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Study on Ultra Narrow Row system in cotton culture on population dynamic of *Thrips tabaci* (L.) in the fields of Golestan province.

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ABSTRACT: One of the practical implications of cotton cultivation, Is the distance between rows very narrow or that called UNR. In this method instead of in row spacing of 40 cm below the open space will be used. This planting method saves pesticide use, water, reduce weeding costs, increase production, and cotton is premature. In this two-year trial to assess the effects of agriculture on the population within a very narrow row sucking- pests *Thrips tabaci* (L.) during 2014-2015. Factorial experiment to evaluate and compare the population dynamic of sucking-pests , Sahel, Sepeid and Golestan varites (Factor A) using two methods spacing narrow 80 × 20 and 25 × 20 cm (factor B) in the form of randomized complete block design in 3 replicates were evaluated . Samplings done weekly in each sampling 5 plants were selected randomly and in each plant 3 leaves from top, middle and bottom were inspected and the number of important sucking insects (thrips) was counted and rerecorded. The data was analysis by MSTAT Mean comparison revealed, thrips population density is very narrow gap in agriculture, 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. Infection of the tested varieties in cultivation are very narrow thrips populations on Sahel and Golestan cultivar with 25cm respectively, 3.52 and 3.11 thrips per leaf has the highest infection and number density on Sahel with distance 80cm 1.24 thrips per leaf have shown minimal infection. Therefore Golestan cultivar with an average yield important sucking pests such as thrips population infection, the lowest cotton cultivation in agriculture ultra-narrow row 80 and 25 centimeters had in the cotton fields.

***Keywords*:** Ultra narrow row, Cotton cultivar, *Thrips tabaci* and cotton.

INTRODUCTION

In the planting system, very narrow row spacing with spacing of rows between 20 and 40 cm is considered (Kirby *et al.,* 1990). Compared to the more spaced row spacing system, there will be evident changes in the number of bolls per plant and the state of the canopy. In this system, the number of bolls per plant and plant height and length of branches and decreases (Galanopoulous,*et al.,*1980). Reducing cotton production costs, especially through early maturity, reducing pesticide use by interrupting the critical cycle of pests, reducing irrigation water consumption is one of the benefits of dense planting and in different ways, including planting narrow and very narrow intervals, plating a clump. Also, with the advent of mechanized, early harvesting of cotton has become very important. Agronomic and environmental factors that have a great effect on the precociousness of the product, we can plant density, Plant pest control, nitrogen fertilizer management and proper irrigation periods. More densities generally increase aging, but management of such farms is very important. In this type of farming, due to increased competition, the loss of buds increases, which in each plant leads to a decrease in yields (Kucheki, 1985).

The this study was to determine the effect of plant density on three cotton cultivars,The cultivar Saiokra 324 had more yield and yield than the number of bolls per plant. This figure is more than 400 to 600 kilograms in comparison to the sahel variety and produces more than 200-500 kilograms from Zeta-2 variety. In all cultivars, the highest yield

was obtained at high plant densities, so that the highest yield in sahel cultivar was observed at plant densities of 125,000 plants per hectare, In the cultivar Saiokra 324 at a plant density of 125000 and 62500 plants and In Zeta-2 cultivar, 125000 plants were also reported. There are different opinions about the effect of row spacing on performance in different studies. Cotton farming is expanding in ultra-Narrow Row in cotton growing countries (Ghajari and Ghadrei,F.2006). Advantages of this method of planting include the increase of early maturity and yield of the plant under dry conditions (Philip, 2000, 2001).

Philip (2001) examined three densities by spacing between planting lines (25, 50, 100 centimeters) and stated that Plant density will greatly affect morphological traits and yield components. More densities decrease vegetative growth and produce crops. Cultivation of cotton in narrow strips can have a significant impact on insect management; however, little information is available to insect control strategies for insect control. The damage to pests such as aphids, white flies, and spider mites reduces row crops. Almost all cotton pests can be indirectly controlled by a very narrow cultivation system (Jesus Rossi, *et al.,*2004). Increasing the number of cotton plants from 50 thousand to 125 thousand bee hectares the populations of important sucking pests such as thrips, aphids and white fly were easily controlled due to increased natural enemies in the cotton field (Wright, *et al.,*2015). In studies conducted on the rate of infection of successful cotton lines to major pest killers of the Tbl-180, N2G80, Skt-133 and Skt-134 lines in comparison with the common cultivar of Golestan province, the most common pests have the lowest amount of infection. In researches on the amount of infection of the population of sucking pests in Golestan province, the Skt-134, Tbl-80 and N2G80 hybrids has the least infection with the major suckling pests such as thrips, aphids, white fly and cotton leafhoppers (Darvish, Mojeni, 2012,2013). The aim of this study was to investigate the effects of very low distance farming (UNR) on the populations of sucking pests in arable crops in Golestan province for the first time.

