

INFLUENCE OF DIFFERENT VARIETIES AND PLANTING DATES ON THE MAIN PESTS INFESTING KIDNEY BEANS.

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ABSTRACT

Filed studies were carried out at Quesna, Menufyia governorate during two successive seasons 2009 and 2010 in summer plantation and late summer plantation. The highest average number of *Aphis craccivora* (koch.) in the two plantations during the two successive seasons was recorded on Gomi variety (96.14±19.16) followed by Paulista variety (93.44±19.79), while, the lowest average number was on Samantha variety (62.98±13.25). Nebraska variety had (68.36±13.18) nymphs/ 50 leaflets.

With respect to the white fly *Bemisia tabaci* (Genn.) the highest average number in the two plantations during the two successive seasons was recorded on Nebraska variety (33.70±7.37) followed by Gomi variety (30.22±7.27). On the other hand, the lowest average number, on Samantha variety (17.85±3.77) Paulista variety had (20.26±3.78 ind. / 50 leaflets).

Regarding to the potato leafhopper *Empoasca discipiens* Poali, the highest average number of the two plantations during the two successive seasons was recorded on Nebraska variety (36.06±15.41) followed by Gomi variety (33.75±14.80) and Samantha variety (31.51±14.43). While, the lowest average number was found on Paulista variety (25.32±11.63). On the other hand, Cerdon variety harboured (26.62±11.67) and Giza 6 variety (27.92±12.17 nymphs / 50 leaflets).

Results showed that the highest average number of *Liriomyza trifolii* (Burgess) was recorded on Cerdon variety (43.33±18.17) followed by Nebraska variety (40.45±17.70). While, the lowest average number was recorded on Gomi variety (28.60±11.70). Giza6 variety sheltered (29.96±12.26 larvae /50 leaflets).

The results indicated that the highest average number of *Tetranychus urticae* (Koch.) in the two plantations during the two successive seasons 2009 and 2010 was recorded on Gomi variety (21.44±4.81) followed by Paulista variety (17.78±2.79) and Nebraska variety (16.56±2.82); Cerdon variety (15.77±2.55) and Giza 6 variety (14.45±1.96). While Samantha variety harboured the lowest number (12.19±2.71) individuals of *T. urticae* during the two seasons of study.

Statistical analysis revealed that there are significant difference ($p < 0.01$) between the different kidney bean varieties during seasons and plantations according to the average number of the tested pests, *A. craccivora*, *B. tabaci*, *E. discipiens*, *L. trifolii* and *T. urticae*.

Results showed that late summer plantation of kidney bean during the two successive seasons 2009 and 2010 showed the highest average number of the aphids *A. craccivora* (106.25±5.21 and 115.13±10.02 nymphs/50 leaflets) and the serpentine leaf miner *L. trifolii* (23.86±2.26 and 78.40±5.68 larvae/50 leaflet), respectively. On the other hand, summer plantation of kidney bean during the two seasons sheltered the highest average number of the white fly *B. tabaci* (29.01±2.34 and 38.00±4.63 ind./ 50 leaflets) and potato leafhopper *E. discipiens* (46.57±2.21 and 59.07±3.72 nymphs/50 leaflets), respectively. Moreover, the red spider mite *T. urticae* reached the highest average number in late summer plantation during season 2009 which represented by 23.05±2.83 ind. /50 leaflets.

INTRODUCTION

Leguminous vegetable plants are very important in all agricultural regime, which used important as food in many countries of the world. Kidney bean (*Phaseolus vulgaris* L.) is considered one of the most important leguminous vegetable crops in Egypt. It has a great economic importance because of its local and global trading (Sandsted, 1980, Karl and Maghogho, 1985 and Omar and Faris, 2000).

In Egypt, kidney bean usually infested by different pests that cause considerable damage in both quantity and quality of the pods. The considerable insects that attack this crop are leafminer, white fly, aphid, leafhopper and tetranychid mite (Awadalla *et al.*, 1991; Abd El-Gawwad, 2004; Abbassy *et al.*, 2008 and Abd- Allah, 2010).

The leafminer, *Liriomyza trifolii* is considered a very important insect pest, which cause several infestations on the leaves as yellowish and dryness of leaves leading to the weakness of metabolism and consequently lack in crop. The white fly, *Bemisia tabaci*, the leafhopper *Empoasca discipiens* and aphid, *Aphis craccivora* are also, considered main insect pests infesting common bean and cause serious damage to the plant and yield (Shalaby, 2004 ; Shaalan, 2005 and Abd-Allah, 2010).

The kidney beans varieties exhibited different susceptibility to the different pests infestation, so the resistance varieties could be used as an item in integrated pest management programs (Kropczynska and Tomczyk, 1986; Wahba *et al.*, 1986; Faris *et al.*, 1991; Abbassy *et al.*, 2008 and Abd-Allah, 2010).

On the other hand, the influence of planting dates on the population density and infestation of the major pests attacking kidney beans could be also used as an item in integrated pest management programs (Abbassy *et al.*, 2008 and Saleh, 2011).

