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Study on population dynamic of cotton green leafhopper, *Asymmetrasca decedens* (Paoli) in the cotton fields of Golestan province

Mojeni, T. D

Cotton Research Institute of Iran, Agricultural Research, Education and Extension Organization (AREEO), Gorgan, Iran

***Corresponding author*:** Mojeni, T. D

ABSTRACT: Leaf hoppers are important pests of crops including cotton. This research was carried out during 2014- 2015 to identify the main leaf hopper species collected in the cotton fields of Golestan province and to study population of cotton green leafhoppers dominant ones. The specimen were collected and brought to the laboratory. The results revealed that following the species had the highest population in cotton fields:1- *Asymmetrasca decedens* (Paoli,1932). 2- *Psammotettix alienus* (Dahlbom, 1851).3- *Emposca decipiens* (Paoli, 1930). 4- *Jacobiasca lybica* (Bergevin & Zanon, 1922). *A. decedens* was determined as dominant species. The peak of activity this insect was late in June to late in August in the cotton feilds. The biological characteristics of A. *decedens* were stuied in the laboratory condition (24 ±1 °C. and 75 ± 5 % R.H) 25 – 35 days with egg incubation period of 7 – 9 days and nymphal duration of 10 – 15 days. The longevity of adults was 8- 11 days. This pest had 5-6 generation per year and over wintered as adult under weeds. The main important cultivated host plants of this pest are cotton, potato, faba bean, rapeseed, soybean and cucurbit and its wild hosts are black night shade, pigweed, mallow and goose weeds.

***Keywords*:** Cotton, Leaf hopper, Biology and Golestan province.

INTRODUCTION

Green leafhopper, cotton suction *Asymmetrasca decedens* an important pest in cotton fields in Golestan province in recent years is considered. These pests suck sap, causing damage to plant leaves and woody cotton and cotton vein shrinkage and high densities of the pest, causing purple leaf margins. In some cotton fields led to several branches of cotton plants are. This pest by dipping its trunk leaf tissue and sucking plant sap and enter the toxins in their saliva causes abnormalities in various organs such as the plant remained small and thick leaves, as well as shrink and the disappearance of chlorophyll has established that the sharp decline in the product (Monsef,1981,1986).Studies in Fars province on generation of green leafhopper population changes show that the pest of cotton in the cotton fields in the 7th generation. Hibernation leave as mature female on weed hosts in the winter. The peak insect activities are July and August. The pest has been detected in the Fars province under the name of *Empoasca decipience*. Such losses in the region of Fars province *Jacobiasca lybica* (Berg & Zanon) are identified (Monsef,1981).The study population dynamic and identify natural enemies leafhopper *Empoasca decedens* (Homoptera: Cicadellidae) and management and control of this pest in the poplar in Bakhtiari province over three years showed the insect, the spruce over a consecutive three generations, That peak generation months of June, July and August happen. Predator and parasite are the most difference natural enemies of pests, including the various stages of eggs, nymphs and adults under attack. Pest predators, including 8 species of spiders, two kinds of age of prey, a species of flies of the family Asilidae. It consists of a family of flies parasitoids most difference Pipunculidae, two species belong to the order Strepsiptera and eight parasitoid species belonging to the family of Aphelinidae, Dyrinidae, Encyrtidae, Eulophidae, Mymaridae, Scelionidae and was Trichogramatidae(Haghighian, *etal.,* 2008).The study population dynamics and spatial distribution pattern of *Bemisia tabaci* whitefly *Bemisia*

argentifolii and leafhopper *Empoasca decipiens* and showed the egg plant in Varamin the highest population, 4.89 whitefly per leaf in mid-June and mid-August was 6.69 per leaf leafhopper. All methods used in the diffusion index for whitefly that showed random distribution, the cumulative confirmed they were whitefly and leafhoppers(Kianpour, *etal.,* 1999).leafhoppers in addition to the direct damage to plants by sucking sap, some of them are virus diseases transmitted to the plants(Mathews,1989).The sensitivity of different plants in different regions is difference than the cotton green leafhopper. The pest in different areas of eggplant, potato and cotton is severely attack in Sudan (Rivnay,1962).African cotton fields before cotton leafhopper species *Empoasca fascialis* was under scrutiny by the scientific name of the species changed and today named *Jacobiasca lybica* (Mathews, 1989). Comparisons of sprayed and unsprayed cotton showed that leafhoppers significantly reduced numbers of fruit and yield. Total losses of the fruiting parts (square plus boll) were similar, ranging from 35 to 55% as well as cotton losses varied from 35 to 50%. Numbers of sucking insects (cotton aphid, whitefly and thrips). Cotton leafhoppers needs to be re-evaluated in cotton fields in Turkey and also other geographic regions which share similar ecological conditions and same leafhopper species(Atakan,2009).

