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Susceptibility of certain cantaloupe hybrids to major pests infestation in Sohag Governorate

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Abstract:

Cantaloupe (*Cucumis melo* var. cantalupensis, galia type) is an important cucurbitaceous vegetable crop sown in Egypt. The present study was conducted at Shandweel Agricultural Research Station, Sohag Governorate during two summer successive seasons of 2017 and 2018 to investigate the population density of the aphid**,** *Aphis gossypii* Glover (Hemiptera: Aphididae); the whitefly**,** *Bemisia tabaci* (Gennadius) (Hemiptera: Aleyrodidae); the spider mite, *Tetranychus urticae* (Koch) (Acari: Tetranychidae) and the leafminer**,** *Liriomyza trifolii* (Burgess) (Diptera: Agromyzidae) on cantaloupe crop and the susceptibility of ten local cantaloupe hybrids to infest by the previous pests, in addition to determine some yield characters. Also, the effect of hair density on the infestation with piercing sucking pests was studied. Data revealed significant differences between the tested hybrids in case of all pests and all horticultural characters during two successive seasons. It was evident that number of hairs on cantaloupe leaves had positive effect on the aphid and two spotted spider mite, and negative effect on whitefly**.** The present study can be suggest that the best hybrids are Shahd Zaman followed by Hybrid No. 8 and Hybrid No. 22, because of their high yield and their moderate infestation by most pests. This recommendation was built up on the data of two seasons under experimental conditions at Sohag Governorate .

Introduction

Cantaloupe (*Cucumis melo* var. cantalupensis, galia type) is one of the most important and popular fruity vegetable grown in Egypt. The cultivated area reached 69,000 feddan. Most the mentioned area is cultivated with imported seeds paid foreign hard currency. Improving of local cantaloupe hybrids with good fruit quality and high yield under high temperature at Sohag conditions is very important (El-Murabaa, 1971 and Shalaby, 1975). However, this vegetable is liable to attack by several pests, i.e., the aphid**,** *Aphis gossypii* Glover (Hemiptera: Aphididae); the whitefly**,** *Bemisia tabaci* (Gennadius) (Hemiptera: Aleyrodidae); the spider mite,

Tetranychus urticae (Koch) (Acari: Tetranychidae) and leafminer**,** *Liriomyza trifolii* (Burgess) (Diptera: Agromyzidae) that reduce its quality and quantity. (Ibrahim, 2005; Gameel, 2013 and Abdel-Rahman *et al*., 2016). To avoid the damage caused by previous pests and decrease using pesticides, the use of resistant hybrids is the ideal alternative as a component of Integrated Pest Management programs. Many authors searched the effect of plant resistance on the level of plant infestation. Boissot *et al.* (2003) identified the resistance in 80 C. melo genotypes for *B. tabaci* infestation. Metwally *et al.* (2013) studied the susceptibility of six cantaloupe cultivars to infestation by *B. tabaci* and *T. urticae*. Abdallah (2015) studied the control of *T. urticae* on three melon cultivars. De Oliveira *et al.* (2017) evaluated 54 accessions and four commercial hybrids of melon in regard to resistance to leafminer. The morphological features of the plant such as leave hairs and trichomes play important role on water control and resistance against herbivory in some plants (Cipollini and Bergelson, 2002; Molina-Montenegro *et al.*, 2006 and Gonzales *et al.*, 2008). The simple trichomes of these genotypes probably act as mechanical barriers that hinder insect movement and/or feeding (Le Roux *et al.*, 2008), also, chemical compounds in glandular trichomes can be deterrent or toxic to several herbivores (Buta *et al.*, 1993). So, the current study was mostly built up to select the best hybrids which gave high yield and most resistant to aphid, whitefly, spider mite and leafminer infestation as one of the control options to suppress heavy infestation in integrated pest management programs. Also, the population density and the effect of hair density on the infestation with the perivous pests was studied.

Materials and methods

The present study was conducted at Shandweel Agricultural Research Station, Sohag Governorate during two successive summer seasons of 2017 and 2018.

1.Population density:

To study the population density of the main pests attacking cantaloupe plants, an area of about 54 m^2 was divided into plots of equal size (18 m^2) and was sown with cantaloupe (Shahd Zaman) on March 30th in 2017 and 2018 seasons and three replicates were used. The normal agricultural practices were performed and no insecticides used.

2.Susceptibility of different cantaloupe hybrids to infestation of pests:

Ten cantaloupe hybrids namely, Super Quality, Yathreb 100, Hybrid No. 2, Hybrid SQ, Hybrid No. 100, Hybrid No. 22, Hybrid No. 7, Shahd Zaman, Hybrid No. 3 and Hybrid No. 8 were sown to study their susceptibility to infest by *A. gossypii*, *B. tabaci*, *T. urticae* and *L. trifolii* during summer seasons of 2017 and 2018. Seeds were sown on March 30th in randomized complete block with three replicates, each replicate contained 10 experimental plots. Each plot was presented by three beds, 1.5 m width, 4 m length (18 m^2) and the plants were spaced at 50 cm. Land preparation fertilizer application and other field practices were carried out according to recommendation of Egyptian Ministry of Agriculture and all plots were kept without any pesticidal treatments.