Thus, the aim of the present work is to study the influence of different varieties of kidney beans on the main pasts infesting the plants as well as the influence of planting dates on the occurrence of these pests during two successive seasons 2009 and 2010, to serve these studies as a basis for using in integrated pest management programs.

MATERIALS AND METHODS

The experiments were carried out at Quesna, Minufyia Governorate during the two successive seasons 2009 and 2010 in two plantations, each season in summer and late summer plantation. Seeds were sown in rows at the late of 12 rows 12 poles, the distance between the hills was 10 Cm apart on one side of the ridge.

These experiments were carried out in an area of about 1200 m². The area was divided into 24 replicates (each replicate was about 50 m²). Seeds of each variety were sown in four replicates in March 10th (2009 and 2010) for summer plantation and October 20th (2009 and 2010) for late summer plantation. The common bean varieties were Cerdon, Gomi, Giza 6, Paulista, Nebraska and Samantha.

Normal agricultural practices were applied except using any pesticides treatment. Sampling started after about two weeks from planting and prolonged to harvest time.

Each sample comprised 50 leaflets picked at random representing the plant levels from each replicate. Samples were put in plastic bags and transferred to the laboratory in the same day for examination and counting the immature stages of *B. tabaci* (immature stages), *A. craccivora* (nymphs and adults), *E. discipiens* (nymphs) and *L. trifolii* (larvae) as well as *T. urticae* by aid of stereoscopic-microscope.

The statistical analysis (ANOVA and simple correlation) of the obtained data were performed by using SAS program (SAS Institute, 1988) which run under WIN. In addition, the difference between means was conducted by using Duncan's multiple range test in this program.

RESULTS AND DISCUSSION

A- Influence of different varieties of kidney beans on the average number of the main pests.

1- Aphids (*A. craccivora*):-

Data illustrated in table (1) showed that the highest average number of *A. craccivora* during summer plantation 2009, which represented by 69.83±17.85 and 67.25±31.94 nymphs/50 leaflets, was recorded on Gomi and Paulista varieties, respectively, while the lowest average number 42.43±10.38 and 45.75±14.00 nymphs/50 leaflets was on Nebraska and Samantha varieties, respectively. In late summer plantation 2009, the highest average number 120.83±141.1 and 118.17±18.5 nymphs /50 leaflet was observed on Gomi and Paulista varieties, respectively, while the lowest average number 90.75±15.49 and 92.17±16.72 nymphs /50 leaflets were observed on Samantha and Nebraska varieties , respectively (Table: 1).

Table (1): Influence of different varieties on the average numbers of Aphids (*A. craccivora*) on kidney bean plants during seasons 2009 and 2010.

Varieties	Season 2009		Season 2010		Average ± SE
	Summer	Late Summer	Summer	Late Summer	
Cerdon	46.42±14.50 b	104.92±27.1 ab	48.67±14.39 ab	115.25±17.0 b	78.82±18.18
Gomi	69.83±17.85 a	120.83±14.1 a	57.58±34.43 a	136.33±20.0 a	96.14±19.16
Giza 6	56.17±16.53 ab	110.67±24.1 a	48.75±14.98 ab	133.17±17.2 a	87.19±20.63
Paulista	67.25±31.94 a	118.17±18.5 a	52.92±16.54 a	135.42±21.9 a	93.44±19.79
Nebraska	45.75±14.00 b	92.17±16.72 b	45.33±7.56 ab	90.17±14.58 b	68.36±13.18
Samantha	42.43±10.38 b	90.75±15.49 b	38.33±9.59b	80.42±16.48 b	62.98±13.25

Values labeled with the same letters in a column are not significantly different at the 1% level of probability (One way ANOVA).

During the second season 2010, in summer plantation the highest average number 57.58±34.43 nymphs /50 leaflets was recorded on Gomi

variety and the lowest average number 38.33±9.59 nymphs /50 leaflets on Samantha variety. Meanwhile, in late summer plantation, the highest average number 139.33±20.0 and 135.42 ±21.9 nymphs /50 leaflets was found on Gomi Paulista varieties, respectively, while the lowest average number 80.42±16.48 nymphs /50 leaflets was on Samantha variety.

As a conclusion, the highest average number of *A. craccivora* in the two plantations during the two successive seasons was recorded on Gomi variety (96.14±19.16) followed by Paulista variety (93.44±19.79), Giza 6 variety (87.19 ±20.63). The lowest average number of aphid nymphs was found on Samantha variety (62.98±13.25 nymphs/ 50 leaflets). Statistical analysis revealed that there are significant differences ($p<0.01$) between different kidney bean varieties during seasons and plantations in relation to the average number of *A. craccivora*. These results are in agreement with those obtained by Hegab, 2008, who reported that highly significant differences were estimated between the mean numbers of aphids infested different tested varieties of faba bean plants.

