during the two season recorded relatively high peak of 37.5 individual/ leaf recorded at 2nd July during 2021. The effects of metrological factors on pests population were varied where the highest significant effect of 65.29 % was recorded as combined effect (E.V

%) of each of mean temperature and relative humidity on M. persicae, while the lowest effect of 1.7 % was recorded on Nezaraviridula during the 1st season.

***Conclusively,** it can be concluded that the leaf hopper (Empoasca spp.) infested sesame plants from June to end of September during the two seasons , also the green peach aphids, were extended from April to October.*
Key wards: Sesame plants, pests, natural enemies, survey, population density.

INTRODUCTION:

The sesame (*Sesamumindicum L.*, Fam:Pedaliaceae), was considered a one of important field crop in Egypt as well as worldwide. The sesame is one of the oldest and important oil seed crop. The sesame seed is a rich source of edible oil. Its oil content generally varies from 46to52% Along with unsaturated fatty acids and antioxidant lignans (Mahmoud, 2013; MoazzamiandKamal-Eldin 2006 and Cagirgan, *et al*., 2013). In Egypt, Sesame not used as oil seed crop only but used as seed directly, tahini and tahini sweet. The sesame cultivated area reach to 36907 ha in 2010 and its production reach to 48000 Ardab at 2021 (FAOSTAT 2021).

The sesame plants crops liable to be attacked by a number of serious pests such as piercing-sucking insect pests and plant mite (Biswas*et al*, 2001). Nymph and adults of some sucking insect pests, jassid (*Orosiusalbicinctus* Distant, mirid bug (*Nesidiocoristenuis* Rent.) and white fly (*Bemisiatabaci*Gennadius) Stink bug*Nezaraviridula* L., Mirid bug *Creontiades* sp., Green peach aphid *Myzuspersicae* (Sulzer) were infested sesame plants , Leafhopper *Empoascalybica* de Berg and Whitefly *Bemisiatabaci* (Gennadius)suck the cell sap from leaf, flower, and pods. This leads to curling of leaf margin downwards, stunted the growth of theplant and ultimately reduce the yield.Also jassid and white fly are also responsible to transmit phyllody and leaf curl diseases in sesame, respectively (Mishra *et al*., 2015).

Some of these pests are major pests cause serious damage to these plants, directly by sucking plants sap and indirectly by transmitting pathogen microorganisms (El-Gindy, 2002).Also, the climatic changes was affected the distribution of these pests. Also, there were many of natural enemies found associated with thepests on sesame plants Thangjamm andVastrad(2018).

Therefore, this studiesaimed to study the survey and population density of piercing-sucking pests infested sesame plants and its associated natural enemies.

MATERIALS AND METHODS

Therefore, the present studies were carried out in farmers' fields cultivated with sesame variety Shandaweel at 15 and 21 May during the two

seasons of 2021 and 2022, respectively at Abo Hammad district, Sharkia Governorate, Egypt.

Experiments design:

The investigated sesame fields were selected randomly in experiments areas. The area of about one faddan was selectedand divided into four replicates and deprived from pesticide application. Finally, the experimentswere designed as completely randomized block design in each of study investigated locations.

Survey and population density of pests infestedsesame plants:

Two sampling techniques were used for surveying and determining population of sesamepests, i.e.; plant sample and sweeping net.

1. Plant samples technique:

Early in the season, weekly samples of 25 seedlings/ replicate (four replicates) were chosen randomly just after emergence of seedlings tell true leaves formation; Samples were taken early in the morning and kept in tightly closed paper bags and transferred to the laboratory for examination using binocular stereo- microscope.

When the true leaves of sesame plants were formed, the sesame plants were inspected actually in the field tell to the end of investigated seasons; where the sample of 25 leaves / replicate (four replicates) from the different levels of plant canopy were investigated until the end of growing season of sesame plants. The all individuals of the pest'sstages and associated natural enemies species were sorted; identified (for survey) and the numbers of the main pest's species were recorded. In the same trend the samples of 25 The whole plants /replicate (four replicates) were inspected actually in the field to count all stages of green stink bug, coccinelid beetles, Aphid lion, orius bugs, were recorded for the whole tested plants early in the morning.

a. ***Sweeping technique*****:**

Sweeping net (30 cm diameter and 55 cm deep, made of muslin cloth with wooden holder of 70cm length) was used to collect flying insects. Samples of 25 double strokes of sweeping net were taken weakly by walking in diagonals in the four replicates in the experimental fields of sesame. The catch of each replicate was put in plastic sacks, transferred to laboratory, and then anesthetized using chloroform, where insects were sorted, classified, counted and recorded.

