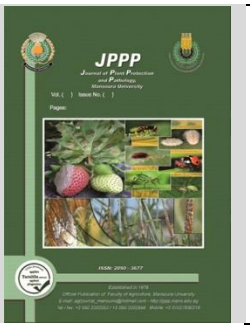
Journal of Plant Protection and Pathology

Journal homepage: www.jppp.mans.edu.eg
Available online at: www.jppp.journals.ekb.eg

Population Density of Pests Associated with Some *Phasoulus vulgaris* Varieties in Fayoum Governorate

Nada M. A. Hassan ; A. A. R. Rahil ; M. F. R. Mahmoud and Sherin H.M. Safar*

Plant Protection Dept., Fac. of Agric., Fayoum Univ., Fayoum, Egypt



ABSTRACT

Ecological studies on pests associated with three varieties of *Phaseoulus vulgaris*, namely, Bronko, Nibraska and Polista were carried out at Fayoum Governorate for two successive seasons 2016 and 2017. Survey revealed that, the existence of one species of mites, *Tetranychus urticae* Koch and four species of insects. Population densities and seasonal fluctuations in relation to weather conditions were estimated.

Keywords: *Phasoulus vulgaris*, Bronko, Nibraska, Polista, population densities.

INTRODUCTION

The kidney bean plant, *Phaseolus vulgaris* is one of the most important economic vegetable crops cultivated in Egypt and many countries of the world as a main source of protein. This crop is infested by many pests which cause damage in both quantity and quality. The mite, *Tetranychus urticae* Koch and some insects viz. *Thrips tabaci* (Lind.), *Bemisia tabaci* (Genn.) and *Liromyza* sp. are the majority pests infested kidney bean cultivars. *Phaseolus lunatus* L. also known as Lima bean is one of the four species of the genus *Phaseolus* that are economically exploited (Santos *et al*., 2002). The susceptibility of bean cultivars to the majority pests viz. *Tetranychus arabicus*, *T. urticae*, *B. tabaci* and *L. trifolii* (Burg.) were conducted (Doss *et al*., 1995; Habashy, 2000 and Abd El Gawwad, 2008). In relation between pest's infestations and some weather factors viz. temperature and relative humidity, numerous studies are accessible on this relation were conducted (Ghallab, 2001; Abd El Gawwad, 2004 & 2008 and Shalaby, 2004). Bean plant, *Ph. vulgaris* L. is one of the most important leguminous vegetable crops in Egypt. It is considered of great nutritive value, containing relative high percentage of protein. Although *T. urticae* is primarily a pest of protected crops in the United Kingdom, it also damages several crops outdoors, particularly in hot dry summers. The spider mite has a wide food-plant range. Strawberries, hops, beans (especially French beans *[Ph. vulgaris*], black currants, cane fruits, wall-trained fruit trees and many ornamentals (particularly violets) are frequently attacked (Cross, *et al*, 1984).

Two-spotted spider mite is one of the most important pests of common bean that causes significant losses on bean yield. Use of resistant cultivar is the most economical and effective way to control this mite (Tahmasebi, *et al*, 2009).

The impact of weather parameters on insect and mite pests infesting French bean (*Ph. vulgaris*) during 2013-14 and 2014-15. The weather parameters had a significant impact on population buildup of various French bean crop pests. (Sharmah, *et al*, 2017).

The main objective of this study is to determine the population densities of pests associated with three bean varieties namely; Bronko, Nibraska and Polista.

MATERIALS AND METHODS

Field experiments were conducted at Demo farm, Faculty of Agriculture, Fayoum University, Egypt during the period from 20 March 2016 till 18 June 2017 on three *Phaseolus vulgaris* varieties; Bronko, Nibraska and polista to maintain the populations of associated pests. The populations were recorded weekly interval. The correlation of weather factors (temperature and relative humidity) on pest populations was studied.

Survey of pests associated with bean plants *Phaseolus vulgaris* L. was carried out from March 2016 to June 2017. Samples were collected from *P. vulgaris* varieties namely; Bronko , Nibraska and Polista, which planted in the faculty of agriculture farm at Demo (Fayoum district) in March 2016 in an area of 1/4 feddan each (25 lines/Sort, 3m long).

Collection and count of mites and insects started two weeks after planting and continued weekly for two seasons (from march to June).