2- The white fly (*B. tabaci*):-

Data presented in table (2) showed that variety Nebraska was infested by the highest average number of *B. tabaci* during summer plantation 2009 which represented by 38.33±8.78 ind./50 leaflets, while the lowest average number 21.58±7.57 ind./50 leaflets was on Samantha variety. In late summer plantation 2009, the highest average number 18.83±4.40 ind./50 leaflets was on Nebraska variety. The lowest average number 8.25±2.59 ind./50 leaflets was observed on Samantha variety (table: 2).

Table (2): Influence of different varieties on the average numbers of white fly (*B. tabaci*) on kidney bean plants during seasons 2009 and 2010.

Varieties	Season 2009		Season 2010		Average ± SE
	Summer	Late Summer	Summer	Late Summer	
Cerdon	27.92±4.39 b	13.00±3.63 ab	32.08±5.32 b	17.33±1.30 ab	22.58±4.45
Gomi	32.08±8.51 ab	14.92±4.36 ab	49.33±10.94 ab	24.58±5.02 a	30.22±7.27
Giza 6	28.42±4.41 b	13.17± 3.75 ab	41.42±8.89 a	17.40±1.77 ab	25.10±6.32
Paulista	25.75±5.00 b	11.50±3.25 ab	27.33±5.59 bc	16.45±1.22 b	20.26±3.78
Nebraska	38.33±8.78 a	18.83±4.40 a	52.17±9.42 a	25.45±4.87 a	33.70±7.37
Samantha	21.58±7.57 b	8.25±2.59 b	25.64±6.07 c	15.92±1.01 b	17.85±3.77

Values labeled with the same letters in a column are not significantly different at the 1% level of probability (One way ANOVA).

During the second season 2010, in summer plantation the highest average number 52.17±9.42 and 49.33±10.94 ind./50 leaflets was noticed on Nebraska and Gomi varieties, respectively. In addition, the lowest average number was 25.64±6.07 followed by 27.33±5.59 ind. /50leaflets on Samantha and Paulista varieties, respectively. Meanwhile, in late summer plantation, the highest average number was recorded on Nebraska and Gomi varieties and represented by 25.45±4.87 and 24.58±5.02 ind. /50leaflets, while, the lowest average number occurred on Samantha (15.92±1.01) followed by Paulista variety (16.45±1.22 ind./50leaflets)Table 2.

As a conclusion, the highest average number of *B. tabaci* in the two plantations during the two successive seasons was recorded on Nebraska variety (33.70±7.37) followed by Gomi variety (30.22±7.27) and Giza 6 variety (25.10±6.32). Moreover, the lowest average number was on Samantha variety (17.85±3.77). Paulista variety (20.26±3.78) and Cerdon variety (22.58±4.45 ind./50 leaflets) harboured slightly higher population. Statistical analysis revealed that there are significant differences ($p < 0.01$) between different Kidney bean varieties during seasons and plantations in relation to the average number of *B. tabaci*. The recent results agree with those obtained by Hegab, 2008 on faba bean varieties and El-Samahy and Saad, 2010 on soybean varieties.

3- The potato leafhopper (*E. discipiens*):-

As shown in table (3), variety Nebraska had the highest average number of *E. discipiens* during summer plantation 2009 which represented by 55.83±13.03 nymphs/50 leaflets. While the lowest average number was recorded on Paulista variety followed by Cerdon variety and represented by 40.83±8.10 and 42.58±13.50 nymphs/50 leaflets, respectively. In late summer plantation 2009, the highest average number on Nebraska and Gomi varieties was by 8.33±1.31 and 7.27±1.46 nymphs/50 leaflets, respectively (table 3). While the lowest average number was recorded on Paulista and cerdon, which represented by 4.45±0.83 and 5.73±1.18 nymphs/50 leaflets, respectively.

During the second season 2010, in summer plantation, the highest average number on Nebraska and Gomi varieties which reached 68.83±13.01 and 67.58±12.29 nymphs/50 leaflets, respectively and the lowest average number was on Paulista and Cerdon varieties 49.42±8.08 and 50.67±9.08 nymphs/50 leaflets, respectively.

Table (3): Influence of different varieties on the average numbers of potato leafhopper (*E. discipiens*) on kidney bean plants bean during seasons 2009 and 2010.

Varieties	Season 2009		Season 2010		Average ± SE
	Summer	Late Summer	Summer	Late Summer	
Cerdon	42.58±13.50 ab	5.73±1.18 ab	50.67±9.08 a	7.50±1.20 ab	26.62±11.67
Gomi	49.50±8.93 ab	7.27±1.46 ab	67.58±12.29 a	10.64±2.25 ab	33.75±14.80
Giza 6	45.17±9.01 ab	6.09±1.05 ab	52.50±9.94 a	7.92±1.37 ab	27.92±12.17
Paulista	40.83±8.10 b	4.45±0.83 b	49.42±8.08 a	6.20±1.09 b	25.23±11.63
Nebraska	55.83± 13.03 a	8.33±1.31 a	68.83±13.01 a	11.25±1.61 a	36.06±15.41
Samantha	45.50±8.68 ab	6.27±1.19 ab	65.42±14.66 a	8.83±1.38 ab	31.51±14.43

Values labeled with the same letters in a column are not significantly different at the 1% level of probability (One way ANOVA).

