EGYPTIAN ACADEMIC JOURNAL OF
BIOLOGICAL SCIENCES
ENTOMOLOGY

A

ISSN
1687-8809

WWW.EAJBS.EG.NET

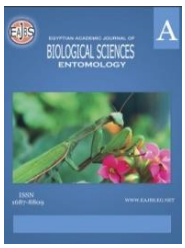
Vol. 14 No. 1 (2021)

Citation: *Egypt. Acad. J. Biolog. Sci. (A. Entomology) Vol. 14(1) pp.93-97 (2021)*
DOI: 10.21608/EAJBSA.2021.152213

Egypt. Acad. J. Biolog. Sci., 14(1):93-97(2021)

Egyptian Academic Journal of Biological Sciences
A. Entomology

ISSN 1687- 8809
http://eajbsa.journals.ekb.eg/



Survey on Population Changes of *Aphis gossypii* (Glove.) on Cluster Cultivars in Ultra Narrow Row system in the Field Cotton Golestan Province of Iran.

Mojeni,T.D.
Cotton Research Institute of Iran, Agricultural Research, Education and Extension Organization (AREEO), Gorgan, Iran.
E. mail: t_mojeni@yahoo.com

ARTICLE INFO

Article History
Received:16/1/2021
Accepted:26/2/2021
Keywords:
Aphis gossypii, UNR, cotton and Golestan province.

ABSTRACT

In the planting system, the row spacing is very narrow, where the spacing of the planting rows is considered to be between 20 and 40 cm. In this system, the number of bolls per plant is reduced. Experiments to survey and compare populations *Aphis gossypii* on 3 cluster cultivars and one control, using the method of narrow planting distance of 20 × 20 and 20 × 80 cm as a factorial design in the form of a randomized complete block design with 3 replications in Hashemabad cotton research station in Gorgan during two years 2018- 2019 was evaluated. A sampling of different stages of cotton aphids was recorded weekly in the tested treatments and recorded in special tables. Based on the studies, the results of combined analysis of variance show that the yield in the cultivars tested in Sajedi cultivar with a distance of 80 cm with an average wash of 3392 kg/ha in the plot and Golestan cultivar 80 cm with 3245.8 kg/ha in the plot with the highest yield and T2 cultivar with a distance of 20 cm, 1694 kg/ha in Crete had the lowest yield. Infestation rate of cluster cultivars tested in very narrow cultivation of green aphid population density on Sajedi cultivars with a distance of 80 cm and the khorshid with a distance of 20 cm with densities of 41.39 and 40.36 aphids per leaf, respectively, with the highest aphids per leaf and cultivars T2 and the khorshid with a distance of 20 cm with 23.59 and 29.04 aphids, respectively. They had the least infestation in the leaves.

INTRODUCTION

In the planting system, very narrow row spacing (UNR) Compared to the planting system of spaced rows, there will be noticeable changes in the number of bolls per plant and common conditions. Reduce cotton production costs, especially by creating prematurity; reduce pesticide consumption by disrupting the pest life cycle (Philip, 2000 and 2001).

The infestation of the tested varieties in cultivation are very narrow thrips populations (*Thrips tabaci*) on Sahel and Golestan cultivar with 25cm respectively, 3.52 and 3.11 thrips per leaf has the highest infestation and number density on Sahel with distance 80cm 1.24 thrips per leaf have shown minimal infestation. The yield rate of the

tested intervals Golestan cultivar distance of 80 cm with an average yield of 4422.87gr/plots maximum yield and Sepid with a distance of 25 cm with an average yield of 3108.33gr/plots had the lowest yield (Mojeni, 2019).

Infestation levels of cultivars of cotton aphid population (*Aphis gossypii*), Golestan and sepid with a distance of 80cm, respectively, with a density of 53.42,49.18 and 41.35 aphids per leaf has the highest infestation, Sepid and Sahel varieties 25cm, respectively, with a density of 9.26 and 7.11 aphids per leaf had the lowest infection. Population bemisia (*Bemisia tabaci*) levels of cotton cultivars in Golestan, Sahel and Sepid 25cm respectively with densities of 27.63,24.31 and 20.86 bemisia on leaf number, maximum infection and Sepid variety with a distance of 80cm with a density of 6.15 bemisia number of leaves have the least infestation (Mojeni, 2019).