Twenty seven periodic random samples of whole plants were collected and placed in polyethylene bags, closed and transferred to the laboratory for examination under stereomicroscope directly for associated pests.

Population fluctuations of pests were estimated for the two successive years of study as numbers of mobile stages.

The relationship between numbers of pests and the main weather factors (average temperature and relative

* **Corresponding author.**
E-mail address: Shm02@fayoum.edu.eg
DOI: 10.21608/jppp.2020.166215

humidity) were statistically determined using the simple correlation method.

The daily average of temperature and humidity were obtained from the official Meteorological Station, Fayoum Governorate.

RESULTS AND DISCUSSION

Data presented in Table (1), showed the five pests associated with three varieties of *Ph. vulgaris* during two successive seasons 2016 and 2017. On Bronko variety, the mean number of *T. urticae* was 79.0 individuals compared with 229.7, 11.54, 662.23 and 35.7 individuals for *B. tabaci, L. trifolii, A. gossypii* and *T. tabaci*, respectively, while during season 2017, the mean number of *T. urticae* and the same pests were 25.5, 78.39, 3.1, 393.4 and 28.14 individuals, respectively.

On Nibraska variety, the mean number of *T. urticae* was 97.31 compared with 253.12, 8.3, 523.31 and 49.4 individuals for *B. tabaci, L. trifolii, A. gossypii* and *T. tabaci*, respectively, while during season 2017, the mean number of *T. urticae* and the same pests were 91.8, 227.4, 8.2, 756.6 and 109.6 individuals, respectively.

On Polista variety, the mean number of *T. urticae* was 67.31 compared with 71.9, 3.6, 287.46 and 27.69 individuals for *B. tabaci, L. trifolii, A. gossypii* and *T. tabaci*, respectively, while during season 2017, the mean number of *T. urticae* and the same pests were 25.9, 93.6, 6.5, 384 and 88.3 individuals, respectively.

These data illustrated that Nibraska cultivar is the most susceptible variety of the three examined varieties.

In general, the mean total number of *A. gossypii* was the highest compared with other pests during the two successive seasons while the mean number of *L. trifolii* was the lowest

Data in Table (2), cleared that, the numbers of *T. urticae, L. trifolii, A. gossypii* and *T. tabaci* start beginning in March with the mean numbers of 4, 8.5, 136.5 and 20 indiv. and reached to the highest populations in April with the mean average of 26.5, 1052 and 87.25 except *T. urticae* which reached the highest population in June with an average of 189 individuals.

Also, data revealed that, the infestation with *B. tabaci* was started late in April compared with other pests with an average of 230.8 and reached the highest population in May with an average of 408.4

Data obtained showed that, on Bronko variety, during 2016 season , *A. gossypii* population compared with other pests population was the highest with an average of 662.23 and followed by *B. tabaci, T. urticae, T. tabaci* and *L. trifolii* with averages 229.7, 79, 35.7 and 11.54 individuals, respectively.

Data in Table (3) recorded that, the numbers of *T. urticae, L. trifolii, A. gossypii* and *T. tabaci* started beginning in March with the mean numbers of 17, 6, 196 and 36 individuals, while *B. tabaci* was started late in April compared with other pests with an average of 205.15 and reached the highest population in May with an average of 409.

The five pests were different from each other on reaching the highest population as *L. trifolii* and *T. tabaci* reached to the highest populations in April with the mean average of 24 and 127.5 but *B. tabaci* and *A. gossypii* in May with the mean average of 490 and 850.2 while *T. urticae* reached the highest population late in June with an average of 161 individuals.

Table 1. Mean numbers of collected pests on three *Phaseolus vulgaris* varieties during 2016 and 2017 seasons at Fayoum Governorate.

Pests	Population density / 20 plants					
	2016			2017		
	Bronko	Nibraska	Polista	Bronko	Nibraska	Polista
Tetranychus urticae	79.0	97.31	67.31	52.5	91.8	52.9
Bemisia tabaci	229.7	253.12	71.9	78.39	227.4	93.6
Liromyza trifolii	11.54	8.3	3.6	3.1	8.2	6.5
Aphis gossypii	662.23	523.31	287.46	393.4	756.6	384
Thrips tabaci	35.7	49.4	27.69	28.14	109.6	88.3

Table 2.Population density of *Ph. vulgaris* var Bronko pests during 2016 season.

