

## RELATIVE SUSCEPTIBILITY OF CERTAIN ONION VARIETIES TO THE INFESTATION OF THE ONION THRIPS, *Thrips tabaci* (LIND.) AND THE ONION MAGGOT, *Delia alliaris* (MEIGEN) IN UPPER EGYPT

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### ABSTRACT

The susceptibility of some onion varieties namely, Giza 20, Giza 6 Mohassan and Shandweel 1 to onion thrips and onion maggot infestation was tested during two successive onion growing seasons, 97/98 and 98/99. It was found that all onion varieties were liable to the infestation by *Thrips tabaci* and *Delia alliaris*. The onion variety Shandweel 1 demonstrated the highest infestation records, meanwhile Giza 20 variety showed the least parameter. On the other hand, the rate of infestation for onion maggot varied greatly differences in the susceptibility for onion varieties. Giza 6 Mohassan variety harboured the highest infestation rates expressed as percentage of infestation while Giza 20 showed less susceptible. When the total bulb yield/fed., it was found that Giza 20 produced the highest yield weight figure followed by Shandsweel 1 and Giza 6 Mohassan onion varieties respectively.

### INTRODUCTION

Recently onion growing areas have been severely invaded by both onion thrips, (*Thrips tabaci* Lind.) and onion maggot fly, (*Delia alliaris* Meigen), particularly in Upper Egypt, according to Jones *et al.* (1934); Perron *et al.* (1960); Vernon *et al.* (1978); Ellis *et al.* (1979) and El-Serwi *et al.* (1985). Damage caused by *T. tabaci* and *D. alliaris* is the most important factor affecting negatively onion yield production.

Heavy infestations can retard growth of newly planted seedlings thus affecting photosynthesis through reduction of the leaf surface area. The evaluation of the relative susceptibility of onion plant varieties to *T. tabaci* and *D. alliaris* infestations is of economic importance. The determination of the susceptibility or plant defence mechanisms in certain onion varieties is considered as essential prerequisite to plant breeder.

The present investigation evaluate the triangular relationship between food suitability (host), population densities of insect pest and the corresponding yield production.

### MATERIALS AND METHODS

A field experiment was carried out in the Agricultural Experimental Farm at Faculty of Agriculture Sohag South Valley University during two successive seasons, 97/98 and 98/99.

An experimental area of 252 m<sup>2</sup> was divided into 12 equal plots, of 1/200 feddan each. Every plot was consisted of 9 rows and 60 cm apart.

Giza 6 Mohassan, Giza 20 and Shandweel 1 onion varieties were tested. The seedlings were planted with the rate of one plant/hill and 10 cm distance between hills. Each variety was replicated four times i.e. four plots of 12 were considered as replicates. All the experimental plots received the common agricultural practices and no chemical control treatments were applied. After 30 days of transplant weekly samples of 20 plants were taken randomly from each variety i.e. 5 plants/replicate. Each onion sampled plant was caged carefully and sealed separately in a polyethylene bag. Samples were examined in the laboratory under stereomicroscope and number of thrips in each plant was counted and recorded (Nymphs & adults).

The determination of the relative susceptibility of the tested varieties to onion maggot, *Delia alliarum* infestation, was calculated by simply finding out the number of infested plants (either containing larvae or pupa or just showing symptoms of infestation) and working out their ratio to the total number of plants in the samples.

$$\text{Infestation percentage} = \frac{\text{Number of infested plants}}{\text{No. of examined plants}} \times 100$$

On harvesting date the yield figures expressed as bulb weight in each plot (replicate) and according weight in tons/feddan was calculated.

## **RESULTS AND DISCUSSION**

Data presented in Table (1) show the susceptibility of three onion varieties to onion thrips, *T. tabaci* infestation during two successive onion growing seasons of 97/98 and 98/99.

In 97/98 season, statistical interpretation of the data indicate that the tested onion varieties varied significantly in their susceptibility to the pest. According to the L.S.D. value Shandweel 1 was the highest to be infested (253 individuals per plant). An intermediate infestation was recorded Giza 6 Mohassan variety with an average (213/plant). On other contrary, Giza 20 was the least susceptible variety (156/plant).

For 98/99 season, the same trend was observed, i.e. the highest infestation records was obtained for Shandweel 1 (259/plant) while Giza 20 demonstrates the least infestation rate (170/plant). An intermediate infestation rate was represented by occurred Giza 6 Mohassan (221/plant). Susceptibility of onion varieties to onion thrips, *Thrips tabaci* infestation has been mentioned by many authors. Lall and Verma, 1959; Verma, 1966; El-Habasha *et al.* 1979; Coudriet *et al.*, 1979; Maxwell and Jenings, 1980 and El-Serwiy *et al.* 1985 reported that non-preference for oviposition was a reasonably stable mechanism in all the environments in this study.

**Table (1): Effect of onion varieties on the population density of onion thrips, *T. tabaci* during two successive onion growing seasons, 97/98 and 98/99.**

Varieties	Mean number of onion thrips		Average
	97/98	98/99	
Shandweel 1	253.0*	259.0	256.0
Giza 20	156.0	170.0	163.0
Giza 6	213.0	221.0	217.0
LSD at 0.05	11.46	13.62	

\* Mean number of onion thrips, *Thrips tabaci* on onion varieties per plant.

Data presented in Table (2) demonstrate the effect of onion varieties on the infestation of bulbs with onion maggot *Delia alliaris* during two successive onion growing seasons, 97/98 and 98/99.

