

Influence of The Different Onion Varieties on the Population Density of the Main Insect Pests Infesting Onion Crop in Kafr El-Shekh Region.

Awadalla, S. S.¹ ; A. A. Taman² and A. A. Aboria²

¹ Economic Entomology Department, Faculty of Agriculture, Mansoura University, Mansoura, Egypt

² Field crop Insect Pest Department, Plant Protection Research Institute, Agricultural Research Center, Sakha, Egypt.



ABSTRACT

The current experiments were carried out in the Research Farm of the Agricultural Research Station in Sakha, Kafr El Sheikh Governorate, where three main onion varieties (Giza 6, Giza 20 and Giza Red) were cultivated, during 2013/14 and 2014/15 seasons, to study the influence of different onion varieties on the population density of the most important insect pests. The highest populations of all investigated insects were recorded on variety Giza 6 followed by Giza 20 and Giza Red during the two-successive season. This study showed that the highest average numbers of the onion thrips *Thrips tabaci* Lind. on Giza 6 were 316.6 ± 36.6 and 286.4 ± 34.1 nymphs during the first and second season, respectively. The highest average number of the onion aphid *Aphis gossypii* Glov was also recorded on Giza 6 and represented by 1124 ± 22.4 and 1061 ± 18.7 individuals, during the first and second season, respectively. The highest average numbers of the Onion maggot *Dalia allairia* Fonseca was also recorded on Giza 6 and represented by 37.7 ± 7.6 and 41.3 ± 8.5 during the first and second season, respectively. The onion varieties showed significant differences in their attraction to *T. tabaci* and *A. gossypii*, but not for *D.allairia*. For the Integrated Pest Management strategy for onion crop, Giza 6 has to be excluded from the approach of crop breeders and farmers due to its higher susceptibility for infestation.

Keywords: Aphis gossypii, Thrips tabaci, Dalia allairia, attraction, susceptibility, Integrated Pest Management,

INTRODUCTION

In Egypt, Onion (*Allium Cepa* L.) is an important field crop for both local consumption or for exportation. According to statistics of Ministry of Agriculture and Land Reclamation, the total area cultivated with onion crop in 2006 exceeded 80 thousand feddans produced over 950 thousand tons of onion bulbs (Mahmoud, 2008).

For integrated pest management program needs evaluation of the influence of some agricultural practices as planting dates and Onion varieties (Brar *et al.*, 1993; El-khayat *et al.*, 1997; Duchovskiene *et al* 2006 and Ruidar, 2015). Because of genetic variation on Onion varieties, thus, the resistant varieties could be used as an item in IBM Program. Also, a few information is available on the influences of the different Onion varieties on the population density of the main insect pests (Nawaz *et al.* 2003; Logos *et al* 2004; Alimousavis, 2007 and Jhon Diaz *et al.* 2012).

Therefore, the present experiments were carried out to study the influences of different Onion varieties during two successive seasons 2013/14 and 2014/15 in kafr-el shekh region.

MATERIALS AND METHODS

The current experiments were carried out in the Research Farm of the Agricultural Research Station in Sakha, Kafr El Sheikh governorate, where three main onion varieties Giza 6, Giza 20 and Giza Red were cultivated (during 2013/14 and 2014/15 seasons). This study was conducted to study the effect of Onion varieties on the main insect pests. Plants were transplanting in 6 January for each season. Three Onion cultivars namely, Giza 6, Giza 20 and Giza Red were obtained from Agriculture Research Station the Two successive seasons 2013/14 and 2014/15 in Kafr El-shekh Region. These experimental areas about 600 m² each Variety was about 200 m² divided into four replicates, each replicate was 50 m² replicates arranged in Completely Randomized Design. Each plot consisted

of 5 rows wide and 10m long with 10cm within rows and five cm between plants. No pesticides were applied in the plots during the experiment throughout the two seasons. Normal agricultures treatments were followed. Data on insect pests population were collected weekly from 10 randomly selected plants in each plot after one week from transplantation according to Hussain (1998) were taken early. Random plants were cut at the morning from base at weekly intervals and placed in plastic bag for counting in the laboratory by using stereoscopic- binocular and continued until the harvesting time of the crop.

The data obtained were analyzed using One-way ANOVA, and the Means were compared using Duncan's Multiple.

RESULTS AND DISCUSSION

The onion thrips (*Thrips tabaci*).