Meanwhile, in late summer plantation, the highest average number were 11.25±1.61 and 10.64±2.25 nymphs/ 50 leaflets on Nebraska and Gomi varieties, respectively, while the lowest average number 6.20±1.09 and 7.50±1.20 nymphs/50 leaflets were recorded on Paulista and Cerdon varieties, respectively.

As a conclusion, the highest average number of the potato leafhopper *E. discipiens* in the two plantations during the two successive seasons was recorded on Nebraska variety (36.06±15.41) followed by Gomi variety (33.75±14.80) and Samantha variety (31.51±14.43). Moreover, the lowest average number on Paulista variety was (25.32±11.63) followed by Cerdon variety (26.62±11.67) and Giza 6 variety (27.92±12.17 nymphs /50 leaflets). Statistical analysis revealed that there are significant differences (p<0.01) between different common bean varieties during seasons and plantations in relation to the average number of *E. discipiens*. These are in agreement with those obtained by Hegab, 2008 who reported that the statistical analysis showed a highly significant differences between the mean number of the leafhopper on different faba bean varieties.

4- The serpentine leaf miner (*L. trifolii*):-

The obtained data in table (4) indicated that Cerdon and Nebraska varieties harboured the highest average number of *L. trifolii* during summer plantation 2009, which represented by 20.25±1.37 and 19.50±2.41 larvae/50leaflets, respectively, while the lowest average number was 14.33±0.98 and 16.00±0.91 larvae/50leaflets on Gomi and Gize6 varieties, respectively. In late summer plantation 2009, the highest average number was 33.3±6.08 larvae /50leaflet recorded on Cerdon variety (Table 4), while the lowest average number was on Gomi and Giza 6, which represented by 18.92±3.30 and 19.33±2.36 larvae/50leaflets, respectively. During the second season 2010, in summer plantation, the highest average number was on Cerdon and Nebraska which represented by 22.58±1.49 and 22.00±2.20 larvae/50leaflets, respectively and the lowest average number 17.58±1.22 and 17.83±1.30 larvae/50 leaflets was recorded on Gomi and Giza 6 varieties, respectively. Meanwhile, in late summer plantation, the highest average number 97.17±4.30 and 93.42±26.41 larvae/50leaflets was on Cerdon and Nebraska varieties, respectively. The lowest average number 63.58±1.56 and 66.67±2.31 larvae /50leaflets which recorded on Gomi and Giza 6 varieties, respectively.

Table (4): Influence of different varieties on the average numbers of leaf miner (*L. trifolii*) on kidney bean plants during seasons 2009 and 2010.

Varieties	Season 2009		Season 2010		Average ± SE
	Summer	Late Summer	Summer	Late Summer	
Cerdon	20.25±1.37 a	33.33±6.08 a	22.58±1.49 a	97.17±4.30 a	43.33±18.17
Gomi	14.33±0.98 c	18.92±3.30 b	17.58±1.22 b	63.58±1.56 a	28.60±11.70
Giza 6	16.00±0.91 bc	19.33±2.36 b	17.83±1.30 b	66.67±2.31 a	29.96±12.26
Paulista	17.67±1.03 abc	22.92±3.36 ab	19.30±1.43 ab	76.58±3.57 a	34.12±14.20
Nebraska	19.50±2.41 ab	27.25±6.07 a	22.00±2.20 ab	93.42±26.41 a	40.45±17.70
Samantha	16.09±1.68 abc	21.42±4.06 ab	18.18±1.80 ab	73.00±3.06 a	32.17±13.65

Values labeled with the same letters in a column are not significantly different at the 1% level of probability (One way ANOVA).

As a conclusion, the highest average number of *L. trifolii* was recorded on Cerdon variety (43.33±18.17) followed by Nebraska variety (40.45±17.70) and Paulista variety (34.12±14.20). Moreover, the lowest

average number was recorded on Gomi variety (28.60±11.70) followed by Giza6 variety (29.96±12.26) and Samantha variety (32.17±13.65 larvae/50 leaflets). Statistical analysis revealed that there are significant differences ($p < 0.01$) between different kidney bean varieties during seasons and plantations in relation to the average number of the serepentine leafminer (*L. trifolii*). These results are in agreement with those obtained by Abou-Attia and Youssef, 2007 who reported that soybean Giza 82 variety was the most resistant variety to infestation by *L. trifolii*.