3.Collecting data:

3.1.Pests data:

Depending on timing of infestation, initiation of counts varied for each trial. One hour after the sunrise, adults of whitefly were counted weekly, on abexial surface of ten randomly leaves/ plot in the field. After that, samples of ten leaves/ plot were randomly chosen, then transferred in polyethylene bags to laboratory. The population of *B. tabaci*

(nymphs and eggs) and *T. urticae* (adults, nymphs and eggs) were estimated by counting numbers per two square inches. However, the total individuals of *A. gossypii* were determined by counting the total number per the whole underside leaf, also, the number of mines of *L. trifolii* was recorded.

3.2.Leave hair density:

To estimate leave hair density, 30 leaves were randomly taken from three plant levels (upper, middle and lower) from each plot, transferred to laboratory, then the number of hairs on the abaxial leave surface was counted in a 1 mm^2 area using a compound microscope during the second season.

3.3.Horticultural data:

3.3.1.Main stem length:

A random sample of ten plants from each plot was used for evaluating main stem length (cm, 60 days after sowing).

3.3.2.Flowering date:

Ten plants were chosen for every hybrid from each replicate and the number of days from sowing to anthesis of first female flower was determined.

3.3.3.Number of fruits per plant:

It measured as an average of fruits of 10 randomly chosen plants per plot.

3.3.4.Fruit weight:

A random sample of ten plants from each plot was used for evaluating average fruit weight (g).

3.3.5.Total yield:

It was weight of all fruits harvested at the yellow netted ripe stage from 10 randomly chosen plants per plot.

4.Statistical analysis:

Statistical analysis was conducted by using one – way analysis of variance. 'F' test used to evaluate the differences significance between haybrids and mean separation was conducted using the least significant difference (L.S.D.) procedure at P = 5% (Snedecor and Cochran, 1971). To determine the effect of leaf trichome density on the level of infestation by *A. gosypii*, *B. tabaci* and *T. urticai*, the simple correlation (r) was also used (Gomez and Gomez, 1984).

Results and discussion

1. Population density:

1.1. *Aphis gossypii*:

Data illustrated in Figure (1) demonstrated that the infestation of this aphid started after 15 days from sowing date in both seasons. Aphids population increased gradually to reach its peaks of 132.3 and 23.3 aphid/ 10 leaves in 13th May and 10th June, respectively, in 2017 season, however, one peak was recorded in 2018 season, in 6th May by 118,7 aphids / 10 leaves. After that the population decreased gradually to the end of the two seasons. These results are in agreement with those of Abou El-Saad (2015) and Ibrahim *et al*. (2017).

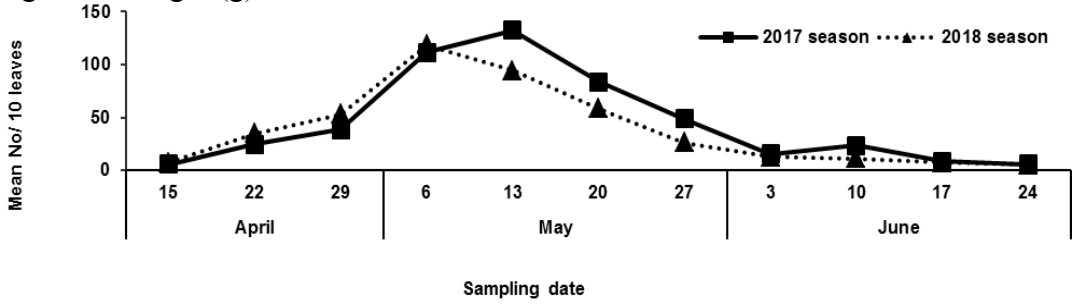

Figure (1): Population density of Aphis gossypii on cantaloupe crop in Sohag Governorate during 2017 and 2018 seasons.

1.2.*Bemisia tabaci*:

In general, the three stages of the whitefly , *B. tabaci* (adult, nymph and egg) started to take place from the first week of inspection in both seasons of the study (Figures, 2 and 3). Adults formed 2 and 3 peaks in 2017 and 2018 seasons, respectively. The peaks were 397.0 and

100.0 adults/ 10 leaves in 29th April and 27th May, respectively in 2017 season and 314.0, 340.0 and 220.3 adults/ 10 leaves in 22nd April and 6th and 27th May, respectively, in 2018 season. However, the nymphs recorded 4 peaks of activity in both seasons, in 22nd April, 13th and 27th May and 10th June with 262.3, 327.7, 267.7 and 365.3 nymphs/ 10 leaves, respectively, in 2017 season, and in 22nd April, 6th and 27th May and 10th June with 148.0, 300.7, 351.3 and 447.3 nymphs/ 10 leaves, respectively, in 2018 season. Meanwhile, two peaks were observed for egg stage during the two seasons. The peaks were recorded in 22nd April and 13th May with 260.7 and 157.3 eggs/ 10 leaves, respectively, in 2017 season and 240.0 and 158.7 eggs/ 10 leaves, respectively, in 2018 season. Then, the population decreased to the end of the two seasons. These findings are in partial agreement with the results of Metwally *et al.* (2013); Abou El-Saad (2015) and Hegab (2017).