From the results, it is clear that the tested onion varieties differed significantly in their susceptibility to the pest.

In 97/98 season, Giza 6 Mohassan was the most susceptible variety as percentage of infestation reached 82.5, whereas Giza 20 was the least susceptible one (44.80%). An intermediate infestation was recorded in bulbs of Shandweel 1 (62.19%).

For 98/99 season, the same trend of infestation of the former season was also observed. Giza 6 Mohassan was the most susceptible variety, whereas an intermediate infestation was observed in bulbs of shandweel 1, meanwhile Giza 20 was the least susceptible one.

Susceptibility of onion varieties to the onion maggot, was discussed by many investigators. Perron *et al.* (1960) working in Canada, found that the cultivars of *A. fistulosum* were more resistant to onion maggot than those of *A. cepa*. Vernon *et al.* (1978) and Ellis *et al.* (1979) whom found that some onion varieties her ability to attractive or identification of oviposition simulants to oviposition by the onion maggot. El-Serwi *et al.* (1984) indicated that the local white and Behairi onion varieties were least susceptible to onion maggot infestation. Meanwhile, an intermediate infestation was observed in Local Red and Giza onion varieties. However, Texas Early Grano 502 onion variety was the most susceptible to onion maggot infestation.

**Table (2): Percentage of the infested onion bulb with onion maggot, *D. alliaris* as affected by onion varieties during two successive onion growing seasons, 97/98 and 98/99.**

Varieties	% infested bulb of onion varieties		Average
	97/98	98/99	
Shandweel 1	62.19	61.87	62.03
Giza 20	44.38	47.19	45.79
Giza 6	82.50	85.94	84.22
LSD at 0.05	5.64	8.02	

Data presented in Table (3) show the total bulb yield in tons/feddan as affected with onion thrips, *T. tabaci* and onion maggot, *D. alliaris* during two successive onion growing seasons, 97/98 and 98/99.

**Table (3): Total bulb yield in tons/feddan during two successive onion growing seasons, 97/98 and 98/99.**

Varieties	Total bulb yield in tons/fed.		Average
	97/98	98/99	
Shandsweel 1	11.83	10.09	10.96
Giza 20	15.20	16.50	15.85
Giza 6	10.10	10.45	10.28
LSD at 0.05	13.88	10.52	

Results obtained indicated that the statistical analysis of the data yielded a significant "F" value for the differences and L.S.D. 13.88 and 10.52 for two successive seasons, respectively. It clear that onion variety Giza 20 was the highest bulb yield one as the mean bulb yield 15.200 and 16.500 in tons/feddan for 97/98 and 98/99 seasons, respectively. An intermediate bulb yield observed in two varieties Shandsweel 1 (11.83 and 10.09) and Giza 6 Mohassan (10.10 and 10.45) in tons/feddan during two successive seasons, respectively. These results are in agreement with those obtained by El-Serwiy *et al.* (1984) who reported that onion varieties Behairi and Giza were the highest bulb yield, meanwhile Texas Grano 502, Local Red and Local white were the least bulb yield.

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### قابلية بعض أصناف البصل للإصابة بتربس البصل *Thrips tabaci* وذبابة البصل الصغيرة *Delia alliaris* بمصر العليا

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أجرى هذا البحث بمزرعة كلية الزراعة بسوهاج في موسمي زراعة البصل أعوام ٩٨/٩٧ ، ٩٩/٩٨ بهدف دراسة قابلية بعض أصناف البصل للإصابة بحشرتي ذبابة البصل الصغيرة وتربس البصل ولهذا الغرض أختبر ثلاثة أصناف من البصل الموصى بها في محافظة سوهاج وهم شندويل ١ ، جيزه ٢٠ ، جيزه ٦ بهدف التوسع في زراعة الأصناف المتحملة للإصابة بهاتين الحشرتين كإتجاهات حديثة في مكافحة ضمن خطة مكافحة المتكاملة (IPM) لأفات البصل بمصر العليا .

- ويمكن تلخيص النتائج فيما يلي :
- 1- أن حشرة تربس البصل لها القدرة على إصابة جميع الاصناف المختبرة ولكن تتفاوت شدة الإصابة معنوياً بين الاصناف الثلاثة تحت الدراسة .
  - 2- كان الصنف شندويل ١ من أكثر الأصناف قابلية للإصابة بهذه الحشرة وكان من أقل الأصناف حساسية للإصابة الصنف جيزه ٢٠ بينما كان الصنف جيزه ٦ محسن متوسط الإصابة بها.
  - 3- أن حشرة ذبابة البصل الصغيرة لها القدرة أيضا على إصابة جميع الأصناف تحت الدراسة ولكن تتفاوت شدة الإصابة (%) معنوياً بين الأصناف الثلاثة .
  - 4- كان الصنف جيزه ٢٠ من أكثر الأصناف تحملاً للإصابة بذبابة البصل الصغيرة بينما الصنف جيزه ٦ محسن من أكثر الأصناف حساسية لهذه الحشرة وأظهر الصنف شندويل ١ إصابة متوسطة بها.
  - 5- كان الصنف جيزه ٢٠ من أكثر الأصناف إنتاجاً للمحصول الكلي .
  - 6- وبذلك يمكن التوصية لمزارعي البصل بمحافظة سوهاج بالتوسع في زراعة الصنف جيزه ٢٠ حيث أنه من أكثر الأصناف تحملاً لحشرتي التربس وذبابة البصل الصغيرة ومن أكثر الأصناف إنتاجاً لمحصول البصل الكلي.