Sampling dates	Numbers/20 plant					Weekly mean	
	Tetranychus urticae	*Bemisia tabaci*	*Liromyza trifolii*	*Aphis gossypii*	*Thirps tabaci*	Temp.	RH%
March 20	4	0	0	128	0	19.4	40
March 27	4	0	17	145	40	24.6	39
Monthly mean	4	0	8.5	136.5	20	22	40
April 3	25	31	67	520	58	23.3	43
April 10	31	130	1	572	57	30.6	39
April 17	48	233	19	1488	121	28.8	44
April 24	27	529	19	1628	113	31.6	38
Monthly mean	32.8	230.8	26.5	1052	87.25	28.6	41
May 1	55	1031	5	1678	33	32.6	36
May 8	54	475	2	831	17	31.1	36
May. 15	79	155	8	734	5	34.6	29
May.22	158	242	10	616	14	32.04	35
May.29	164	139	2	269	6	29.7	43
Monthly mean	102	408.4	5.4	825.6	15	32.008	36
June 5	311	21	0	0	0	35.5	35
June 12	67	0	0	0	0	35.8	38
Monthly mean	189	10.5	0	0	0	35.7	37
Total	1027	2986	150	8609	464		
Mean	79	229.7	11.54	662.23	35.7		

Table 3. Population density of *Ph. vulgaris* var Nibraska pests during 2016 season.

Sampling dates	Numbers/20 plant					Weekly mean	
	Tetranychus urticae	*Bemisia tabaci*	*Liromyza trifolii*	*Aphis gossypii*	*Thirps tabaci*	Temp.	RH%
March 20	11	0	0	161	0	19.4	40
March 27	23	0	12	231	72	24.6	39
Monthly mean	17	0	6	196	36	22	40
April. 3	27	30.6	44	393	208	23.3	44
April 10	53	222	27	672	71	30.6	39
April 17	34	148	9	492	89	28.8	44
April 24	62	420	16	603	142	31.6	38
Monthly mean	44	205.15	24	540	127.5	28.6	41
May 1	77	769	0	1249	44	32.6	36
May 8	151	482	0	883	9	31.1	36
May 15	121	688	0	1693	0	34.6	29
May 22	184	352	0	277	7	32.04	35
May 29	200	159	0	149	0	29.7	43
Monthly mean	146.6	490	0	850.2	12	32.008	36
June 5	204	20	0	0	0	35.5	35
June 12	118	0	0	0	0	35.8	38
Monthly mean	161	10	0	0	0	35.7	37
Total	1265	3290.6	108	6803	642		
Mean	97.3	253.12	8.3	523.31	49.4		

Data presented on Nibraska variety, during 2016 season was as the same with Bronko variety as *A. gossypii* population compared with other pests population was the highest with an average of 523.31 and followed by *B. tabaci, T. urticae, T. tabaci* and *L. trifolii* with averages 253.12, 79.3, 49.4 and 8.3 individuals, respectively.

Population density of *T. urticae* and *B. tabaci* continued to the end of the season while *L. trifolii, A. gossypii* and *T. tabaci* disappeared.

Data in Table (4), revealed that, the numbers of all pests start beginning in March and continued to the end of season except *L. trifolii* and *T. tabaci* which disappeared in June. *L. trifolii, A. gossypii* and *T. tabaci* reached to the highest populations in April with the mean average of 7.5, 418.75 and 54.25 while *T. urticae* reached the highest population in June with an average of 160 individuals.

Data presented that on Polista variety, during 2016 season , *A. gossypii* population compared with other pests population was the highest with an average of 287.46 and followed by *B. tabaci, T. urticae, T. tabaci* and *L. trifolii* with averages 71.9, 67.31, 27.69 and 3.9 individuals, respectively.

Table 4. Population density of *Ph. vulgaris* var Polista pests during 2016 season.