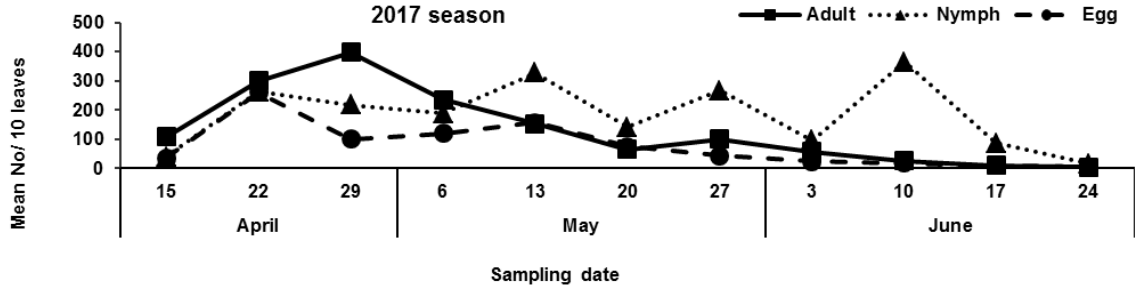

Figure (2): Population density of *Bemisia tabaci* adult, nymph and egg stages on cantaloupe crop in Sohag Governorate during 2017 season.

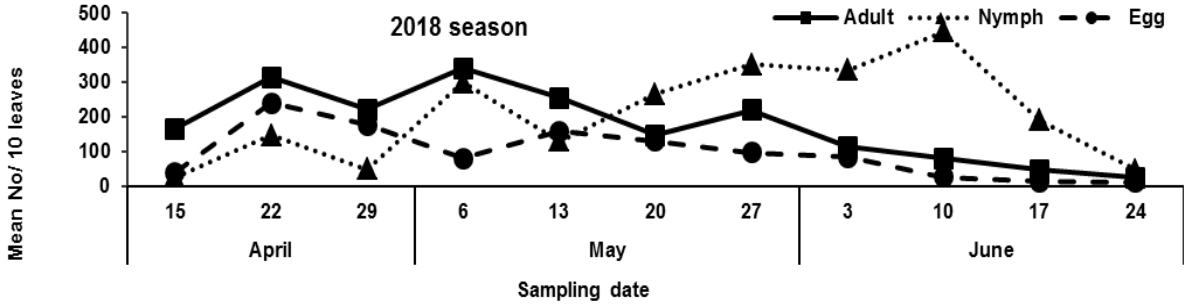

Figure (3): Population density of *Bemisia tabaci* adult, nymph and egg stages on cantaloupe crop in Sohag Governorate during 2018 season.

1.3.*Tetranychus urticae*:

Data in Figures (4 and 5) generally indicated that *T. urticae* (mobile and egg stages) started to take place from the first week of inspection in both seasons of the study. Two and three peaks of activity were found for mobile stages in 2017 and 2018 seasons, respectively. The peaks were recorded in 22nd April and 20th May with 72.3 and 31.7 individuals/ 10 leaves, respectively, in 2017 season. However, the mean numbers of 28.7, 38.3 and 29.7 individuals/ 10 leaves were recorded as peaks in 29th April, 20th May and 3rd June, respectively, in 2018 season. Then the population decreased to the end of the two seasons. On the other hand, egg stage number recorded two peaks in both seasons. The peaks were recorded in 6th and 20th May with 60.0 and 47.3 eggs/ 10 leaves, respectively, in 2017 season. While, in 2018 season, the peaks were observed in 6th May and 3rd June with 30.7 and 45.3 eggs/ 10 leaves, respectively. Then the population decreased to the end of the two seasons. The same results were obtained by Metwally *et al.* (2013); Aiad *et al.* (2014) and Abou El-Saad (2015).