1.1.1. ***Statistical analysis of data*****:**

The relationship between population densities of surveyed pests and some weather factors (mean oftemperature and relative humidity) were

computed as simple (b), partial regression (r^2); simple , multiple correlation (R^2) and explained variance were deduced, according to Little and Hills(1975) using costat software program.

RESULTS AND DISCUSSION

1) Survey and population density of pests and associated natural enemies on sesame plants:

a) Survey of pests and associated natural enemies on sesame plants

The results in Table (1) revealed that, the sesame plants were infested with four species of leafhoppers [three belonging genus Empoasca, *E.lybica*(de Berg), *E.decipiens* (Poali), *E.decedens* plus to one of*Orosius*sp], two species of aphids [cotton aphids, *Aphisgossypii* (Glov.); green peach aphids, *Myzuspersicae* (Sulz)] one species of whiteflies [cotton whitefly, *Bemisiatabaci* (Genn.)] one species of thrips [onion thrips, *Thripstabaci* (Lind.)] one species of stink bugs [green stink bug, *Nezaraviridula* L.], two species of mired bugs [Green mirid bug, *Creontiades*sp. and Tomato bug, *Nesidiocoristenuis*, three species of lipdopterous worms [Cotton bollworm, *Helicoverpa*spp; Cotton leafworm, *Spodopteralittoralis*; sesame capsule borer, *Antigastracatalaunalis*Dup.] and one species of phytophagus mite [the two spotted spider mite, *Tetranychusurticea* (Koch).].

These results found in harmony with those of Weintraub and Beanland 2006 they reported that a number of insect species of the order Hemiptera have been demonstrated to be pests of sesame plants and that of Kinati (2017) who reported that the sesame plants infested with the sesame web worm (*Antigastra*phid, *Myzuspcatalaunalis* Dup., Cotton whitefly (*Bemisiatabaci*Genn.) and Green peach a*ersicae* (Sulz). Also, Ahirwar*etal*.,(2010);Bhadaurla*et al*.,(2000) and Navarajan, (2007) who stated that the whitefly occurrence was noted on sesame plants, the damage the whitefly incurred was not reasonable in the study areaand added that the insects are serious pests in case of sporadic occurrence only.

The main and dominant piercing–sucking pests recorded relatively high mean numbers were leafhoppers species, (13.62 and 15.64 individuals/leaf during the two seasons, respectively), *T. urticea*was recording to 16.42 and 14.9 individuals/leaf during the two seasons, respectively, *M. persicae*recorded (9.88 and 18.13 individuals/leaf during the two seasons, respectively), *T. tabaci*were (7.65 and 5.02 individuals/leaf during the two seasons, respectively) and *N. viridula* (2.46 and 2.75 individuals/plant during the two study seasons,

Table (1). Survey of pests and associated natural enemies on sesame plants at abo-hamad district Sharkia Governorate, Egypt during 2021 and 2022 seasons

English name	Scientific name	Arabic name	Family name	Order name	Occurrence rate
Pests species					
Green leafhoppers	*Empoasca lybica (de Berg).*	El jassid	Cicadellidae	Hemiptera	+++
	Empoasca decipiens (Paoli)				
	Empoasca decedens				
Brown leafhoppers	*Orosius* SPP.				
Aphids	*Aphis gossypii* (Glov.)	Al men	Aphididae	Hemiptera	+
	Myzus persicae (sulz.)				+++
Cotton whitefly	*Bemicia tabaci* (Genn.)	Zobaba bidaa	Aleurodidae	Hemiptera	+
Onion thrips	*Thrips tabaci* (Lind.)	Treps	Thripidae	Thaythanoptera	+++
Green stink bug	*Nezara viridula*	Baket khadra	pentatomidae	Hemiptera	+++
Green mirid bug	*Creontiades sp*	Baket wrak khadra	Miridae	Hemiptera	+
Tomato bug	*Nesidiocoris tenuis*	Baket el tamatem	Miridae	Hemiptera	+
American Cotton bollworm	*Helicoverpa spp.*	Dodet loz el cotton	Noctuidae	Lepidoptera	+
Cotton leafworm	*Spodoptera littoralis.*	Dodet wrak el cotton	Noctuidae	Lepidoptera	+
Sesame capsule borer	*Antigastra catalaunalis* (Duponchel	Thakebt koron alsesem	Pyralida	Lepidoptera	+
Two spotted spider mite	*Tetranychus urticea* (Koch)	Acaros	Tetranychidae	Acari	+++
Natural enemies species					
Syrphus flies	*Syrphus spp.*	Zobab el sarfus	syrphidae	Diptera	+
Ladybirds beetles	*Coccinella spp.*	Abo el eid	Coccinellidae	Coleoptera	++
Green lacewing	*Chrisoperella carnea* (Steph)	Asad al men	Chrysopidae	Neuroptera	++
Minute pirate bug	*Orius spp.*	Baket al orius	Anthocoridae	Hemiptera	++
Predacious mite	*Phytoseiulus* sp.	Moftersate acaros	Phytoseiidae	acari	+