Simultaneous ripening of bolls or their faster maturation leads to more efficient use of hormones, insecticides, and increased yield. Increasing crop yield by increasing density in the mentioned method, regardless of weather conditions, has been reported in some reports (Jesus, Rossi, *et al.,* 2004). Faster closure of the canopy or canopy surface can drastically reduce the habitat for weeds (Philip, 2000). On the other hand, this reduces water evaporation after irrigation and saves its consumption (Jesus, *et al.,* 2004). In a review to determine variety with three densities of 1, 5, 9 plants per row and four genotypes of very early, early, medium maturity, and full maturity were applied. The results showed that the fiber yield at 9 plant density per row was further reduced compared to 1 and 5 plant densities. (Wright, *et al.,* 2011). In another study, three densities were performed by spacing 25, 50, and 100 cm with three cotton varieties. It was concluded that density was highly effective on morphological traits and yield components. Medium densities showed higher maturity and higher yield compared to higher densities, no significant differences were observed between cultivars. Also, the interaction effect of cultivars on density was not significant (Philip, 2001).

Narrow row cultivation of cotton production can have a significant impact on insect management. Pests such as aphids, whiteflies, and spider mites are reduced by the width of the row. Almost all cotton pests can be controlled indirectly with a very narrow culture system (Jesus, Rossi, *et al.,* 2004).

In China, various UNR cropping systems are carried out on a large scale in more than 1 million hectares of cotton fields about 10 years are dedicated to this method of cultivation. One of the potential benefits of ultra-narrow cotton row systems is that they reduce production costs under certain conditions and make it possible to increase yields, especially in poor soils or short areas of the season (Bin Mohamad and Sappenfield, 1982).

The increase in early maturity in cotton cultivation without yield reduction is achieved by increasing the number of plants per hectare (Kerby, *et al.,* 1990).

MATERIALS AND METHODS

This research was carried out in Hashemabad cotton research station in Gorgan in 2018-2019. The treatments included 3 cluster cotton cultivars (Khorshid, T2 and Sajedi and Golestan cultivar) with two narrow planting distances of 20 × 20 and 20 × 80 cm as a factorial design. Random complete blocks were evaluated in three replications. Each plot consisted of 10 planting lines of 12 m with a planting pattern of 20 × 20 and 20 × 80 cm. Two sidelines and a half meters from the beginning and end of each row are considered as margins and all statistics were performed from the middle rows. After the emergence of pests in the field, to study population changes *Aphis gossypii* regular weekly sampling was performed on plants on 15 leaves per plot.

The performance was also yielded variety measured in the experiment. The obtained data were analyzed as a factorial experiment in a randomized complete block design using SAS software and the mean data were compared by Lsd test.

RESULTS AND DISCUSSION

Based on studies conducted during two years of experimentation and statistical analysis, data conversion and combined analysis of variance performed on yield and green cotton aphid show:

In terms of average yield, the amount of washes obtained in cluster cultivars tested in very narrow crops by performing combined analysis of variance in Sajedi cultivar with cultivation distance of 80 cm with 3392kg/ha and Golestan 80 cm with 3245.8kg/ha in Crete has the highest yield in Group a and Golestan and T2 cultivars with a distance of 20 cm with 2168.5kg/ha and 1694 kg/ha, respectively, in group c with the lowest yield at the level of 5% showed a significant difference (Tables 1 and 2).

Infestation rate of green cotton aphid population in the treated treatments by performing combined analysis of variance on cluster cultivars tested in very narrow cultivation Sajedi cultivars 80 cm and Khorshid 20 cm with densities of 41.39 and 40.36 aphids per leaf, respectively, with the highest infestation in group A and cultivars Khorshid and T2 with a distance of 20 cm with a density of 29.03 and 23.59 aphids per leaf in group b at a level of 5% compared to the control showed a significant difference (Tables 3,4 and Fig.1).