Sampling dates	Numbers / 20 plant					Weekly mean	
	Tetranychus urticae	*Bemisia tabaci*	*Liromyza trifolii*	*Aphis gossypii*	*Thirps tabaci*	Temp.	RH%
March.20	18	2	0	147	0	19.4	40
March 27	9	0	3	300	109	24.6	39
Monthly mean	13.5	1	1.5	223.5	54.5	22	40
April 3	12	21	1	274	12	23.3	44
April 10	21	0	15	435	94	30.6	39
April 17	47	256	7	662	73	28.8	44
April 24	16	68	7	304	38	31.6	38
Monthly mean	24	111.25	7.5	418.75	54.25	28.6	41
May.1	26	31	2	245	17	32.6	36
May.8	152	10	0	400	0	31.1	36
May. 15	51	64	8	734	3	34.6	29
May.22	137	228	4	74	14	32.04	35
May.29	66	242	0	154	0	29.7	43
Monthly mean	86.4	115	2.8	321.4	6.8	32.008	36
June 5	201	13	0	8	0	35.5	35
June 12	119	0	0	0	0	35.8	38
Monthly mean	160	6.5	0	4	0	35.7	37
Total	875	935	47	3737	360		
Mean	67.31	71.9	3.6	287.46	27.69		

Data in Table (5), indicated that, the *T. urticae* correlation value with temperature was positively significant on Bronko and Polista varieties (r=0.538 , 0.591) respectively , and was high positively significant on Nibraska variety (0.667) while the correlation values with R.H% were negative insignificant all over three varieties.

The results in Table (6), all pests start beginning in March with the mean numbers of 63, 17.5, 3, 99 and 10 individuals, for *T. urticae, B. tabaci, L. trifolii, A. gossypii* and *T. tabaci*, respectively. The numbers of *T. urticae* reached to the highest population in May while *L. trifolii* and *A. gossypii* reached to the highest populations in April and at the end of the season *Bemisia tabaci and T. tabaci* reached to the highest population in June.

The same result of the pests population in the two successive seasons 2016 and 2017 that *A. gossypii* population compared with other pests population was the highest.

Table 5. Correlation between weather factors and population of *T. urticae* and other insects on three varieties of *Ph. vulgaris* during 2016 season at Fayoum Governorate.

Variety	Factor	Value	*T. urticae*	*B. tabaci*	*A. gossypii*	*L. trifolii*	*T. tabaci*
Bronko	Temp.	R	0.538*	0.287	0.159	-0.427	-0.151
		P	0.058	0.342	0.603	0.146	0.623
	RH%	R	-0.243	-0.183	0.012	0.433	0.458
		P	0.423	0.550	0.969	0.140	0.116
Nibraska	Temp.	R	0.667**	0.443	0.267	-0.405	-0.380
		P	0.013	0.129	0.377	0.170	0.201
	RH%	R	-0.370	0.592*	-0.559*	0.467	0.505
		P	0.213	0.033	0.047	0.108	0.078
Polista	Temp.	R	0.591*	0.088	-0.027	0.151	-0.237
		P	0.033	0.775	0.931	0.622	0.435
	RH%	R	-0.344	0.304	-0.123	-0.151	0.268
		P	0.249	0.312	0.688	0.623	0.375

Numbers followed by star are significant (P- value < 0.05)

Table 6. Population density of Ph. vulgaris var Bronko pests during 2017 season.

Sampling dates	(Numbers/ 20 plant)					Weekly mean	
	Tetranychus urticae	*Bemisia tabaci*	*Liromyza trifolii*	*Aphis gossypii*	*Thirps tabaci*	Temp.	RH%
Mar.19	29	30	5	105	10	17.7	39
Mar. 26	34	5	1	93	0	19.5	43
Monthly mean	63	17.5	3	99	10	18.6	41
Apr. 2	40	0	0	70	3	25.2	39
Apr. 9	40	130	16	513	89	25.9	42
Apr. 16	63	225	5	1530	73	26.1	43
Apr.23	43	109	0	651	16	27.6	33
Apr.30	77	91	0	151	19	27.9	38
Monthly mean	52.6	111	4.2	583	40	26.5	39
May.7	65	18	0	331	11	29.2	39
May. 14	79	10	11	211	0	32.4	31
May.21	65	17.5	0	121	0	33.2	38
May.28	48	97	0	315	0	30.6	33
Monthly mean	64.25	35.6	2.75	244.5	2.75	31.4	35
Jun.4	45	73	0	111	113	33.3	33
Jun.11	65	81	5	875	19	27.2	32
Jun.18	42	211	0	431	41	34	31
Monthly mean	50.7	121.7	1.7	472.3	57.7	31.5	32
Total	735	1097.5	43	5508	394		
Mean	52.5	78.39	3.1	393.4	28.14		

Data arranged in Table (7), showed that all pests start beginning in March with the mean numbers of 62, 12, 2.5, 158 and 10.5 individuals, for *T. urticae*, *B. tabaci*, *L. trifolii*, *A. gossypii* and *T. tabaci*, respectively. The numbers of *T. urticae* and *A. gossypii* reached to the highest population in May while *L. trifolii* reached to the highest populations in April and at the end of the season *Bemisia tabaci and T. tabaci* reached to the highest population in June.