respectively) followed by *B. tabaci* and last species in very low numbers. These results found agree with those of Kabeh, (2017**)** who mentioned that the thrips, *T. tabaci*and green peach aphids, *M. persicae*were are considered among the dominantinsect species on sesame plants

In addition the obtained data show that, there were four species of insect predators [lady bird beetles, *Coccinella* spp.; green lace wing, *Chrisoprellacarnea* (Steph.); Syrphus flies, *Syrphus* spp. and Minute pirate bug, *Oriusalbidipennis*Reut.] and one of the mite predator [*Phytoseiulus* sp.] found associated with pests on sesame plants under field conditions in relatively low numbers. The obtained results of associated natural enemies were found in agreement with those of Thangjam and Vastrad (2018) they reported that among the natural enemies recorded on sesame plants were *Coccinella* spp., *Hormonia* sp. , *Scymnus* sp. and *Chrisoprella*sp..

b) Population density of certain pests infesting sesame plants:

i) Leafhoppers, Empoasca spp.:

Data in Table (2) revealed that the Leafhoppers, *Emposca* spp. were infested sesame plants from early-June to mid-September during the 2021 season and from mid- June to end of September at the 2nd season. The population of *Empoasca*spp. was started in relatively low numbers; then increased gradually and fluctuated slightly formed two weak peaks during the two studies seasons, during the 1st season the relatively highest peak of 49.5 individual/ leaf on 13, August 2021, while during the secondseason, the highest peak of 33.5 individual/ leaf was recorded on 21th, August2022.

The statistical analysis of simple, partial regression (b), simple(r2) , multiple correlation (R^2) and explained variance(EV%) in Table (3) cleared that, there were insignificant positive correlation between leafhoppers mean numbers and means temperature during the two seasons, while the relationship was Significant with means relative humidity (r= 0.59** for the two seasons. In the same trend, insignificant partial regression was resulted for mean temperature during the two study seasons and during the 1st season for relative humidity, whereas it get significant effect on Leafhoppers, *Empoasca*spp. during the 2nd season.

Also, the combined effect of the two tested weather factors, as explained variance (EV %) revealed highly/or significant positive effect with values of 35.04 and 24.58 were computed during the two investigated seasons, respectively.

The getting results found in harmony with those of Mahmoud (2013) and Bhura*et al*., (2020) who stated that the leafhoppers, *Empoasca*sp. was one of importance pests of sesame plants, and that of Mishra *et al*.,(2015) who

Table (2) Population density of certain pests infesting sesame plants and associated natural enemies at Abo Hammad, Sharkia Governorate, Egypt during 2021 and 2022 seasons.