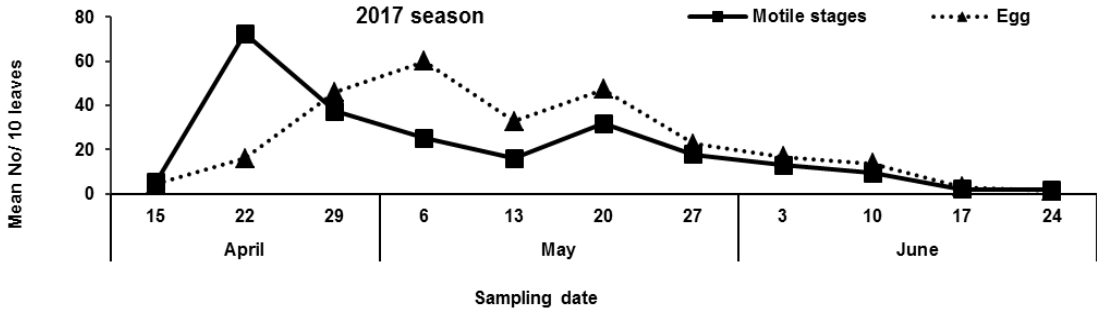

Figure (4): Population density of *Tetranychus urticae* mobile and egg stages on cantaloupe crop in Sohag Governorate during 2017 season.

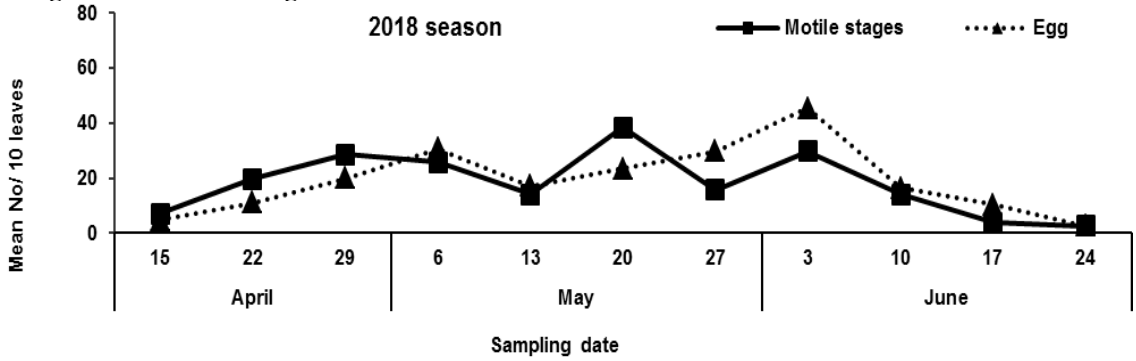

Figure (5): Population density of *Tetranychus urticae* mobile and egg stages on cantaloupe crop in Sohag Governorate during 2018 season.

1.3.*Lirimyza trifolii*:

Data illustrated in Figure (6) clearly indicated that the leafminer, *L. trifolii* population (determined as number of mines) attacked cantaloupe leaves from the first week of inspection. The number of mines peaked three and two times in 2017 and 2018 seasons, respectively. These peaks were observed at 6th and 20th May and 3rd June with 21.7, 18.7 and 21.7 mines/ 10 leaves, respectively, during the first season. While, in the second season, the mean numbers of 20.0 and 27.7 mines/ 10 leaves were detected as peaks in 29th April and 3rd June, respectively.

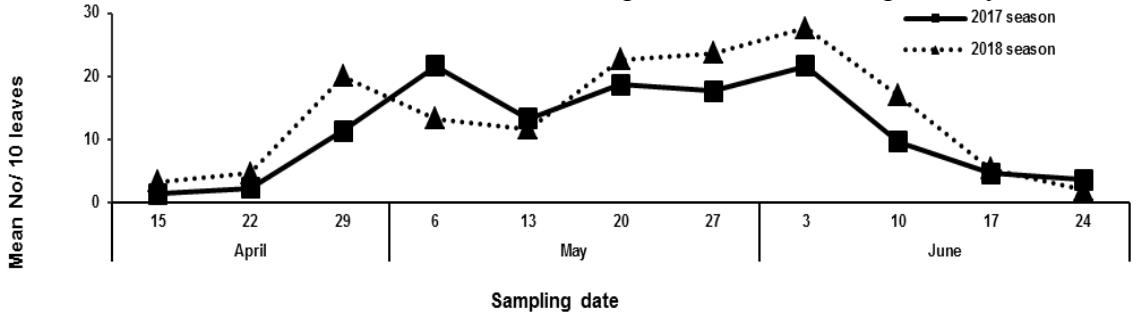

Figure (6): Population density of *Liriomyza trifolii* (Mines) on cantaloupe crop in Sohag Governorate during 2017 and 2018 seasons.

2.The susceptibility of ten cantaloupe hybrids to pests:

Data in Tables (1 and 2) showed that the mean numbers of aphid, whitefly (adult, nymph and egg), spider mite (mobile stages and egg) and leafminer (mines) populations on the ten tested cantaloupe hybrids in 2017 and 2018 seasons, respectively. Statistical analysis of data revealed significant differences between mean numbers of the previous pests populations on cantaloupe hybrids during two successive seasons.