Material and Methods:

1-To identify the species of leafhopper with field studies on weeds in cotton fields and margins leafhopper host using a sweep net samples and brush collected in 80% alcohol inside the glass tube to identify the Institution Research plant protection of Iran.

2**-**Study on the population dynamics of the pest cotton farms: For this purpose, the field survey at the beginning of the season, with regular visits every 7 to 10 days in the cotton fields of the selected 10 plants from each plant 3 leaves the choice and the different stages of the pest were counted and the tables for notes.

3- Investigation on the biology of the pest in laboratory conditions fields:

A- Laboratory conditions: For this the 5 pots containing plants cotton 4 to 8 leaf under the cages under controlled conditions of temperature and humidity (24 ± 1 ° C and 75 ± 5 %) 3 instar.

B- Field conditions: For this purpose in the field of cotton plants with close to 10 pieces of fabrics under the cages with dimensions of 1 × 1 × 1.5 m, 10 adult and nymphal stages of infestation vegetation is registered pesticides according to the study of the biology of temperature and humidity environment placed.

Results and Discussion:

Based on studies conducted during the two year results were presented as follows, four green leafhopper species of cotton in the cotton fields of Golestan province scientific names:1- *Asymmetrasca decedens* 2- *Psammotettix alienus* 3- *Emposca decipiens* 4- *Jacobiasca lybica* .

The dominant species on cotton pest in the area have been identified *Asymmetrasca decedens*. Activity of pest in cotton fields by feeding on the sap of the host plant, causing shrinkage in the margin of the leaf veins and Stiff leaves and appears as purple. The peak activity of pests in cotton fields from early June until the first half of September in Gorgan on average temperature 27-30 ° C and average relative humidity of 57-65 percent until the end of the season in the cotton fields of activity(Fig.1,2). Studies in Fars province on generation of green leafhopper population changes show that the pest of cotton in the cotton fields in the 7th generation. Hibernation leave as mature female on weed hosts in the winter. The peak insect activities are July and August(Monsef,1981,1986).The leafhoppers *A. decedens* and *Empoasca decipiens* have only recently become significant pests of cotton in Turkey (Atakan,2009).

The main important cultivated host plants of this pest are cotton, potato, faba bean, rapeseed, soybean and cucurbit and its wild hosts are black night shade, pigweed, and mallow and goose weeds.

Damage by adult and nymphs feed on the sap is done and lay their eggs inside the host plant's tissue and then the insect nymphs feed on the sap of the host plant with their lap.

Important natural enemies of the pest from the bug of hunter *Nabis capsiformis* (Ger.) Family Nabidae and bugs of the predator *Orius niger* (Wolf.) and *O. minutus* (L.) have been identified from family Anthocoridae that green leafhopper nymphs feed the cotton and the high density of the predators in cotton fields can play an important role in reducing the pest population.

Biological pest in temperature 24 ± 1 ° C and a relative humidity of 75 ± 5 % of the show during the short summer generations 25- 35 days. Leafhoppers females lay their eggs individually around their main and secondary veins. Eggs hatching 7- 9 days after and nymphs your body slowly through the leaf epidermis tissue removed and a molt into adult are five times and shells remain leaves behind. During the period 10 to 15 days, nymphal and adult during the period 8 to 11 days. 5 to 6 generations of this pest in cotton fields (Table 1).

Table 1. Determine the green leafhopper biology *Asymmetrasca decedens* cotton under Laboratory conditions (24 ± 1 ° C and RH. 75 ± 5 %) and Fields conditions

Fields Con.				Laboratory Con.				Sources
S.D	Min.	Ave.	Max.	S.D	Min.	Ave.	Max.	Life stage
0.834	7	7.91	9	0.531	7	7.62	8	Hatching eggs(days)
2.061	10	13.47	15	0.763	11	12.38	14	Nymphal(days)
1.241	8	9.49	11	0.837	9	9.47	10	Longitudinal of adults(days)