Table 7. Population density of *Ph. vulgaris* var Nibraska pests during 2017 season.

Sampling dates	Numbers/ 20 plant					weekly mean	
	Tetranychus urticae	*Bemisia Tabaci*	*Liromyza Trifolii*	*Aphis Gossypii*	*Thirps tabaci*	Temp.	RH%
March 19	33	21	4	143	21	17.7	39
March 26	91	3	1	173	0	19.5	43
Monthly mean	62	12	2.5	158	10.5	18.6	41
April 2	16	0	0	100	5	25.2	39
April 9	65	222	22	614	93	25.9	42
April 16	85	140	9	592	122	26.1	47
April 23	75	351	0	1250	103	27.6	33
April 30	87	401	21	920	140	27.9	38
Monthly mean	65.6	222.8	10.4	695.2	92.6	26.5	39
May 7	188	310	0	1132	4	29.2	39
May 14	123	91	31	401	0	32.4	31
May 21	126	109	0	1351	17	33.2	37
May.28	103	211	5	1090	0	30.6	33
Monthly mean	135	108.25	9	993.5	5.25	31.4	35
June 4	74	110	0	311	910	33.3	33
June 11	135	503	10	1014	51	27.2	32
June 18	84	711	12	1501	69	34	30
Monthly mean	97.7	441.3	7.3	942	343.3	31.5	32
Total	1285	3183	115	10592	1535		
Mean	91.8	227.4	8.2	756.6	109.6		

Data obtained in Table (8) and as the same of Tables (6) and (7), all pests start beginning in March with the mean numbers of 38, 3.5, 1, 84 and 7.5 individuals, for *T. urticae*, *B. tabaci*, *L. trifolii*, *A. gossypii* and *T. tabaci*,

respectively. The numbers of all pests reached to the highest population at the end of the season in June except *T. urticae* reached to the highest populations in May.

The results obtained in Table (9), indicated that the *T. urticae* correlation value with temperature was positively insignificant on Bronko, Nibraska and Polista varieties (r = 0.445, 0.437 and 0.133) respectively, while the correlation values with R.H% were negatively insignificant on Bronko and Nibraska varieties (r= -0.022, -.0162) and positively insignificant on Polista variety (r=0.155).

Table 8. Population density of Ph. vulgaris var Polista pests during 2017 season.

Sampling	Numbers/ 20 plant					weekly mean	
Date	*Tetranychus urticae*	*Bemisia tabaci*	*Liromyza trifolii*	*Aphis gossypii*	*Thirps tabaci*	Temp.	RH%
Mach 19	19	7	1	97	15	17.7	39
Mach 26	57	0	1	71	0	19.5	43
Monthly mean	38	3.5	1	84	7.5	18.6	41
April 2	42	1	0	20	10	25.2	39
April 9	42	150	5	222	71	25.9	42
April 16	56	95	11	610	59	26.1	47
April 23	39	71	0	311	41	27.6	33
April 30	86	53	11	310	89	27.9	38
Monthly mean	53	74	5.4	294.6	54	26.5	39
May 7	115	41	0	509	5	29.2	39
May 14	57	100	9	191	0	32.4	31
May 21	49	79	0	290	90	33.2	37
May 28	46	121	1	405	0	30.6	33
Monthly mean	66.8	85.3	2.5	348.8	23.8	31.4	35
June 4	41	91	0	791	720	33.3	33
June 11	64	101	21	948	33	27.2	32
June18	28	401	31	601	103	34	30
Monthly mean	44.3	197.7	17.3	780	285.3	31.5	32
Total	741	1311	91	5376	1236		
Mean	52.9	93.6	6.5	384	88.3		

Table 9. Correlation between weather factors and population of pests on three varieties of *Phaseolus vulgaris* during 2017 season at Fayoum Governorate.