Material and Methods:

This research was carried out at Hashem Abad Cotton Research Station in Gorgan during 2015-2016. Treatments were three cotton cultivars (Golestan, sahel and Sepid) and two narrow spacing of 20 × 25 and 80 × 20 cm were evaluated in a factorial experiment in a randomized complete block design with three replications. Each plot contained 10 12-meter plantations. After emergence of pests in the field, to study the changes in the population of important sucking pests (thrips) sampling was carried out on a regular basis on a weekly and random basis on plants. In each plot, 15 leaves were discarded in circular form of 5 plants different stages of sucking pests (nymph and adults) were counted and recorded in special tables (Jesus Rossi, *et al.,*2004 and Darvish, Mojeni, 2012). The performance of each experimental plot after the removal of two lateral lines and one meter margin from the beginning and the end of each row were measured all records were taken from the middle rows. The data were obtained as a factorial experiment in a randomized complete block design Data were analyzed using MSTAT software and the mean of data was compared with Duncan's multiple range test.

Results and Conclusion:

According to the studies carried out, the data obtained from or transduction of different traits showed the results of the analysis of the combined mean of the test data the treatments of cultivars have a significant difference in cultivars in very narrow rows. Golestan cultivar with 80 cm spacing with 4423 kg and 25 cm golestan with 3946 kg/ ha had the highest yield of group A and sahel and Sefid cultivars were 25 cm with 3165 and 3108 kg respectively in group C With the lowest yield in the level of 5% ($p = 0.004$, $f = 7.33$, and $df = 2$, respectively) (Table 1). There was no significant difference between the effects of the traits in the experiment and the results were not presented. In terms of population density, there was no significant difference between sucking pests among cultivars.

Moderate plant density in improved cultivars for very thin crops is more rapid and more efficient compared with other densities (Galanopoulos, 1980). According to the table, the final conclusion of the test should be that the number of plants per hectare should increase. Because the level of shading of the plant increases and decreases the amount of light among the cotton plants, for this reason, there is a significant difference among the available cultivars in terms of population density of thrips and cotton aphid. On the three cultivars tested, it was significant in terms of yield and Golestan cultivar with a distance of 80 and 25 cm had the most suitable yield (4423-3946 kg/ ha), in terms of the population of the most important pests, the sucking pest had the least infection.

Infection of the tested varieties in cultivation are very narrow thrips populations on Sahel and Golestan cultivar with 25cm respectively, 3.52 and 3.11 thrips per leaf has the highest infection group a and number density on Sahel with distance 80cm 1.24 thrips per leaf have shown minimal infection group b in the level 5 % ($p = 0.124$, $f = 2.33$, and $df = 2$, respectively) (Table 1, fig1). Therefore, the study of changes in the population of thrips on experimental cultivars showed a very narrow cultivar that Golestan cultivar had higher yield and less population density than *Thrips tabaci* compared to other cultivars.

Thrips pest in cotton fields of Gorgan region from May to late June is from 2 leaf stage to 6-8 leaves of cotton plant and causes damage in cotton fields (Darvish Mojeni, 2012 and 2013).

According to the results of this study, the Thrips population has decreased in very narrow agriculture. So that the Golestan cultivar is 25 cm apart, 1.2 times the thrips in the leaf with the highest density and the same digits with a distance of 80 cm, 0.9 times the thrips in the leaf of the next group. Therefore, the higher the plant density per unit area, the greater the amount of thrips on the cotton plant. This is due to the shading level for the thrips activity.

This is done by investigating that the very narrow production of cotton rows can have a significant impact on insect management. Pests such as aphids, white whites and thrips with a very narrow culture system can be directly controlled (Jesus Rossi *etal.,* 2004).Which is consistent with the studies in this research.

Therefore, Golestan cultivar is recommended for very narrow row cultivation and can have a significant impact on the integrated management practices of pests in Gorgan region.

Table1**.**Comparison of the mean of different traits in UNR cultivation system on Population of *Thrips tabaci* (L.)