Date	2021							Date	2022						
	Empoasca spp.	Myzus persicae	Neoaeolothrips tabaci	Thrips tabaci lind	Tetranychus urticae	Weekly mean temperature	Weekly mean rdative humidity		Empoasca spp.	Myzus persicae	Neoaeolothrips tabaci	Thrips tabaci lind	Tetranychus urticae	Weekly mean temperature	Weekly mean rdative humidity
4 Jun.	0.00	0.00	0.00	0.00	5.50	28.00	43.29	11 Jun.	2.50	0.00	0.00	0.00	5. 25	28.85	50.14
11	3.25	0.00	0.50	1.50	14.25	27.71	37.57	18	2.50	1. 25	0.00	0.25	11.50	28.71	41.36
18	6. 50	0.50	1.25	2.25	26.50	27.14	54.57	26	10.50	6.50	0.00	2.25	19.25	27.56	46.36
25	12.50	3.50	1.25	5.25	31.25	26.43	49.57	3 Jul.	7.25	11.25	0.50	3.50	25.25	27.49	42.19
2 Jul.	21.50	9.00	2.50	9.25	37.50	26.86	53.29	10	25.25	14.25	1.25	6.25	33.50	26.92	53.36
9	9.25	9.50	2.25	4.25	24.25	29.57	54.43	16	31.00	20.50	2.25	3.00	21.25	29.80	53.57
16	3. 25	14.25	7.25	1.50	18.25	31.14	52.57	24	18.50	31.25	7 50	0.50	9.50	30.48	53.00
23	15.50	10.50	5.50	7.25	15.50	31.43	52.00	30	12.25	26.25	8.25	5.25	9.50	31.27	50.00
30	30.25	13.50	2.25	14.25	11.00	31.57	59.00	6 Agus.	25.25	22.25	2.25	9.25	10.50	30.91	51.93
6 Agus.	33.25	20.00	0.25	15.50	10.50	32.29	57.14	14	31.00	28.50	0.25	11 25	5.50	30.75	53.86
13	49.50	26.50	0.50	22.25	20.25	30.86	60.29	21	33.50	36.25	2.50	15.50	11.25	29.92	52.64
20	27.25	17.50	2.25	12.25	11.50	30.71	59.00	27	23.25	43.25	5.25	9.00	25.25	30.32	55.36
27	24.50	12.50	4.50	11.50	11.00	30.43	55.57	3 Sept.	18.25	20.25	6.50	8.25	16.50	29.65	53.62
3 Sept.	9.25	7.50	1.25	4.25	5.50	29.14	57.57	10	5.50	17.50	4.25	3.00	10.50	30.63	54.43
10	3 25	3.50	0.50	1.50	1.50	28.57	57.86	17	2.25	5.50	0.25	0.25	2.25	29.17	48.57
								24	0.00	3.66	0.00	0.99	1.16	28.32	50.36

reported that insignificant correlation was recorded between *Empoasca* sp. Mean numbers and temperature.

ii) Green peach aphids, MyzuspersicaeZull:

The tabulated data in Table (2) cleared that the occurrence periods of the Green peach aphids, *M. persicae*on sesame plants were extended from 2nd week of April to the 3rd week of September during 2021 season, and from 3rd week of April to the 1st week of October at the 2022 season. The population of green peach aphids was started in relatively low numbers; then increased gradually, fluctuated and build up two weak peaks, the relatively high one of 26.5 individual/ leaf on 13 , August 2021 and that of 43.25 individuals / leaf on 27, August during the second season,

The results in Table (3) showed that, there were significant/or highly significant positive correlation coefficient between mean numbers of *M. persicae*and each of temperature means (r= 0.64** and 0.63**) and relative humidity means (r= 0.62* and 0.61**). On the same trend, the effect of tested climatic factors each in present of other as partial regression revealed highly significant effect for mean temperature during 1st season b1=2.39** and significant b1=4.07* in the 2nd study seasons; while the means relative humidity was recorded significant effect, b2= 0.45* and 1.29** resulted during 1st and 2nd study seasons, respectively.

In addition, the combined effect of the two tested weather factors, as explained variance (EV %) revealed highly significant positive effect with values of 65.29 and 47.23% during the 1st and 2nd seasons, respectively. the obtained results were found in harmony with those of Mahmoud (2012)who reported that the main piercing-sucking insect associated with sesame plants were, a leafhopper *Empoascalybica*, the most dominant followed by Green peach aphid *Myzuspersicae.* Also, the findings of Muzaffar*et al.*, (2002) found support these results

iii) *Green stink bug,Nezaraviridula* L.:

The present data in Table (2) revealed that the Green stink bug *N. viridula* start to infest sesame plants throughout the period from the 2nd week of June to the 2nd week of September during 2021season, and from 1st week of July to the 3rd week of September at 2022 season. The population of green stink bugwas oscillated throughout the two study seasons with two weak peaks, the relatively high one of 7.75 individual/ leaf recorded at 16th , July 2021 and of 8.25 at 16th , July 2022.

The results of statistical analysis in Table (3) revealed highly significant positive correlation between mean numbers of *N. viridula* and means

Table (3) Partial regression, multiple correlation and combined effect values as relationships between pests mean numbers on sesame plant and tested climatic factors during 2021 and 2022 seasons.