The activity of green cotton aphid in cotton fields generally starts with the appearance of buds and flowers on cotton plants and its peak activity is observed in July to late August in Gorgan cotton fields.

The activity of the pest in 2011 was due to warmer weather conditions with less density. So that Golestan cultivar with a distance of 80 cm with 1.3 aphids per leaf showed the highest density and Sepid cultivar with a distance of 80 cm with 41.35 aphids per leaf had the lowest density. In 2012, aphid population activity was observed among the treatments due to favorable cloudy and humid weather conditions. Golestan cultivar with a distance of 25 cm 53.42 aphids per leaf and white cultivar with a distance of 80 cm 41.35 per leaf with the highest density and Golestan cultivar with a distance of 80 cm 49.18 aphids per leaf have the lowest density. Therefore, the longer the planting distance, due to more exposure between plants, the density of cotton aphids decreases (Mojeni, 2019). In the studied cluster cultivars, Sajedi and Khorshid cultivars with a distance of 80 and 20 cm with 41.39 and 40.36 aphids per leaf had the highest infection and T2 cultivars with a distance of 20 cm with a density of 23.59 aphids per leaf had the least infection. According to research (Jesus, Rossi, *et al.*, 2004) in India on the effects of the very narrow crop on cotton cultivation on important pests such as aphids, whiteflies, and spider mites are reduced due to row width. Almost all cotton pests can be controlled indirectly with a very narrow culture system. Also, the increase in the number of cotton plants from 50,000 plants per hectare to 125,000 plants per hectare in the population of important sucking pests such as thrips, aphids and whitefly was easily controlled due to the increase of their natural enemies in the cotton field (Wright, *et al.*, 2011). This has similar results to research conducted in cotton cultivation on the population of important sucking pests such as thrips, aphids and cotton honey with the least infestation in Golestan cultivar with a distance of 80 cm in Gorgan and important sucking pests can be easily controlled.

Table 1: Analysis of composite variance related to cotton yield (kg/ha) in cluster cultivars in very narrow agriculture at Hashemabad station 2018-2019.

Sources of changes	df	S. S	MS	F
Rep.	2	0.226	0.113	0.71ns
Treat.	7	0.307	0.044	0.28**
year	1	7.821	7.821	49.10**
Erro.	37	5.894	0.159	
CV	14.17 %			

Table 2: Comparison of mean Lsd and grouping of performance-related treatments.

Treat. (variety)	Average yield(kg/ha)	5 %
Sajedi 80 cm	3392	a
Golestan 80 cm	3245.8	a
Khorshid 80 cm	2590	ab
T2 80 cm	2392.2	ab
Sajedi 20 cm	2079.4	b
Khorshid 20cm	1826.6	b
Golestan 20 cm	2168.5	bc
T2 20 cm	1694	c

Table 3: Analysis of composite variance related to the effect of very narrow agriculture on the population of green cotton aphid *Aphis gossypii* (Glov.) On cluster cultivars in Hashemabad station 2018-2019.

Sources of changes	df	S. S	MS	F
Rep.	2	1.534	0.767	6.26**
Treat.	7	0.474	0.068	0.55*
year	1	0.061	0.061	0.50*
Erro.	37	4.536	0.122	
CV	23.02 %			

Table 4: Comparison of mean Lsd and grouping related to a population density of green cotton aphid in treatments.

Treat. (variety)	Aphids (Num/leaf) average.	5 %
Sajedi 80 cm	41.39	a
Khorshid 20cm	40.36	ab
Golestan 80 cm	38.89	ab
Sajedi 20 cm	36.47	ab
T2 80 cm	32.31	ab
Golestan 20 cm	31.58	ab
Khorshid 20 cm	29.04	ab
T2 20 cm	23.59	b