Thrips(N. leaf)	Yield (kg/ha)	Treatment / cultivar
3.52±0.28a	3946±473ab	Golestan 25 cm
3.11±0.44a	3165± 379 c	Sahel 25 cm
2.30±0.46ab	3108±372 c	Sepid 25 cm
2.01±0.58ab	3780±453b	Sahel 80 cm
1.89±0.18ab	4422±530a	Golestan 80 cm
1.24±0.18b	3331±398bc	Sepid 80 cm
17.87%	12.44 %	CV %
0.213	858.94	Stde

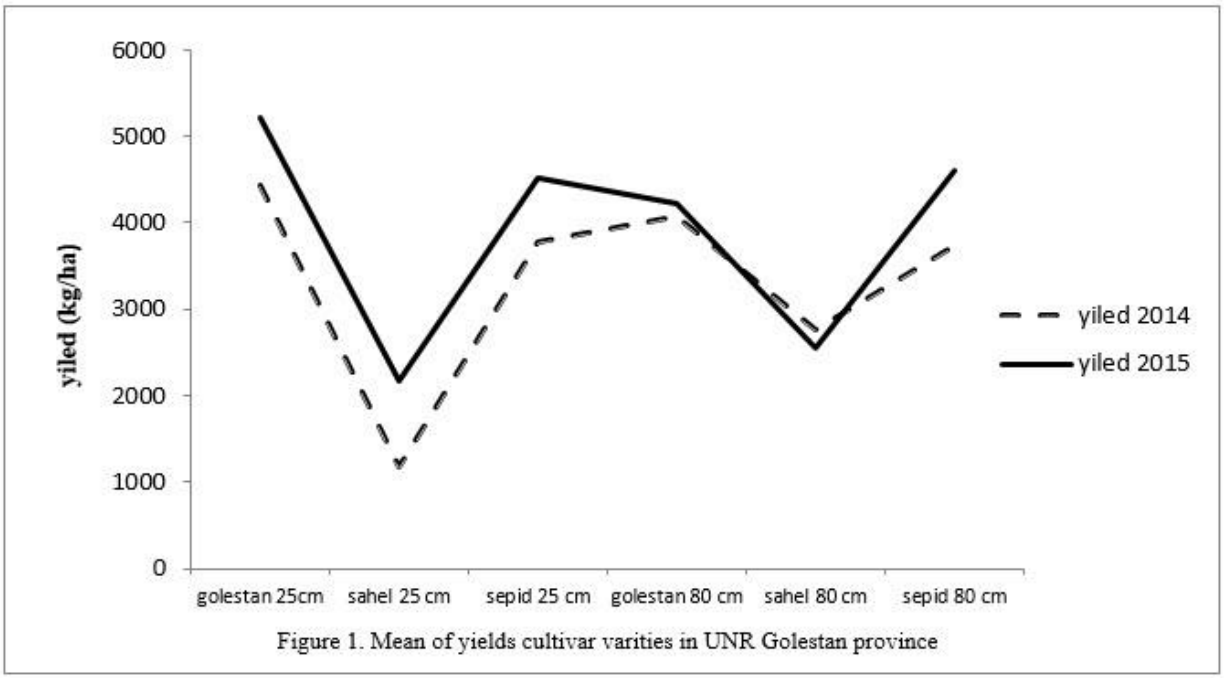

Figure 1. Mean of yields cultivar varities in UNR Golestan province

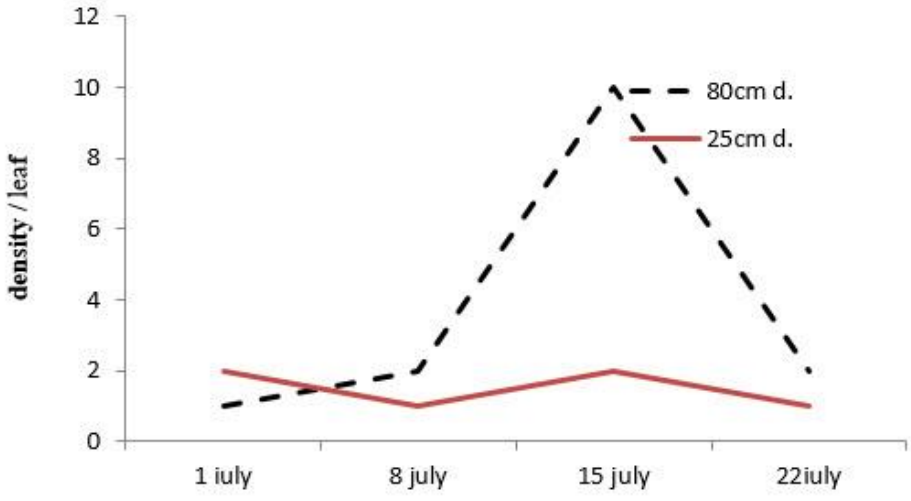

Figure 2. Mean of poplation daynamic of *Thrips tabaci* on golestan cultivar

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