Variety	Factor	Value	*T. urticae*	*B. tabaci*	*A. gossypii*	*L. trifolii*	*T. tabaci*
Bronko	Temp.	R	0.445	0.304	-0.008	-0.164	0.194
		P	0.111	0.290	0.978	0.576	0.505
	RH%	R	-0.022	0.039	0.275	0.177	0.164
		P	0.941	0.895	0.341	0.546	0.576
Nibraska	Temp.	R	0.437	0.428	0.594*	0.182	0.320
		P	0.118	0.127	0.025	0.534	0.264
	RH%	R	-0.162	-0.477	-0.403	-0.131	-0.174
		P	0.580	0.085	0.153	0.654	0.552
Polista	Temp.	R	0.133	0.571*	0.480	0.289	0.389
		P	0.651	0.033	0.083	0.316	0.169
	RH%	R	0.155	-0.444	-0.326	-0.323	-0.231
		P	0.596	0.112	0.256	0.259	0.464

Numbers followed by star are significant (P- value < 0.05)

Discussion

Results of the present study revealed that *T. urticae* and other associated insects infesting the previous three bean varieties named Bronko, Polesta and Nibraska and showed significant differences in their mite infestation which started appearing in March then increased gradually, the highest population of *T. urticae* was recorded in June during 2016 season and in May during 2017 season as the results mentioned by Fariba Mehrkhou, *et al.*, 2008, studied the population density and spatial distribution pattern of *T. urticae* and its predator *Stethorus gilvifrons* Mulsant on five bean varieties including *Phaseoulus vulgaris* var. Talash, *P. lunatus* var. Sadaf, *P. calcaratus* var. Goli, *P. calcaratus* var. Sun-ray and *Vigna sinensis* var. Parastoo were determined in the Tehran area, Iran, during 2005. Among bean varieties, the higher and lower density of the pest population was observed on Sun-ray (59.37 mites/leaf) and Parastoo (4.73 mites/leaf), respectively, and in this respect, El-Saad and Embarak, 2009, who studied the population fluctuation of *T. urticae*, and the predaceous thrips, *Scolothrips longicornis*, on cucumber and bean cultivars under greenhouse conditions. The obtained data showed that both of *T. urticae* and *S. longicornis* exhibited one peak on cucumber and beans. Peaks of *T. urticae* and *S. longicornis* occurred on the second and third weeks of April for bean and cucumber in both seasons (2007 and 2008). Bean showed significant differences among Novax, Kentacky wonder and A Slin wonder cultivars in their mite infestation. Generally, cucumber cultivars mounted lower numbers of *T. urticae* than bean cultivars. On the other hand, correlation between numbers of *S. longicornis* and the population density of ova and moving stages of *T. urticae* on all cucumber and bean cultivars in the 2 growing seasons was positive.

These results are different to these reported by Polat and Kasap, 2011, who studied the seasonal population development of *Tetranychus urticae* (Acari: Tetranychidae) on three different bean cultivars in five bean field of Van, during 2006-2007., namely *Phaseolus vulgaris* L. (green bean, white bean and gina F1 varieties). The population development of *T. urticae* started in July and reached a maximum in late September and early October.

In this respect, El-saidy, *et al*, 2012, studied that, Results showed significant differences between the two kidney bean cultivars for *T. urticae* population (adults, immature stages and eggs) in both seasons. In case of *T. tabaci*, *B. tabaci* and *Liromyza* sp., the susceptibility of the two cultivars to these insect infestations was also varied, as there was significant difference between them for *B. tabaci* in both seasons while for the other two pests there were no significant differences between their populations during the two seasons. The weather factors (maximum and minimum temperature and also the maximum RH%) had significant positive effects on population of *T. urticae* stags and *T. tabaci* on both seasons , while minimum RH% had negatively insignificant effect on the previous two pests and a significant effect on *B. tabaci*, *Liromyza* sp. during the two studied seasons 2010 and 2011.

Also, Rizk, *et al*, 2012, evaluated seven varieties of beans (*Phaseolus vulgaris L.*) for their relative susceptibility against some sap sucking pests *T. urticae*, *B.tabaci* , *Aphis craccivora* Koch, *T. tabaci* and leaf miner, *Liriomyza trifolii* (Burg.). The tested bean varieties were: Medina, R9251, Teresa, Luvalde, Al-Hanna, Alexandria and Excalibur. None of the varieties escaped the infestation of all these pests. And studied the population of *T. urticae* was higher in summer than in winter, while population of *B. tabaci* and *L. trifolii* were higher in winter.