2.1. *Aphis gossypii*:

According to the mean number of aphids, Hybrid SQ showed the lowest mean number of aphids with 22.76 aphids/ 10 leaves, while, the highest mean was observed in Yathreb 100 hybrid with 41.52 aphids/ 10 leaves followed insignificantly by Super Quality Hybrid in 2017 season. In 2018 growing season, the lowest and the highest mean number of aphid were recorded in Hybrid No. 22 and Yathreb 100 hybrid, respectively, with 16.61 and 39.58 aphids/ 10 leaves, respectively, with insignificant difference between the first one and Hybrid SQ. The other hybrids arranged between the lowest and the highest susceptible hybrids in both seasons of the study. The same results were obtained by Rashwan (2015) on melon and Hegab (2017) on cucumber.

2.2. *Bemisia tabaci*:

For adults, it is clear that, Super Quality was the most resistant hybrid to *B. tabaci* adult in both seasons, followed insignificantly by Hybrid No. 2 in 2017 season and Hybrid SQ in 2018 season. On the other hands, Shahd Zaman was the most infested hybrid in both seasons, followed insignificantly by Hybrid No. 22 and Hybrid No. 100 in the first season. In case of *B. tabaci* nymphs, Hybrid No. 7 was the lowest infested one in both seasons, followed insignificantly by Yathreb 100 in both seasons and Hybrid No. 8 in 2018 season. While, Hybrid No. 2 was found to be the most infested one in both seasons, followed insignificantly by Hybrid No. 100 in both seasons, and Hybrid SQ in 2018 season only. The lowest mean number of *B. tabaci* eggs was recorded in Shahd Zaman, followed insignificantly by Hybrid No. 7 and Yathreb 100 in 2017 season, and in Hybrid No. 7 in 2018 season. However, Hybrid No. 2 recorded the highest number in both seasons, with no significantly differences between the last and Hybrid No. 3 in both seasons and Hybrid No. 22 in the second season. Many authors had attention to whitefly resistance; Boissot *et al.* (2003) screened the resisitance in 80 *Cucumis melo* genotypes to *B. tabaci* adults and nymphs. They found that the studied genotypes differed significantly in order of adult and nymphs infestation. Also, Metwally *et al.* (2013) studied the susceptibility of six cantaloupe cultivars to *B. tabaci*.

2.3. *Tetranychus urticae*:

In the first season, Hybrids Super Quality, Hybrid No. 2 and Hybrid No. 8 were the lowest infested with mobile stages of *T. urticae*, however, Hybrid SQ was the highest infested. In the second season, Hybrid No. 8 was the lowest infested followed insignificantly by Hybrid No. 7, however, Hybrids Yathreb 100, Hybrid SQ and Hybrid No. 100 was the highest infested and the other hybrids arranged between the highest and the lowest. For *T. urticae* egg stage, data showed that the lowest mean number was observed in Hybrid No. 8 followed insignificantly by Hybrid Super Quality in both seasons. While, the highest mean number of egg was recorded in Hybrid SQ followed insignificantly by Hybrid Yathreb 100 in both seasons of the study. Similar findings were reported by Metwally *et al*. (2013), who mentioned that the six tested cantaloupe cultivar varied significantly in respect of *T. urticae* mobile stages. Also, Aiad *et al.* (2014) found that Galia2 and Ananas France were the highest and the lowest infested by *T. urticae*. In (2015), Abdallah concluded that cultivating the melon Shahd cultivar is preferable than Ananas or Galia cultivar.

2.4. *Lirimyza trifolii*:

It is clear that Hybrid No. 22 was the lowest infested in both seasons, followed insignificantly by Super Quality, Yathreb 100 and Hybrid SQ in the second season. On the other hand, the most susceptible hybrid was Shahd Zaman in both seasons. The susceptibility of rest arranged between

the lowest and the highest hybrids. Similar findings were obtained from De Oliveira *et al*. (2017) who found that the evaluated melon genotypes widely varied in regard to resistance to vegetable leafminer. They suggested that the lighter melon leaves are less oviposited by vegetable leafminer. Also, Celin *et al*. (2017) determined the resistance to leafminers in 52 melon accessions and 4 commercial hybrids as controls. They identified four resistant genotypes to leafminers, CNPH 11-1072 and CNPH 11-1077 (by antixenosis), and CNPH 00-915(R) and 'BAGMEL 56(R) (by antibiosis).

Table (1): Susceptibility of ten cantaloupe hybrids to infestation of pests in Sohag Governorate during 2017 season.