Data represented in Fig. (1) showed the total number and percentage of *T. tabaci* during the two successive seasons 2013/14 and 2014/15. The highest average number and its percentage of *T. tabaci* was recorded on Giza 6 and represented by 6331 individuals (36%) and 5724 indiv (37%) during the first and second season, respectively. While the lowest average number and its percentage was recorded on Giza Red which represented by 5799 indiv (33%) and 4726 indiv (31%) during the first and second season, respectively.

Data presented in Table (1) indicated that the highest numbers of *T. tabaci* were recorded on Giza 6 with average of 316.6 ± 36.6 and 286.2 ± 34.1 indiv during the first and second season, respectively. While, the lowest average number of *T. tabaci* was recorded on Giza Red with an average number of 278.2 ± 30.1 and 247.6 ± 29.2 during the first and second season, respectively.

Statistical analysis revealed that there were significant differences among onion varieties in the numbers of *T. tabaci* during both seasons of study.

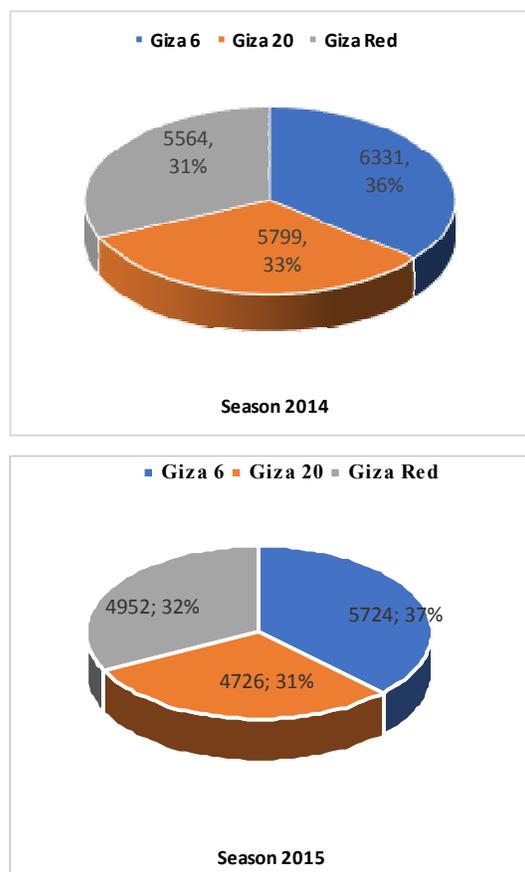


Fig. 1. The total number and percentage of *T. tabaci* on different varieties during the first (2013/14) and second (2014/15).

Table 1. The number (\pm SE) of *T. tabaci* on varying onion varieties during the first (2013/14) and second (2014/15) in Kafr El-Shekh Governorate.

Varieties	Season 2013/14	Season 2014/15
Giza 6	316.6 \pm 36.6 a	286.2 \pm 34.1 a
Giza 20	289.9 \pm 31.1 b	236.3 \pm 29.2 c
Giza Red	278.2 \pm 30.1 b	247.6 \pm 29.2 b

In a Colum means followed by the same letter are not significantly different at the 5% probability.

The onion Aphid (*Aphis.gossypii*).

Data represented in Fig. (2) showed the total number and percentage of *A.gossypii* during the two successive season 2013/14 and 2014/15. The highest total number and its percentage of *A.gossypii* was recorded on Giza 6 variety and represented by 2248 indiv (40%) and 2122 indiv (42%) during the first and second seasons respectively. While the lowest total number and its percentage was noticed on Giza Red which represented by 1662 indiv (29%) and 1422 indiv (28%) during the first and second season respectively.

Data presented in Table (2) indicated that the highest average number of *A.gossypii* were recorded on Giza 6 with average of 112.4 \pm 22.4 and 106.1 \pm 18.7 individuals during the first and second seasons. while, the lowest average number of *A.gossypii* was recorded

on Giza Red Varity with an average number of 83.1 \pm 18.7 and 71.1 \pm 15.7 during the first and second season respectively.

Statistical analysis revealed there were significant differences among Onion varieties in number of *A.gossypii* during both season study.