5- The red spider mite (*T. urticae*):-

Data presented in table (5) showed that variety Gomi was recorded the highest average number of *T. urticae* during summer plantation 2009 which represented by 33.58±7.61 ind./50leaflets, while the lowest average numbers were 17.00±4.28 and 18.42±4.23 ind./50leaflets on Samantha and Giza 6 varieties, Respectively. In late summer plantation 2009, the highest average numbers were recorded on Gomi and Paulista varieties and represented by 13.00±2.72 and 12.58±2.39 ind. /50 leaflets, respectively. The lowest average number of *T. urticae* was recorded on Samantha which represented by 7.18±1.35 ind. /50 leaflets.

Table (5): Influence of different varieties on the average numbers of the red spider mite (*T. urticae*) on kidney bean plants during seasons 2009 and 2010.

Varieties	Season 2009		Season 2010		Average ± SE
	Summer	Late Summer	Summer	Late Summer	
Cerdon	22.17±5.15 ab	11.83±1.07 ab	17.58±4.57 a	11.50±2.10 ab	15.77±2.55
Gomi	33.58±7.61 a	13.00±2.72 a	24.67±5.34 a	14.50±2.43 a	21.44±4.81
Giza 6	18.42±4.23 b	11.00±1.68 ab	17.42±4.09 a	11.33±2.02 ab	14.54±1.96
Paulista	23.80±4.57 ab	12.58±2.39 ab	21.25±4.40 a	13.50±1.31 a	17.78±2.79
Nebraska	23.33±5.07 ab	12.00±2.04 ab	19.09±4.29 a	11.83±1.93 ab	16.56±2.82
Samantha	17.00±4.28 b	7.18±1.35 b	16.75±4.25 a	7.82±1.49 b	12.19±2.71

Values labeled with the same letters in a column are not significantly different at the 1% level of probability (One way ANOVA).

During the second season 2010, in summer plantation the highest average number was recorded on Gomi and Plausita varieties and which represented by 24.67±5.34 and 21.25±4.40 ind./50leaflets, Respectively and the lowest average number was 16.75±4.25 and 17.42 ±4.09 ± on Samantha and Giza 6, respectively. Meanwhile, in late summer plantation, the highest average number were 14.50±2.43 and 13.50±1.31 ind./50 leaflets on Gomi and Plausita varieties, respectively, while the lowest average number was 7.83±1.49 ind. /50 leaflets on Samantha variety.

As a conclusion, the highest average number of *T. urticae* in the two plantations during the two successive seasons 2009 and 2010 was recorded on Gomi variety (21.44±4.81) followed by Paulista variety (17.78±2.79) and Nebraska variety (16.56±2.82). Moreover, the lowest average number was Samantha variety (12.19±2.71) followed by Giza 6 variety (14.54±1.96) and Cerdon variety (15.77 ±2.55) ind. /50 leaflets. Statistical analysis indicated that there are significant differences ($p < 0.01$) between different kidney bean

varieties during seasons and plantations in relation to the average number of *T. urticae*. These results are in agreement with those obtained by Abd-Allah, 2010 who reported that Giza 6 variety was the least in feeding suitability to *T. urticae* and Paulista variety came in the intermediate position between Bronco and Giza varieties to infestation with *T. urticae*.

B- Influence of planting dates (plantations) of kidney beans on the average numbers of the main pests:

1- Aphids (*A. craccivora*):-

Data illustrated in fig. (1) showed that the average number of *A. craccivora* in the two plantations during the two successive seasons 2009 and 2010. The highest average number of *A. craccivora* was recorded in late summer plantation 2010 and represented by 115.13 ± 10.02 nymphs/ 50 leaflets followed by late summer plantation 2009 (106.25 ± 5.21), summer plantation 2009 (54.64 ± 4.79) and the lowest average number was found in summer plantation 2010 (48.60 ± 2.68 nymphs/50 leaflets).

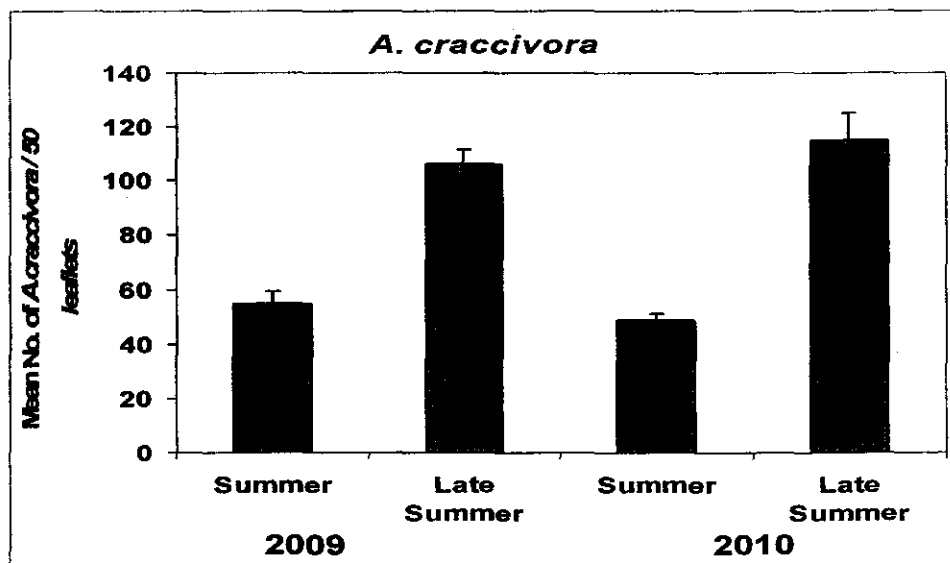


Fig.(1): The average number of *A. craccivora* infesting kidney bean plants affected by planting dates during the two successive seasons 2009 and 2010.