And this respect, Amal , *et al* , 2013 . Studied the levels of infestation of two Faba bean (*Vicia faba*) varieties with *Tetranychus urticae* and its predatory Phytoseiid mite, *Typhlodrompis swiriskii* (Athias-Henriot) and some insect pests. The study was investigated the population density of two spotted spider mite *T. urticae* in Beheira governorate, Egypt, during 2010-2012 on two cultivars of broad bean, Sakha1 and Sakha3. Results showed that the infestation of two cultivars by *T. urticae* was early started in late Dec. Then, gradually increased and to reach their peaks during March for the two cultivars.

Avery closed result of that also obtained by Chauhan and Shukla, 2016, who studied the population dynamics of *T. urticae* on French bean cv. Gujarat rajmah and revealed that the incidence of *T. urticae* was started from the first week of Jan., increased gradually and reached to its peak during mid of May (14.27 mite/leaf) in the open field condition. The maximum, minimum, average temperature, evening and average relative humidity had significantly positive correlated with mite population .

These findings agreed with the finding of Basha, *et al*, 2018, who revealed that the initial incidence of the spider mite occurred in relatively few numbers of 1.60 & 0.84 individuals per leaf at the late February of both seasons 2016 and 2017, respectively on common bean *Phaseolus vulgaris* L. Cultivar Giza 9 plants at Kom-Hamada district, Beheira governorate, Egypt. The populations then started to increase and reached the highest density of 18.20 and 20.60 individuals per leaf in the first week of May during 2016 and 2017 seasons, respectively. Temperature appeared to be the most environmental factor affecting population build-up of this pest on the investigated crop.

From the previous results, it could be concluded that, the infestation of the two- spotted spider mite *T. urticae* on common bean plants under field conditions was observed at different growth stages of the crop. Population build- up of this pest was significantly affected by temperature degrees. These results may have some practical implications in reducing numbers of this pest.

REFERENCES

Abd El-Gawwad, S.A.Y.,(2008). Studies of integrated pest management on some pests of common bean plant Ph. D. Theis Fac. of Science, Al-Azhar Univ., pp: 409.

Abd El-Gawwad., S.A.Y.,(2004). Biological, Ecological and Biocontrol studies on some mites. M. Sc. Theis Fac. of Science, Al-Azhar Univ., pp: 197.

Amal H. M. Romeih, E.M.A. El-Saiedy and Salwa, M. E. Sholla (2013). Study the population dynamics of two spotted spider mite *Tetranychus urticae* Koch infesting two Faba bean cultivars. Life Sci J;10(3):1328-1333 . (ISSN:1097-8135).

Basha, M. A.; Mostafa, E.M.; Hendawi, M. Y.; Eleawa, M. and Shalaby, A. A. (2018). Seasonal abundance of the two- spotted spider mite *Tertranychus urticae* koch on common bean *Phaseolus vulgaris* L. Life Sci J;15(9):4247].

Chauhan, R. K.; Abhishek Shukla. (2016). Population dynamics of two spotted spider mite, *Tetranychus urticae* Koch on French bean (*Phaseolus vulgaris* L.). International Journal of Plant Protection; 9(2):536-539.

Cross, J.V and R.A, Umpelby, (1984). Two spotted spider mite on outdoor crops. Leaflet, Ministry of Agriculture, Fisheries and food, UK;.(226):6pp.

Doss, S.A., S.M. Ibrahim, N.G. Iskander and A.K.F. Iskander, (1995). Relative susceptibility of three bean cultivars planted under plastic green house to both of leaf miner, Liromyza trifolii(Burgess) and spider mite, Tetranychus arabicusAttiah. Bull. Entomo. Soc. Egypt., 73: 135-142.

El-Saad AKA and Embarak MZ (2009). Population fluctuation of *Tetranychus urticae* Koch and its predaciousthrips, *Scolothrips longicornis* Priesner on cucumber and bean varieties, under green-house conditions. Alex J Agric Res 54(3):41–48.

El-saidy, E.M.A.; Abou-Zaid and A.M.H. Maklad, (2012). Evaluation of the susceptibility of two kidney bean Cultivars to the infestation of the two spotted spider mite and some sap-suking insects and their relations with some abiotic factors. Journal of Applied Sciences Research; (November):5543-5549.