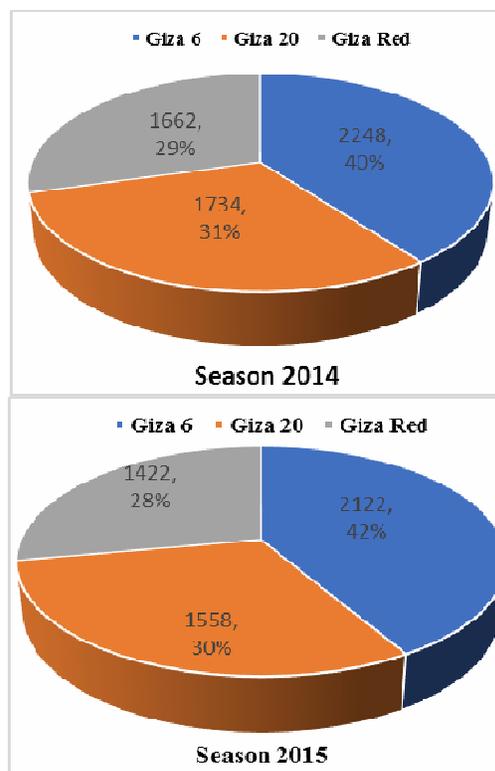


Fig 2. Total number and percentage of *A.gossypii* in different varities during seasons 2013/14 and 2014/15 in Kafr El-Shekh Region.

Table 2. The number (\pm SE) of *A.gossypii* on varying onion varieties during the first (2013/14) and second (2014/15) in Kafr El-Shekh Governorate.

Variety	Season 2013/14	Season 2014/15
Giza 6	112.4 \pm 22.4 a	106.1 \pm 18.7 a
Giza 20	86.7 \pm 18.1 b	77.9 \pm 14.6 b
Giza Red	83.1 \pm 18.7 b	71.1 \pm 15.7 b

In a Colum means followed by the same letter are not significantly different at the 5% probability.

The onion pulb (*Dalia.alliria*).

Data represented in Fig. (3) showed the total number and percentage of *D.alliria* during the two successive season 2013/14 and 2014/15. The highest total number and its percentage of *D.alliria* was recorded on Giza 6 variety and represented by 754 indiv (40%) and 825 indiv (36%) during the first and second seasons respectively. While the lowest average number was noticed on Giza Red and represented by 559 indiv (29%) and 723 indiv (31%) during the first and second season seasons, respectively.

Data presented in Table (3) indicated the average number of *D.alliria* which attacking onion varieties during 2013/14 and 2014/15 seasons. the highest

average number of *D.alliria* was recorded on Giza 6 variety with average number 37.7 ± 7.6 and 41.3 ± 8.5 individuals during the first and second seasons respectively. While, the lowest average number of *D.alliria* was recorded on Giza Red Variety with an average number of 27.9 ± 6.6 and 36.2 ± 7.8 during the two seasons, respectively.

Statistical analysis revealed that there were insignificant differences among Onion varieties and *D.alliria* during both season study.

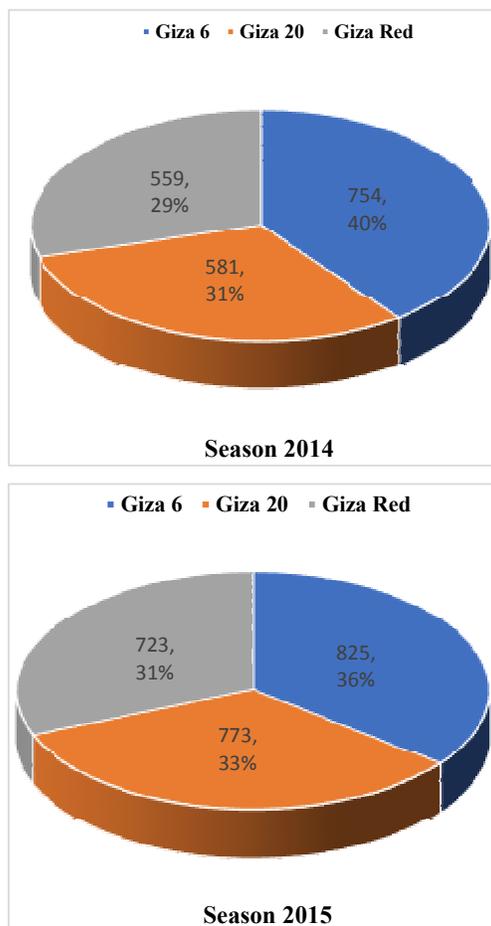


Fig 3. Total number and percentage of *D.alliria* in different varieties during seasons 2013/14 and 2014/15 in Kafr El-Shek Region.