2- The white fly (*B. tabaci*):-

The obtained data in fig. (2) showed the average number of *B. tabaci* in the two plantations during the two successive seasons 2009 and 2010. The highest average number of *B. tabaci* was recorded in summer plantation 2010 and represented by 38.00 ± 4.63 ind. / 50 leaflets followed by summer plantation 2009 (29.01 ± 2.34), late summer plantation 2010 (19.52 ± 1.76) and the lowest average number was recorded in late summer plantation 2009 (13.28 ± 1.44 ind./50 leaflets).

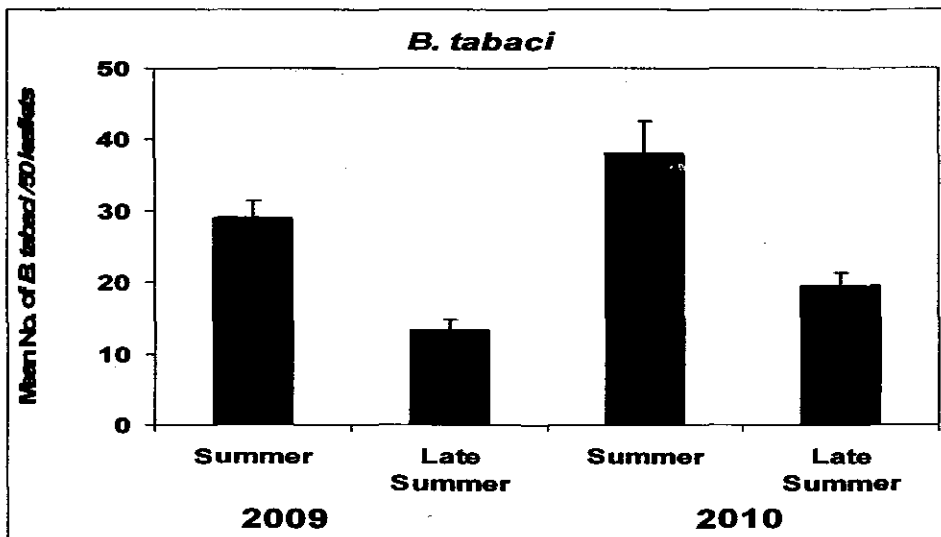


Fig.(2): The average number of *B. tabaci* infesting kidney bean plants affected by planting dates during the two successive seasons 2009 and 2010.

3- The potato leafhopper (*E. discipiens*):-

As shown in fig. (3), the average number of *E. discipiens* in the two plantations during the two successive seasons 2009 and 2010 was the highest in summer plantation 2010 and represented by (59.07±3.72 nymphs/ 50 leaflets) followed by summer plantation 2009(46.57±2.21), late summer plantation 2010 (8.72±0.79) and the lowest average number was recorded in late summer plantation 2009(6.36±0.54 nymphs/50 leaflets).

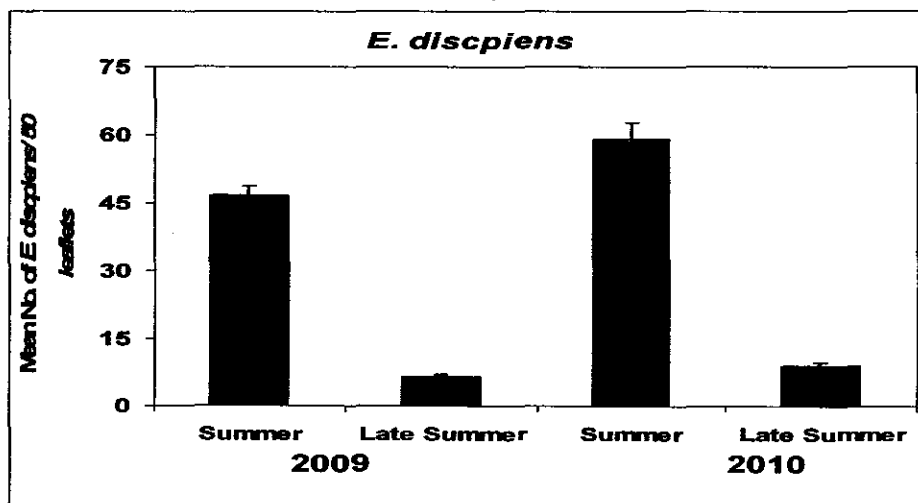


Fig.(3): The average number of *E. discipiens* infesting kidney bean plants affected by planting dates during the two successive seasons 2009 and 2010.

