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RESEARCH ARTICLE

IMPACT OF ABIOTIC FACTORS ON SEASONAL INCIDENCE OF SUCKING PESTS IN TRANSGENIC COTTON ECOSYSTEM

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ABSTRACT

Studies was carried out to investigate impact of abiotic factors on seasonal incidence of sucking pests of transgenic cotton viz., jassid (*Amrasca biguttula biguttula* Ishida), whitefly (*Bemisia tabaci* Gennadius) and thrip, (*Thrips tabaci* Lindeman), under unprotected condition. The results of the field study revealed that all the sucking pests first appeared in first week of July (27th standard week), but jassid remained active till third week of October (42th standard week), white fly population was observed till last week of October (43th standard week) and thrips was observed till third week of September (38th standard week) on Bt cotton. The peak population of jassid, whitefly and thrips were 2.33, 27.07 and 51.0 per three leaves in 34th standard week for jassid, 33th Standard week for whitefly and 35th Standard week for thrips, respectively. After that the population of sucking pests declined gradually. Jassid disappeared in last week of October (43th standard week) and thrips disappeared in last week of September (39th standard week) but whitefly was observed till last week of October (43th standard week). The correlation study revealed that the mean temperature had positive and significant correlation with the population of jassid, whitefly. In the present investigation it was also found that relative humidity (%) and rainfall had no significant role on jassid, whitefly and thrips population however the trend was positive for all the factors except for mean relative humidity for whitefly, which was negatively correlated.

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INTRODUCTION

Cotton enjoys a predominant position among all cash crops in india and has retained its unique fame as “king of fibres” and “white gold” because of its higher economical value among all cash crop of india. The development of Bt cotton containing a genetically introgressed endotoxin gene from the gram negative soil bacteria (*Bacillus thuringiensis* Hubner) represents a significant technological land mark in the global cotton research. India adopted this technology in 2002-03. Last few decades bollworm attack on cotton was a serious problem but, with the introduction of Bt varieties of cotton this problem has been solved to some extent and a significant change in cropping scheme in the cotton growing areas has been observed (Ahsan&Altaf, 2009). But the problem of sucking insect pests attack is remained unsolved still now. Among them jassid (*Amrasca biguttula biguttula* Ishida), whitefly (*Bemisia tabaci* Gennadius) and thrip, (*Thrips tabaci* Lindeman) occupy major pest status and cause considerable damage in Bt cotton. Due to variation in agro climatic conditions of different regions, these insect pests show varying trends in their incidence and also in nature and extent of damage to the crop. Besides, some known and unknown factors also play a key role in determining the incidence and dominance of these insect pests. Hence, a region oriented study is necessary, as it would help in combating the problem and boosting up the production. Information on seasonal

activity of sucking pests on Bt cotton helps to take up effective management strategies. Keeping this in view present study was undertaken.

MATERIALS AND METHODS

A field experiment was conducted at Agriculture Research Station, Sri Ganganagar under unprotected conditions to study the seasonal abundance pattern of sucking insect pests in popularly grown Bt cotton variety, RCH-134 Bt (BG-I). The experiment was conducted in Randomized Block design with two replications at the Agriculture Research Station, Sri Ganganagar (Raj.). The crop was raised in 20 m x 20 m plots with 100 cm row to row and 60 cm plant to plant distance. To observe the seasonal incidence of jassid, whitefly and thrips, general observation were done weekly interval in the early hours between 6.30 am to 8.30 am, when most of the insects are less active. After the germination period of 30 days, 5 plants selected and tagged for recording the sucking pests population. The population were recorded on three leaves, on each of top, middle and bottom. Weekly data collected on population count of various sucking insect pests for the season, were pooled and presented in table forms. The weekly pooled data on jassid, whitefly and thrips were subjected to correlation studies with weather parameters viz. mean temperature, mean percent relative humidity and rainfall. Simple correlation was worked out between insect-pest population and abiotic factors using the following formula:

$$r_{xy} = \frac{\sum XY \frac{\sum X \sum Y}{n}}{\sqrt{\left(\sum X^2 - \frac{(\sum X)^2}{n}\right) \left(\sum Y^2 - \frac{(\sum Y)^2}{n}\right)}}$$

Where,

r_{xy} = simple correlation coefficient

x= variable i.e. abiotic component

y = variable i.e. mean number of insect pests

n= number of observations

Table-1 Seasonal incidence of insect- pests on RCH-134 Bt (BG-I) in relation to abiotic factors