Table 3. The number (\pm SE) of *D.alliria* on varying onion varieties during the first (2013/14) and second (2014/15) in Kafr El-Shekh Governorate.

Variety	Season 2013/14	Season 2014/15
Giza 6	37.7 ± 7.6 a	41.3 ± 8.5 a
Giza 20	29.1 ± 6.5 a	38.7 ± 7.9 a
Giza Red	27.9 ± 6.6 a	36.2 ± 7.8 a

In Colum means followed by the same letter are not significantly different at the 5% probability.

The results are in agreement with those of Salman, 2000 who showed significant deference between all onion variety of were liable to infestation by *T. tabaci* and *D.alliria*. the onion variety shandweel 1

demonstrated the highest infestation recorded, meanwhile Giza 20 variety showed the least parameter El-Khayat *et al.* (1997) who showed significant deference between three planting dates in the numbers of the main insect pests attacking Onion variety in Egypt. Coudriet *et al.*, 1979 found that the onion cultivar 'Nebuka' had 48, 72, and 67% fewer adult onion thrips, *T. tabaci* Lindeman, caught on sticky-card traps than cultivars; Texas Early Grano 502, Tenas Early Grano 951 and creoler, respectively, Nawaz *et al.* 2003 Local kandhari variety followed by sariab surkh were the most susceptible to thrips infestation while chiltan -89 was the least. Kalafchi *et al.* 2006 they found that significant differences were observed between cultivars in terms of the population density of the onion thrips. The highest population density of thrips was observed in cv. (Azarshahr) whereas cultivars Ghome, Kashan, Kavar, Abarkooh and yellow sweet Spanish recorded low population of thrips.

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تأثير بعض الاصناف المختلفه على الكثافة العددية لأهم الحشرات التي تصيب محصول البصل في منطقة كفر الشيخ.
سمير صالح عوض الله^١ ، أحمد عبدالرحمن طمان^٢ وأحمد عبدالرحمن أبوريه^٢
^١ قسم الحشرات الاقتصادية - كلية الزراعة - جامعة المنصورة - مصر.
^٢ معهد بحوث وقاية النباتات - مركز البحوث الزراعية - سجا - مصر.

أجريت التجربة في المزرعة البحثية بمحطة البحوث الزراعية بسجا محافظة كفر الشيخ حيث تم زراعة ثلاثة أصناف من محصول البصل الأساسية وهم جيزة ٦ و جيزة ٢٠ و جيزة أحمر (خلال موسمي الدراسة ٢٠١٣/٢٠١٤ و ٢٠١٤/٢٠١٥) لدراسة تأثير هذه الأصناف المختلفة على الكثافة العددية ومتوسط التعداد لأهم الآفات الحشرية. أوضحت الدراسة أن صنف جيزة ٦ أعلى كثافة عددية متبوعا بجيزة ٢٠ ثم جيزة أحمر في الإصابة بمجموعة من الحشرات الأساسية التي تصيب محصول البصل خلال الموسمين على التوالي ٢٠١٣/٢٠١٤ و ٢٠١٤/٢٠١٥ في منطقة كفر الشيخ. وأظهرت الدراسة أن أعلى متوسط تعداد لحشرة تريبس البصل على صنف جيزة ٦ خلال الموسمين المتعاقبين كان (316.6 ± 36.6 و 286 ± 34.1) على التوالي. وسجل صنف جيزة ٦ أعلى متوسط تعداد لحشرة من البصل وكان (1124 ± 22.4 و 1061 ± 18.7) فرد خلال الموسم والثاني على التوالي. وكان أعلى متوسط تعداد لحشرة ذبابة البصل الصغيرة سجل على صنف جيزة ٦ كالأتي (37.7 ± 7.6 و 41.3 ± 8.5) أثناء الموسم الأول والثاني على التوالي. وأظهرت النتائج فروق معنوية في جذب تريبس البصل ومن البصل ولا توجد فروق معنوية بالنسبة لذبابة البصل الصغيرة. وعند وضع استراتيجيات مكافحة المتكاملة لمحصول البصل يراعى أن الصنف جيزة ٦ أكثر حساسية للإصابة بأهم الآفات الحشرية.