4- The serpentine leaf miner (*L. trifolii*):-

Data presented in fig. (4) showed that the highest average number of *L. trifolii* was recorded in late summer plantation 2010 and represented by (78.40±5.68 larvae/ 50 leaflets) followed by late summer 2009 (23.86±2.26), summer 2010 (19.58±0.89) and the lowest average number was recorded in late summer plantation 2009(17.31±0.92 larvae/50 leaflets).

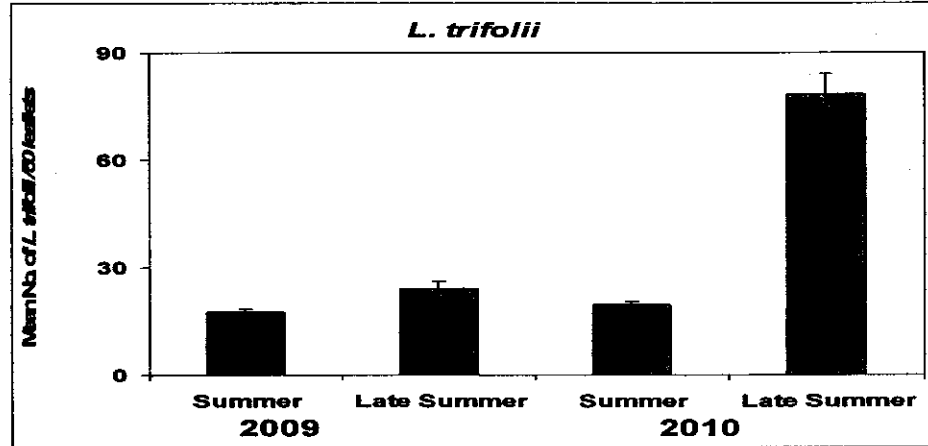


Fig.(4): The average number of *L. trifolii* infesting kidney bean plants affected by planting dates during the two successive seasons 2009 and 2010.

5- The red spider mite (*T. urticae*):-

Obtained data in fig. (5) showed that the highest average number of *T. urticae* was recorded in late summer 2010 and represented by (23.05±2.38 ind./50 leaflets), followed by late summer 2009 (19.46±1.23), summer 2010 (11.75±0.94) and the lowest average number was recorded in summer plantation 2009 (11.27±0.86 ind. /50 leaflets).

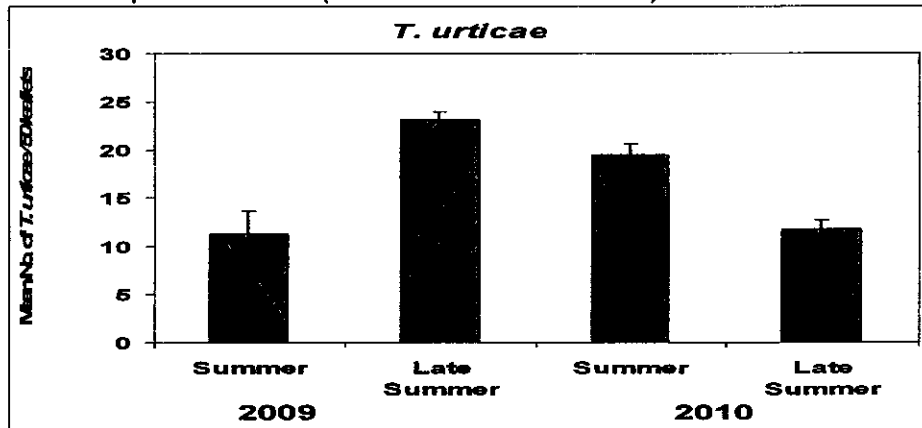


Fig.(5): The average number of *T. urticae* infesting kidney bean plants affected by planting dates during the two successive seasons 2009 and 2010.

As a conclusion, late summer plantation of kidney bean plants during the two successive seasons 2009 and 2010 showed the highest average number of the aphids *A. craccivora* (106.25 ± 5.21 and 115.13 ± 10.02 nymphs/50 leaflets) and the serpentine leaf miner *L. trifolii* (23.86 ± 2.26 and 78.40 ± 5.68 larvae/50 leaflet), respectively. On the other hand, summer plantation of kidney bean during the two seasons recorded the highest average number of the white fly *B. tabaci* (29.01 ± 2.34 and 38.00 ± 4.63 ind./50 leaflets) and potato leafhopper *E. discipiens* (46.57 ± 2.21 and 59.07 ± 3.72 nymphs/50 leaflets), respectively. Moreover, the red spider mite *T. urticae* recorded the highest average number in late summer plantation during season 2009 which represented by 23.05 ± 2.83 ind./50 leaflets. These results are in agreement with those obtained by Abbassy *et al*, 2008 whom they reported that planting dates of common bean significantly affected *L. trifolii* larval population.