Variables	Calculated parameter		2021					2022				
			Empoasca	*Myzuspersicaesulz*	*Thripstabaci*	*Nezaraviridula* L.	*Tetranychusuriticae*	*Empoasca*	*Myzuspersicaesulz*	*Thripstabaci*	*Nezaraviridula* L.	*Tetranychusuriticae*
Temp. Mean	Partial reg.	b1	2.36	2.39	2.19	0.48	-2.81	0.37	4.07	0.53	1.10	-4.17
		S.E	1.84	0.73	0.83	0.33	1.56	2.29	2.13	0.96	0.52	1.89
		t	1.2	3.25	1.42	1.45	-1.79	0.15	1.92	0.55	2.11	-2.20
		p	n.s	**	n.s	n.s	n.s	n.s	*	n.s	*	*
	Simple corr.	r	0.34	0.64	0.36	0.62	-0.42	0.34	0.64	0.37	0.63	-0.43
		p	n.s	**	n.s	**	**	n.s	**	n.s	**	*
RH% mean	Partial reg.	b2	1.01	0.45	0.45	-0.04	0.29	1.57	1.29	0.44	0.12	0.76
		S.E	0.57	0.22	0.25	0.10	0.48	0.73	0.68	0.31	0.16	0.60
		t	1.8	1.99	1.77	-0.42	0.62	2014	1.90	1.43	0.76	1.26
		p	n.s	*	n.s	n.s	n.s	*	*	n.s	n.s	n.s
	Simple corr.	r	0.59	0.64	0.49	0.47	0.02	0.59	0.64	0.49	0.47	0.03
		p	*	**	*	**	n.s	**	**	*	*	n.s
Combined effects		EV%	35.04	65.29	37.37	1.7	8.7	24.58	47.23	13.96	32.77	16.07
		F	4.77	14.16	5.16	1.12	1.67	3.44	7.71	2.22	4.65	2..43
		p	*	**	*	n.s	n.s	*	**	n.s	*	n.s

temperature (r = 0.62** and 0.63**) and relative humidity (r= 0.59** and 0.48**) during the two study seasons, respectively. On the other hand, the effect of tested climatic factors as partial regression values revealed insignificant effect for means temperature at the 1st season and significant effect b1=1.10 during 2nd season, while relative humidity recorded insignificant effect during the two study seasons.

In the same trend, the combined effect of the two tested weather factors, as explained variance (EV %) revealed insignificant positive effect during the 1st season and significant effect of 32.77% during the 2nd study seasons. The obtained results found agree with those of Thangjam and Vastrad (2018) and

Henry *et al*., (2014) who indicated that the *N. viridula*was considered as a one of the major pests of sesame plants.

iv) The onion thrips, Thripstabaci Lind. :

The obtained results in Table (2) cleared that the onion thrips, *T. tabaci*was infested sesame plants from the 3rd week of June to the 2nd week of September during 2021season, while from 3rd week of June to the 4th week of September, 2022. The population of *T. tabaci*was oscillated with main two weak peaks during the two study seasons, during the 1st season the relatively high peak of 22. 25 individuals / leaf wasrecorded at 13th, August and of 15.5 individuals / leaf recorded at 21th, August 2022.

The statistical analysis results in Table (3) summarized that, there were, insignificant positive correlation between the means numbers of onion thrips and means temperature during the two seasons, while the relationship with mean relative humidity gained significant positive correlation (r=0.48* and 0.49* during 1st and 2nd seasons, respectively. The effects of the two tested climatic factorsas partial regression coefficients were Insignificant during the two study seasons.

In regard to combined effect of the two tested weather factors, as explained variance (EV %) the results showed significant positive effect during the 1st season EV% = 37.27 % while it was insignificant during the 2nd season. the findings of Muzaffar*et al.,* (2002) found support these results, were the thrips found attacks sesame plants throughout the hole growing season.

v) The two spotted spider mites,TetranychusurticaeKoch.:

The obtained results in Tables (2) cleared that thetwo spotted spider mites *T. urticae*was colonized sesame plants from the 1st week of June to the 2nd week of September during 2021season, and from 2nd week of June to the 4th week of September at 2022 season. The population of *T. urticae*was fluctuated slightly with main two peaks during the two study seasons, during the 1st one the relatively high peak of 37.5 individual/ leaf recorded at 2 , July 2021 and of 33.5 individual/ leaf recorded at 10 , July 2022.