Month	Standard week	Sucking pests/3 leaves			Mean Temp (°C)	Mean R.H. (%)	Rain fall (mm)
		Jassid	Whitefly	Thrips			
July	27	0.85	14.3	7.35	37	43	5.2
	28	0.92	18.7	9.5	33.25	65.80	68.9
	29	1.17	19.3	11.87	34	60.65	0.6
	30	1.27	20.2	13.27	35.6	58.95	0
	31	1.4	12.87	20.2	34.95	54.10	0
Aug.	32	1.8	19.87	31.07	32.6	67.65	0.6
	33	2.13	27.07	42.47	32.60	66.80	0.1
	34	2.33	24.53	32.27	32.40	72.45	1
	35	1.73	0.4	51.0	30.85	80.85	32.1
	36	1.87	14.8	26.6	29.15	83.80	154.6
Sep.	37	1.87	13.2	20.33	30.85	78.80	26.3
	38	1.73	9.93	12.2	28.9	74.80	4.3
	39	1.07	4.07	0	29.80	63.60	0
	40	0.73	4.53	0	28.255	60.36	0
Oct.	41	0.4	2.53	0	25.31	66.72	0
	42	0.2	1.2	0	23.40	59.86	0
	43	0	0.47	0	18.845	76.07	4.5

Table-2 Correlation between key abiotic factors and Sucking insect pests population

Sucking pests	Mean Temp (°C)	Mean R.H. (%)	Rainfall (mm)
Jassid	0.5649*	0.3686	0.2228
Whitefly	0.7023*	-0.1227	0.0826
Thrips	0.4013	0.4255	0.2204

* Significant at 5% level

RESULTS AND DISCUSSION

The results (Table- 1) showed that all the sucking pests first appeared in first week of July (27th standard week), but jassid remained active till third week of October (42th standard week), white fly population was observed till last week of October (43th standard week) and thrips was observed till third week of September (38th standard week) on Bt cotton. The peak population of jassid, whitefly and thrips were 2.33, 27.07 and 51.0 per three leaves in 34th standard week for jassid, 33th Standard week for whitefly and 35th Standard week for thrips, respectively. After that the population of sucking pests declined gradually. Jassid disappeared in last week of October (43th standard week) and thrips disappeared in last week of September (39th standard week) but whitefly was observed till last week of October (43th standard week). The correlation study (Table-2) revealed that the mean temperature had positive and significant correlation with the population of jassid, whitefly. In the present investigation it was also found that relative humidity (%) and rainfall had no significant role on jassid, whitefly and thrips population however the trend was positive for all the factors except for mean relative humidity for whitefly, which was negatively correlated.

These findings corroborated to the findings of Aggarwal *et al.* (2007) and Kirar *et al.* (2013) who observed peak infestation of jassid and thrips during the month of August. The present results are in agreement with those of Chundawat & Ameta (2011), Shahid *et al.* (2012), Netam *et al.* (2013) and Meena *et al.* (2013) also reported maximum population of whitefly in August and September.

References

- Aggarwal N, Brar D S and Butter G S (2007). Evaluation of Bt and non-Bt versions of two cotton hybrids under different spacing against sucking insect-pest and natural enemies. *J Cotton Res Dev*, 21 : 106-110
- Ahsan, R. and Altaf, Z. (2009). Development adoption and performance of Bt cotton in Pakistan: A review. *Pak. J. Agri. Sci.*, 22, 73-85.
- Chundawat A S and Ameta O P (2011). Incidence of sucking insect pests of okra in relation to weather parameters. *Indian J ApplEntomol*, 25 (1) : 36-38.
- Kirar V S, Ameta O P, Swaminathan R and Upadhyay B (2013). Seasonal incidence of major sap sucking pests of cotton. *Indian J ApplEntomol*, 27 (1) : 1-4.
- Meena R S, Ameta O P and Meena B L (2013). Population dynamics of sucking pests and their correlation with weather parameters in *chillicapsicum annum* L. *Crop. The Bioscan*, 8 (1) : 177-180.
- Netam H K, Gupta D R and Soni S (2013). Seasonal incidence of insect pests and their biocontrol agents on Soybean. *IOSR J Agric vet sci*, 2 (2) : 07-11
- Shahid M R, Farroq J, Mohmmod A, Ilahi F, Riaz M, Shakeel A, Mag I V P, Farooz A (2012). Seasonal occurrence of sucking insect pest in cotton ecosystem of Panjab Pakistan. *Advances in agriculture and Botanic, International Journal of the Bio Flux society*, 4 (1) : 26-30.