Hybrids	Mean No./ 10 leaves						
	Aphis gossypii	*Bemisia tabaci*			*Tetranychus urticae*		*Liriomyza trifolii*
		Adult	Nymph	Egg	Mobile	Egg	
Super Quality	39.06 **ab**	114.67 **e**	201.18 **cd**	101.52 **c**	15.09 **f**	18.06 **e**	5.36 **c**
Yathrib 100	41.52 **a**	136.42 **b**	147.61 **f**	83.52 **e**	25.30 **b**	34.24 **a**	5.58 **c**
Hybrid No. 2	34.70 **cd**	120.79 **de**	317.45 **a**	123.76 **a**	15.76 **f**	22.12 **cd**	5.58 **c**
Hybrid SQ	22.76 **g**	129.03 **bc**	298.27 **b**	104.91 **c**	27.73 **a**	35.00 **a**	5.27 **c**
Hybrid 100	31.70 **de**	151.24 **a**	301.76 **ab**	103.03 **c**	22.24 **c**	26.21 **b**	5.58 **c**
Hybrid No. 22	27.73 **f**	155.79 **a**	184.70 **e**	117.09 **b**	20.30 **d**	24.97 **bc**	4.55 **d**
Hybrid No. 7	29.58 **ef**	130.36 **b**	136.88 **f**	82.24 **e**	17.21 **e**	21.82 **d**	6.97 **b**
Shahd Zaman	37.48 **bc**	158.15 **a**	187.82 **de**	78.58 **e**	22.55 **c**	22.79 **cd**	10.36 **a**
Hybrid No. 3	29.58 **ef**	135.48 **b**	214.09 **c**	121.39 **ab**	20.21 **d**	23.27 **bcd**	7.15 **b**
Hybrid No. 8	32.52 **de**	122.55 **cd**	185.27 **de**	90.73 **d**	15.61 **f**	17.67 **e**	5.33 **c**
F. value	**28.51***	**36.38***	**143.37***	**67.37***	**153.33***	**34.66***	**51.15***
L.S.D.	**3.16**	**7.45**	**16.18**	**6.01**	**1.04**	**2.98**	**0.69**

Means followed by different subscript letters within columns are significantly different from each other (P < 0.05).

Table (2): Susceptibility of ten cantaloupe hybrids to infestation of pests in Sohag Governorate during 2018 season.

Hybrids	Mean No./ 10 leaves						
	Aphis gossypii	*Bemisia tabaci*			*Tetranychus urticae*		*Liriomyza trifolii*
		Adult	Nymph	Egg	Mobile	Egg	
Super Quality	31.33 **b**	119.33 **g**	221.76 **bc**	110.12 **c**	12.15 **bc**	13.18 **ef**	8.18 **cd**
Yathrib 100	39.58 **a**	132.21 **de**	158.42 **de**	95.12 **d**	17.58 **a**	28.94 **a**	8.30 **cd**
Hybrid No. 2	29.97 **bc**	128.39 **ef**	349.52 **a**	127.70 **a**	11.82 **bc**	17.30 **cd**	9.18 **bc**
Hybrid SQ	18.06 **ef**	116.52 **g**	309.88 **a**	107.82 **c**	17.58 **a**	30.88 **a**	8.27 **cd**
Hybrid 100	25.48 **cd**	163.73 **b**	320.61 **a**	112.70 **bc**	17.00 **a**	19.42 **bc**	8.97 **bc**
Hybrid No. 22	16.61 **f**	160.36 **b**	192.00 **cd**	120.21 **ab**	13.45 **b**	20.55 **b**	7.79 **d**
Hybrid No. 7	23.79 **de**	134.67 **cd**	140.67 **e**	80.91 **e**	10.67 **cd**	16.21 **de**	10.09 **b**
Shahd Zaman	31.52 **b**	169.33 **a**	192.42 **cd**	95.27 **d**	13.06 **b**	17.06 **cd**	12.18 **a**
Hybrid No. 3	26.88 **bcd**	138.94 **c**	237.73 **b**	125.09 **a**	13.58 **b**	18.67 **bcd**	10.03 **b**
Hybrid No. 8	29.15 **bcd**	126.79 **f**	143.79 **e**	96.42 **d**	9.61 **d**	12.09 **f**	9.15 **bc**
F. value	**12.21***	**137.28***	**25.03***	**28.43***	**15.88***	**33.30***	**11.27***
L.S.D.	**5.74**	**4.77**	**45.26**	**8.40**	**2.13**	**3.15**	**1.15**

Means followed by different subscript letters within columns are significantly different from each other (P < 0.05).

3. Hairs density:

Data in Table (3) showed the hair density on upper, middle and lower levels and mean of ten cantaloupe hybrids leaves during 2018 season. It is obvious that as age of the leaves increase, increase in the size of leaves and decreases the hair density. The analysis of data showed that the differences between the tested hybrids are significant at the three plant levels and their mean. The highest and density of hairs was found on leaves of Shahd Zaman in upper plant level, and on leaves of Yathreb 100 in middle and lower plant levels and mean number. However, the lowest density of hairs was found on leaves of Hybrid No. 3 in all plant levels and mean number. While the rest hybrids arranged between the highest and the lowest values. Data in Table (3) showed that the number of

hairs on cantaloupe leaves had weak, positive and insignificant effect on the aphid, *A. gossypii* population in all plant levels. Doryanizadeh *et al*. (2017) demonstrated that antixenosis of *Cucumis* correlated positively with leaf trichome density. On contrary, the relationship between the whitefly, *B. tabaci* and hair density was negative, varied according to the pest age and the plant level. The correlations between mean number of whitefly adult and nymph on side and hair density on the other side were found to be negatively weak and insignificant in all plant levels. Values of correlation coefficient between mean number of whitefly egg and number of hairs on upper plant level and mean of hairs were significantly and insignificantly negative, respectively (r= -0.7282* and -0.5420, respectively).