The statistical analysis results in Table (3) showed that, there were significant negative correlation coefficients were observed between the mites mean numbers and mean temperature (r=-0.42* and -0.43*). In regard to correlation coefficients between mites mean numbers and means relative humidity, insignificant relationships were observed during the two study seasons. The partial regression coefficient as indicator parameter to the effects of tested factors revealed Insignificant effect during for mean temperature during the 1st season, while it was significant during the 2nd season only (b1= -

4.17), while the means relative humidity was affected mites population insignificantly during the two study seasons.

In the same trend, the combined effect of the two tested weather factors, as explained variance (EV %) revealed insignificant positive effects with EV % values of 1.7 and 16.07% during the 1st season and the 2nd seasons, respectively. the findings of Dossa*et al*., 2017; Waddington *et al*., 2010 found support these results, where the mite was consider as one of the major sesame pests. Also, this pest together with other factors such as other pests, use of unimproved seed and drought have been cited to be responsible for reduced yield.

Conclusively, it can be concluded that the leaf hopper (*Empoasca* spp.) infested sesame plants from June to end of September during the two seasons , also the green peach aphids, were extended from April to October.

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الحصر والكثافة العددية لآفات السمسم والأعداء الطبيعية المرتبطة بها

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أجريت الدراسات في الحقول المزروعة بنباتات لسمسم (صنف شندويل) خلال موسمي ٢٠٢١ و ٢٠٢٢ بمنطقة أبو حماد بمحافظة الشرقية بمصر، لحصر الآفات والأعداء الحيوية المرتبطة علي نباتات السمسم، ودراسة الكثافة العددية للآفات السائدة . وكانت الآفات التي سجلت متوسط تعداد عالي نسبيا هي، أنواع نطاطات الأوراق، والحلم النباتي ذو البقعتين ، ومن الخوخ الأخضر، وتربس البصل، والبقة الخضراء ، يليها الذبابة البيضاء واما باقي الانواع فقد تواجدت بأعداد منخفضة جدا. كذلك تم حصر أربعة أنواع من الحشرات المفترسة وحلم مفترس واحد جمبعها مرتبطة بالآفات على نباتات السمسم وكانت بأعداد منخفضة جدًا.

تم دراسة فترات تواجد وتقلبات تعداد أنواع الآفات الرئيسية مثل نطاطات الاوراق وحشرات من الخوخ الاخضر والبقة الخضراء وتربس البصل والحلم النباتي ذو البقعتين. تواجدت نطاطات الاوراق علي نباتات السمسم خلال الفترة من يونيو حتى نهاية سبتمبر خلال الموسمين حيث سجلت أعلى قمة نسبياً بلغت ٤٩.٥ فرد/ ورقة في ١٣ أغسطس خلال عام ٢٠٢١. كما امتدت فترات ظهور حشرة من الخوخ الأخضر من أبريل إلى أكتوبر وسجلت أعلى قمة ٤٣.٢٥. فرد/ورقة في ٢٧ أغسطس خلال موسم ٢٠٢٢. وفي نفس الاتجاه أصابت حشرة البقة الخضراء وتربس البصل نباتات السمسم خلال الفترة من يونيو إلى سبتمبر خلال الموسمين حيث سجلت أعلى قمم ٨.٢٥ فرد/ نبات و ٢٢.٢٥ فرد/ ورقة في موسمي ٢٠٢٢ و ٢٠٢١ للحشرتين على التوالي. كما وتواجد الحلم النباتي ذو البقعتين على نباتات السمسم خلال الفترة من يونيو إلى سبتمبر خلال الموسمين حيث سجل اعلى روة ٣٧.٥ فرد/ ورقة في ٢ يوليو خلال عام ٢٠٢١.

وتباينت تأثيرات العوامل الجزية على تعداد الآفات حيث ظهرأعلى تأثير معنوي بلغ ٦٥.٢٩% كتأثير مشترك (E.V%) لكل من متوسط درجة الحرارة والرطوبة النسبية على حشرات من الخوخ الاخضر، بينما بلغ أقل تأثير ١.٧% سجل على البقة الخضراء خلال الموسم الأول.

التوصية: من الدراسة نجد أن اكبر نشاط لنطاطات الاوراق علي نباتات السمسم خلال الفترة من يونيو حتى نهاية سبتمبر خلال الموسمين كما امتدت فترات ظهور حشرة من الخوخ الأخضر من أبريل إلى أكتوبر