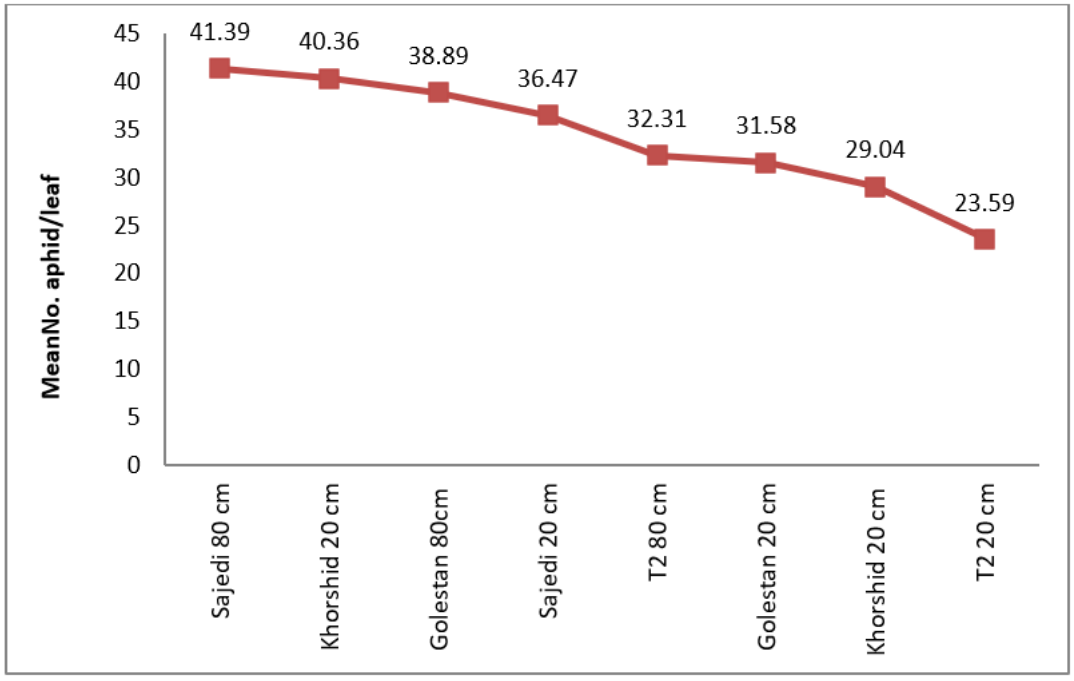


Fig. 1: Mean changes of population *Aphis gossypii* on cotton cluster cultivars in Golestan province 2018-2019

REFERENCES

Bin Mohamad,K.and Sappenfield, W.P. (1982). Cotton cultivar response to plant populations in a short-season, narrow row cultural system.*Agronomy journal*, 74:619-625.

Jesus Rossi, G.; Novick, J.; Murray, J.; Landivar, S.; Zhang, D.; Baxevanos,. A.; Mateos,T; Kerby, K. Hake, and Krieg, D. (2004). Ultra-Narrow Row Cotton: Global Perspective. Papers Presented at the Technical Seminar at the 63rd Plenary Meeting of the Internatonal Cotton Advisory Committee, Mumbai, India November 2004.

Kerby, T. A.; Cassman,K.G.and Keeley,M.(1990).Genotypes and plant densities for narrow row cotton cystems. I.Heigth.nodes. earliness and location of yield. *Crop Science*, 36:644-649.

Mojeni ,T.D.(2019).Fluctuation of sucking pest populations *Aphis gossypii* (Glove.) and *Bemisia tabaci* (Gen.) in the Ultra Narrow Row the cotton fields of Golestan province of Iran.Jou.Nov.*Applied Science*,Vol(8).Iss.(4).P:93-97.

Mojeni, T.D.(2019). Study on Ultra Narrow Row system in cotton culture on population dynamic of *Thrips tabaci* (L.) in the fields of Golestan province.Jou.Nov. *Applied Science*,Vol(8).Iss.(8).P: 166-169.

Philip H. Jost. (2001). Phenotypic alternations and crop maturity differences in ultra-narrow and conventional spaced cotton. Crop Sci: 41:1150-1159.Philip H. Jost. 2000. Growth and yield comparisons of cotton planted in conventional and ultra-narrow row spacing. *Crop Science*,40:430-435.

Wright,D. L.; Marois, J. J.; Sprenkel, R. K. and Rich, J. R. . (2011). Production of Ultra Narrow Row Cotton. Institute of Food and Agricultural Sciences, University of Florida. website at http://edis.ifas.ufl.edu.