Fariba MEHRKHOU, Yaghoub FATHIPOUR, Ali Asghar TALEBI, Karim KAMALI, Bahram NASERI,(2008). Population Density and Spatial Distribution Patterns of *Tetranychus urticae* (Acari, Tetranychidae) and its Predator Stethorus gilvifrons (Coleoptera: Coccinellidae) on Different Agricultural Crops. J. Ent. Res. Soc. 10 (2): 23-36.

Ghallab, M.M.A., (2001). Ecological, Biological and Morphological studies on some predaceous mites (Suborder :Actinedida). Ph. D. Theis Fac. of Science, Cairo Univ., pp: 24.

Habashy, N.H.,(2000). Using alternative to pesticides for the control of mites infesting on some vegetable plants Ph.D. Thesis Inst. of Environ. Studies and Res., Ain Shams univ., pp: 183.

Polat, H.; I.Kasap,.(2011). Population dynamics of twospotted spider mite Tetranychus urticae Koch, 1836 (Acari: Tetranychidae) on three different bean cultivars in Van province. [Turkish]. Turkiye Entomoloji Dergisi;. 35(1):145-154.

Rizk, M.A; M.M Ghallab; N.H. Habashi and E,M Bakr, (2012). Abundance of leaf miner and some piercing sap sucking pests on some bean (*Phaseolus vulgaris*) Varieties . Egyptian Academic Journal of Biological Sciences :Entomology;.5(2):157-165.

Santos D, Corlett FMF, Mendes JEMF, Wanderley Júnior JSA.(2002). Produtividadee morfologia de vagens e sementes de varie-dades de fava no Estado da Paraíba. Pesquisa AgropecuáriaBrasileira 37:1407–1412.

Shalaby, S.H., (2004). Studies on the efficiency of some new pest control measures against certain pests of common bean. Ph. D. Theis Fac. of Agric., Moshtohor, Zigazig Univ., pp: 26.

Sharmah, D. ; S.Rahman, P. Debnath, A. Khound, (2017). Influence of weather factors on insect and mite pests infesting French bean (*Phaseolus vulgaris* L.), Assam, India. International Journal of Plant Protection . Vol.10 No.1 pp.157-166.

Tahmasebi, Z.; M. R. Bihamta; A. S Aboori; A.A. Kousair and H.R Dorri, (2009). Response of common bean genotypes to two spotted spider mite *Tetranychus urticae* Koch in greenhouse and field. Seed and plant Improvement Journal;.25-1(2):pe329- pe348,en2.

الكثافة العددية للافات المرتبطة ببعض اصناف الفاصوليا في محافظة الفيوم

ندى مجدى عبدالعظيم حسن ، أشرف عبد الحفيظ رضوان رحيل ، ماهر فؤاد رمضان محمود و شيرين حسن محمد صفر

كلية الزراعة – قسم وقاية النبات – جامعة الفيوم - مصر

استهدفت هذه الدراسة اجراء دراسات بيئية علي الافات الاكاروسية والحشرية المرتبطة بأصناف نبات الفاصوليا محل الدراسة (برونكو و نبراسكا و بوليستا) في محافظة الفيوم لعامي ٢٠١٦ و ٢٠١٧ في الفترة الزمنية من مارس الي يونية ومدي ارتباط هذه الكائنات الحية بدرجات الحرارة و الرطوبة النسبية. واثبتت عملية الحصر وجود نوع واحد من الأفات الاكاروسية وهو العنكبوت الاحمر ذو البقعتين واربعة أنواع من الافات الحشرية وهي الذبابة البيضاء *Bemisia tabaci* وصانعات الانفاق *Liromyza trifolii* ومن القطن والبصل *Aphis gossypii* والتربس *Thrips tabac*i . وكان العنكبوت الاحمر هو الافه الاساسية الأكثر تعداد علي نبات الفاصوليا صنف نبراسكا . واوضحت النتائج ان اعلي تعداد لاكاروس العنكبوت الاحمر في موسم ٢٠١٦ كان في شهر يونيه علي الاصناف الثلاثة بينما في موسم ٢٠١٧ كان اعلي تعداد له في شهر مايو بينما كان أعلى تعداد للذبابة البيضاء في شهر مايو في موسم ٢٠١٦ وابريل في ٢٠١٧ .