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تأثير الأصناف المختلفة من الفاصوليا وكذلك مواعيد الزراعة المختلفة على الأفات الرئيسية التي تصيب المحصول.

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أجريت هذه الدراسات الحقلية بمركز قويسنا - محافظة المنوفية - خلال موسمين متتاليين ٢٠٠٩ و ٢٠١٠ وذلك في العروة الصيفية و العروة الصيفية المتأخرة.

وجد أن أعلى متوسط لمن البقوليات في العروتين خلال الموسمين المتتاليين سجل على الصنف جومى بمتوسط (٩٦.١٤±١٩.١٦) و يليه الصنف بوليسا بمتوسط (٩٣.٤٤±٧٩.١٩ حورية / ٥٠ وريقة). بينما سجل أقل متوسط لتعداد المن على الصنف سامنتا بمتوسط (٦٢.٩٨±١٣.٢٥) يليه الصنف نيراسكا بمتوسط (٦٨.٣٦±١٣.١٨ حورية / ٥٠ وريقة).

أما بالنسبة للذبابة البيضاء فسجل أعلى متوسط للتعداد في العروتين خلال الموسمين على الصنف نيراسكا بمتوسط (٣٣.٧٠±٧.٣٧) يليه الصنف جومى بمتوسط (٣٠.٢٢±٧.٢٧ فرد / ٥٠ وريقة). بينما سجل أقل متوسط للتعداد على الصنف سامنتا بمتوسط (١٧.٨٥±٣.٧٧) يليه الصنف بوليسا بمتوسط (٢٠.٢٦±٣.٧٨ فرد / ٥٠ وريقة).

ولكن نطاط أوراق البطاطس سجل أعلى متوسط للتعداد له في العروتين خلال الموسمين على الصنف نبراسكا بمتوسط (15.41±36.06) يليه الصنف جومي بمتوسط (14.80±33.75) حورية / 50 وريقة) ثم الصنف سامنتا بمتوسط (14.43±31.01). بينما سجل أقل متوسط للتعداد على الصنف بوليستا بمتوسط (11.63±25.32) ثم الصنف سيردون بمتوسط (11.67±26.62) ثم الصنف جيزة 6 بمتوسط (12.17±27.92) حورية / 50 وريقة). و أظهرت نتائج التحليل الاحصائي أن هناك فروق معنوية بين الأصناف و مواعيد الزراعة المختلفة على متوسط تعداد أوراق البطاطس.

أما بالنسبة لصناعة أنفاق أوراق الفول فوجد أن أعلى متوسط للتعداد لها في العروتين خلال الموسمين سجل على الصنف سيردون بمتوسط (18.17±43.33) يليه الصنف نبراسكا بمتوسط (17.70±40.45) وريقة / 50 وريقة). بينما سجل أقل متوسط للتعداد على الصنف جومي بمتوسط (11.70±28.60) يليه الصنف جيزة 6 بمتوسط (2.26±29.96) وريقة / 50 وريقة). و أخيرا بالنسبة للعنكبوت الاحمر فقد سجل أعلى متوسط للتعداد له في العروتين خلال الموسمين على الصنف جومي بمتوسط (4.81±21.44) يليه الصنف بوليستا بمتوسط (2.79±17.78) ثم الصنف نبراسكا بمتوسط (2.82±16.06) فرد / 50 وريقة). بينما سجل أقل متوسط للتعداد على الصنف سامنتا بمتوسط (2.71±12.19) يليه الصنف جيزة 6 بمتوسط (1.96±14.04) ثم للصنف سيردون بمتوسط (2.55±15.77) فرد / 50 وريقة).

وأظهرت نتائج التحليل الاحصائي أن هناك فروق عالية المعنوية بين الأصناف المختلفة للفاصوليا خلال الموسمين المتتاليين 2009 و 2010 و ذلك في العروتين الصيفية و الصيفية المتأخرة.

و قد أظهرت النتائج انه في العروة الصيفية المتأخرة لزراعة الفاصوليا خلال الموسمين 2009 و 2010 كان أعلى متوسط لتعداد من البقوليات (10.62±5.21 و 11.02±11.13 حورية/50 وريقة) وأيضا بالنسبة لصناعة أنفاق أوراق الفول (2.26±23.86 و 5.68±78.40 وريقة / 50 وريقة) على التوالي. وعلى الجانب الاخر فانه في العروة الصيفية لزراعة الفاصوليا خلال موسمي الدراسة سجل أعلى متوسط للتعداد على الذبابة البيضاء حيث كان (2.34±29.01 و 4.63±38.00 فرد/50 وريقة) كما كان لنطاط أوراق البطاطس (2.21±46.07 و 3.72±59.07 حورية / 50 وريقة) على التوالي. علاوة على ذلك فكان أعلى متوسط لتعداد العنكبوت الاحمر في العروة الصيفية المتأخرة خلال الموسم 2009 و قد سجل (2.38±23.05) فرد / 50 وريقة).

قام بتحكيم البحث

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