Concerning the influence of hair density on cantaloupe infestation with mite (Table, 3), the correlation coefficient values clear positive relationships, almost, varied according to the pest age and the plant level. Significantly positive correlation values was found between the numbers of mite mobile stages and hair density in middle and lower plant levels (r= 0.6329* and 0.6179*, respectively), while, insignificantly positive correlation value was recorded in upper plant level and mean (r= 0.2018 and 0.4892, respectively). For the effect of hair density on the number of mite egg, similar results were obtained. The correlation coefficient values, 0.2882, 0.7192*, 0.7690* and 0.6067 were recorded in upper, middle and lower plant levels and mean, respectively. Van Haren *et al*.(1987) stated that the leaf hairs and trichomes have an imprtant effect on searching ability of predator mite, *Phytoseiulus persimilis* Athias-Henriot (Acari: Phytoseiidae) on *T. urticae* on tomato. These findings are in harmony with Ibrahim *et al*. (2008) who revealed that the highest population of mite was recorded on Sudanian watermelon which has thick hairy leaves, whereas squash leaves which nearly hairless recorded the lowest population.

Table (3): Density of hairs on lower surface of ten cantaloupe hybrids leaves and their correlation with the pests in Sohag Governorate during 2018 season.

Hybrid		Mean No./ 1 mm^2/ 10 leaves			
		Upper level	Middle level	Lower level	Mean
Super Quality		248.89 **e**	101.44 **de**	22.89 **ef**	124.41 **de**
Yathreb 100		471.44 **abc**	336.67 **a**	235.78 **a**	347.96 **a**
Hybrid No. 2		280.78 **de**	200.67 **bc**	144.56 **b**	208.67 **cd**
Hybrid SQ		456.44 **bcd**	293.89 **ab**	170.56 **b**	306.96 **ab**
Hybrid No. 100		323.78 **cde**	192.11 **cd**	83.89 **c**	199.93 **cd**
Hybrid No. 22		177.57 **e**	99.89 **de**	52.44 **cde**	109.96 **e**
Hybrid No. 7		517.78 **ab**	144.78 **cd**	44.00 **def**	235.52 **bc**
Shahd Zaman		644.00 **a**	214.11 **bc**	46.33 **de**	301.48 **ab**
Hybrid No. 3		177.56 **e**	26.00 **e**	11.33 **f**	71.63 **e**
Hybrid No. 8		262.22 **e**	122.00 **cde**	63.33 **cd**	149.19 **cde**
F. value		**6.57***	**8.25***	**42.80***	**9.90***
L.S.D.		**182.47**	**97.32**	**33.00**	**87.57**
Correlation coefficient for					
Aphis gossypii		0.2476	0.2910	0.2926	0.3148
Bemisia tabaci	Adult	0.1668	-0.1128	-0.3084	-0.0243
	Nymph	-0.2129	0.1640	0.2268	-0.0057
	Egg	**-0.7282***	-0.3305	-0.0712	-0.5420
Tetranychus urticae	Motile stages	0.2018	**0.6329***	**0.6179***	0.4892
	Egg	0.2882	**0.7192****	**0.7690****	0.6067

Means followed by different subscript letters within columns are significantly different from each other (P < 0.05).

4. Horticultural data:

The mean numbers of main stem length and some yield component recorded in ten local cantaloupe hybrids are presented in Tables (4 and 5). In general, the data in previous Tables indicated that the tested local cantaloupe hybrids differed significantly for all studied characters in both seasons.

4.1.Main stem length:

The highest main stem length was recorded in Shahd Zaman in both seasons, respectively. However, the lower values were recorded in Hybrid No. 3 and Super Quality in both seasons, respectively, with insignificant difference between them. The rest hybrids arranged between the highest and the lowest values.

4.2.Flowering date:

The tested hybrids can be arranged in two significant groups, the earliest one contained Yathreb 100, Hybrid No. 2, Hybrid SQ, Hybrid No.100 and Hybrid No. 7, however, the latest one consisted of Super Quality, Hybrid No. 22, Shahd Zaman, Hybrid No. 3 and Hybrid No. 8 in the two seasons.

4.3.Number of fruits per plant:

The highest number of fruits per plant was obtained from Hybrid No. 3 Hybrid No. 8 in both seasons, respectively. While, the lowest number was recorded in Yathreb 100 in both seasons. The rest hybrids arranged between the highest and the lowest values.

4.4.Fruit weight:

The highest weight of the fruit was observed in Shahd Zaman in both seasons, followed insignificantly by Hybrid No. 22 and Hybrid No. 8 in the second season. While, the lowest weight was recorded in Super Quality and Hybrid SQ in both seasons, respectively, with insignificant differences between them. The rest hybrids arranged between the highest and the lowest values.