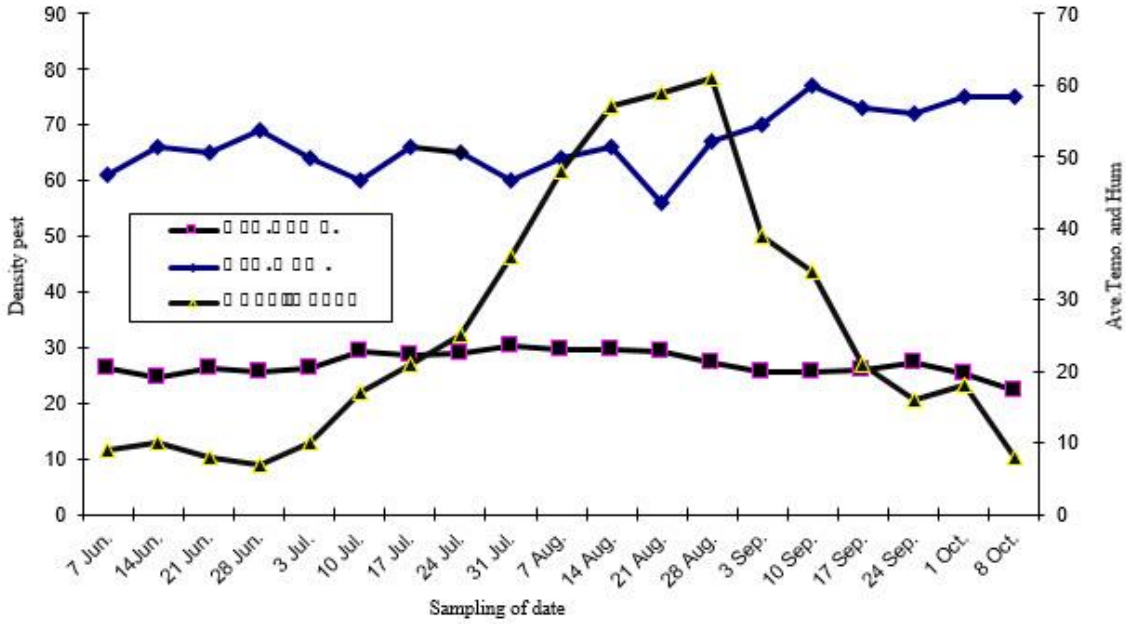

Figure 1. Population dynamic of *Asymmetrasca decedens* in the cotton fields Golestan province 2014 year

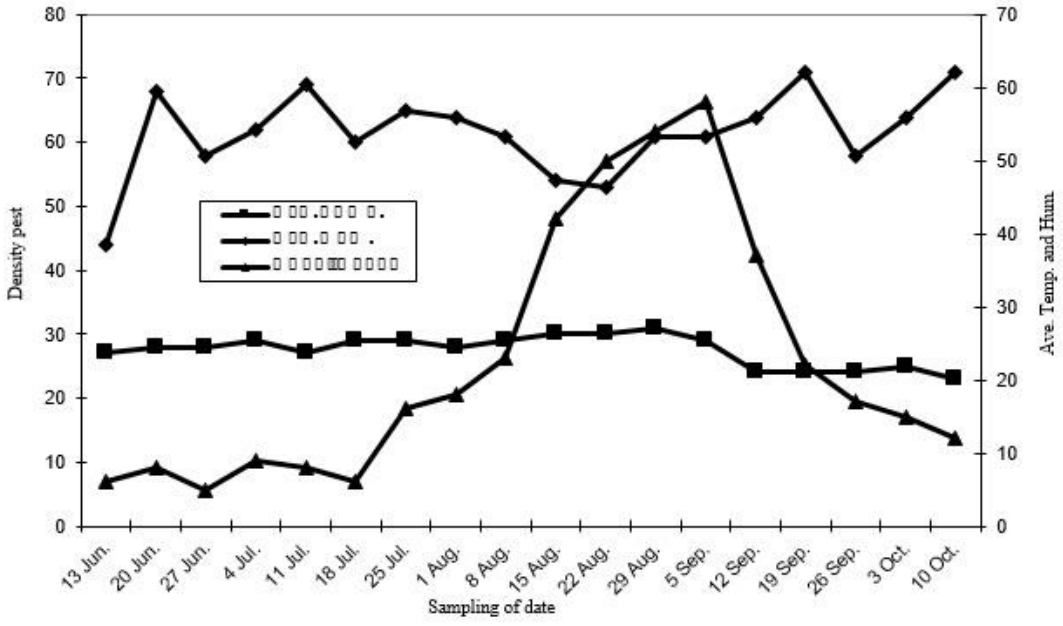

Fig 2- Population dynamic of Asymmetrasca decedens in the field's cotton Golestan province 2015 year.

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