4.5.Total yield:

The highest and the lowest yield per plant were observed in Shahd Zaman and Super Quality, respectively, in both seasons. While, the rest hybrids arranged between them in both seasons. These results are in agreement with Hussien and Selim (2014) who studied 20 different hybrids of cantaloupe, resulting from 5x5 diallel under high temperature conditions, and reported that average fruit weight (gm) ranged from 558 to 986 gm for 25 genotypes, and the best crosses for total yield ranged from 12.2 to 13.7 ton/ feddan, while, premo commercial had 18.8 ton/ feddan.

Also, Hussien and Selim (2015a) found that average fruit weight ranged from 465 gm to 955 gm, while total yield ranged from 9.55 to 20.60 ton/ feddan, when evaluated four commercial hybrids. Hussien and Selim (2015b) studied the productivity and fruit quality of local resources of sweet melon, and found that the highest value for total yield was 23.7 ton/ feddan.

Depending on the susceptibility of ten local cantaloupe hybrids to aphid, whitefly, spider mite and leafMiner and their yield component, the present study can be suggest that the best hybrids are Shahd Zaman followed by Hybrid No. 8 and Hybrid No. 22, because of their high yield and their moderate infestation by most pests. This recommendation was built up on the data of two seasons under experimental conditions in Sohag Governorate .

Table (4): Mean number of main stem length and some yield component of ten loacal cantaloupe hybrids at Sohag Governorate during 2017 season.

	Main stem length (cm)	Flowering date (days)	Number of fruits/ plant	Fruit weight (gram)	Yield/ plant (KG.)
Super Quality	95.78 **e**	35.33 **a**	2.28 **d**	369.44 **g**	0.84 **e**
Yathrib 100	119.44 **c**	33.33 **b**	2.27 **d**	570.00 **c**	1.29 **d**
Hybrid No. 2	118.78 **c**	33.00 **b**	2.30 **d**	541.11 **cd**	1.24 **d**
Hybrid SQ	96.00 **e**	32.00 **b**	2.60 **c**	381.67 **fg**	0.99 **e**
Hybrid 100	104.78 **d**	33.00 **b**	2.70 **bc**	533.33 **cde**	1.43 **d**
Hybrid No. 22	115.22 **c**	35.67 **a**	2.31 **d**	779.44 **b**	1.80 **c**
Hybrid No. 7	130.78 **b**	33.00 **b**	2.90 **ab**	462.22 **def**	1.34 **d**
Shahd Zaman	179.00 **a**	35.33 **a**	2.80 **bc**	875.56 **a**	2.45 **a**
Hybrid No. 3	90.00 **e**	35.00 **a**	3.10 **a**	446.11 **efg**	1.38 **d**
Hybrid No. 8	131.67 **b**	35.33 **a**	2.77 **bc**	766.22 **b**	2.12 **b**
F. value	**122.43***	**5.97***	**9.94***	**35.31***	**40.62***
L.S.D.	**6.94**	**1.64**	**0.28**	**88.28**	**0.23**

Means followed by different subscript letters within columns are significantly different from each other ($P < 0.05$).

Table (5): Mean number of main stem length and some yield component of ten loacal cantaloupe hybrids at Sohag Governorate during 2018 season.

	Main stem length (cm)	Flowering date (days)	Number of fruits/ plant	Fruit weight (gram)	Yield/ plant (KG.)
Super Quality	93.56 **d**	35.67 **a**	2.49 **de**	395.00 **c**	1.01 **d**
Yathrib 100	127.78 **bcd**	33.00 **b**	2.34 **e**	583.33 **bc**	1.38 **cd**
Hybrid No. 2	123.78 **bcd**	33.00 **b**	2.39 **e**	547.78 **bc**	1.31 **cd**
Hybrid SQ	101.89 **cd**	32.33 **b**	2.60 **cde**	392.22 **c**	1.02 **d**
Hybrid 100	110.89 **bcd**	33.00 **b**	3.00 **abc**	542.78 **bc**	1.65 **bcd**
Hybrid No. 22	123.89 **bcd**	36.00 **a**	2.44 **e**	787.22 **a**	1.95 **abc**
Hybrid No. 7	137.67 **bc**	33.00 **b**	3.08 **ab**	477.22 **bc**	1.48 **cd**
Shahd Zaman	184.11 **a**	35.67 **a**	2.86 **bcd**	852.78 **a**	2.44 **a**
Hybrid No. 3	95.33 **d**	35.67 **a**	2.71 **bcde**	457.22 **c**	1.27 **cd**
Hybrid No. 8	139.67 **b**	35.00 **a**	3.39 **a**	672.22 **ab**	2.28 **ab**
F. value	**4.50***	**10.30***	**6.22***	**5.67***	**4.66***
L.S.D.	**37.53**	**1.37**	**0.41**	**196.22**	**0.68**

Means followed by different subscript letters within columns are significantly different from each other ($P < 0.05$).

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