



SCREENING OF Bt COTTON GENOTYPES AGAINST COTTON JASSID, *AMRASCA BIGUTTULA BIGUTTULA* (ISHIDA) UNDER FIELD CONDITION

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ABSTRACT

The experiment on screening of new Bt genotypes for their reaction to Jassid *Amrasca biguttula biguttula* was conducted during the Kharif season of 2010 and 2011 at Agricultural Research Station, Sri Ganganagar. A total of 43 genotypes including one hybrid check, one Bt check and one variety check were selected for present study. The interactions of cotton genotypes were grouped based on the mean and standard deviation. Out of 43 Bt cotton genotypes including one hybrid check, one Bt check and one variety check, 14 genotypes namely JKCH-1947, MRC-7081, ANKUR-2227, SRCH-999, VBCH-1548, KSCH-213, ANKUR 2575, DPC-3083, RS-2013(v. Check), TULASI-224, ZCH-1102, GBCH-95, SRCH-888 and MRC-7091 in which jassid population ranged from 1.33 to 1.80 jassid/ 3 leaves ,and were found at par and significantly superior to rest of the genotypes.

Key words : Screening, Bt cotton, Jassid *Amrasca biguttula biguttula* , Resistance.

INTRODUCTION

Cotton, which is one of the main commercial crops of India, is susceptible to the attack of numerous insect pests. India ranks first in the global scenario with about 33 per cent of the world's cotton area but with regard to production it ranks second to China with 35.30 million bales of cotton lint with an average productivity of 491 kg per ha (Anonymous, 2003). In India cotton harbours about 162 insect pest species and the monetary value of yield losses due to insect pests has been estimated to be Rs 2,87,000 million annually (Dhawan et al, 2008). The extent of losses caused by sucking pests, bollworms and both sucking pests and bollworms have been worked out to be 12, 44, and 52 per cent, respectively, (Dhawan et al, 1988). Sucking pests have become quite serious from seedling to harvesting stage. Among the sap feeders, jassid, *Amrasca biguttula biguttula* (Ishida) is one of the major pests responsible for limiting cotton production in the State (AICCIP 2008). Even though the Bt cotton hybrids are resistant to bollworms, most of them are succumbent to the sucking pests scourge. Identification and use of tolerant / resistant cultivar seem pertinent and relevant for being ecofriendly and cost effective. Therefore the present

investigation was carried out with the aim of identifying resistant sources of Bt cotton against jassid, *Amrasca biguttula biguttula*.

MATERIALS AND METHODS

The experiment on screening of new Bt genotypes for their reaction to jassid, *Amrasca biguttula biguttula* (Ishida) was conducted during Kharif season 2010 and 2011 at Agricultural Research Station, Sri Ganganagar. A total of 43 genotypes including one hybrid check, one Bt check and one variety check were selected for present study. These genotypes were procured from All India Cotton Improvement Project, Sri Ganganagar. The whole experiment was conducted under irrigated conditions. For comparative performance of different Bt genotypes, season long observations were recorded on the Jassid population. The data have been presented at the respective day of observation for each recorded parameter and average of all observations as seasonal mean. The average seasonal means were considered for pooled analysis of two years. Observations on the Jassid population were recorded on three randomly selected plants. Population counts of Jassid were made on the lower surface of three leaves (one each from upper, middle and lower plant canopy) of each of the three randomly selected plants per plot. All observations were done weekly starting from early July until harvesting of crops. Later the population was averaged to present as number per three leaves. All the Bt cotton genotypes were raised under unprotected conditions. All agronomical practices were followed from time to time for maintaining healthy crops as per the recommendation of package and practices of Zone I b.

RESULTS AND DISCUSSION

Out of 43 genotypes screened for two years, 14 genotypes namely, JKCH-1947, MRC-7081, ANKUR-2227, SRCH-999, VBCH-1548, KSCH-213, ANKUR 2575, DPC-3083, RS-2013 (v.Check), TULASI-224, ZCH-1102, GBCH-95, SRCH-888 and MRC-7091, registering jassid population ranged from 1.33 to 1.80 jassid/ 3 leaves were found at par to each other and significantly superior to checks and the rest of the genotypes. However, the present results contradict with findings of Radhika *et al.* (2004) and Abro *et al.* (2004), who reported that the incidence of sucking pests was higher in Bt hybrids than their Non Bt counterparts. In genotype JKCH 1947, 1.33 jassid/ 3 leaves was recorded in the present investigation, which was significantly lower against check genotypes. These findings do not tally with the work conducted at AICCIP centres Faridkot, Ludhiana and Hisar, where Jassid population recorded was higher than checks in this genotype.

REFERENCES

Abro G H, Syed T S, Tunio G M and Khuhro M A (2004). Performance of transgenic Bt cotton against insect pest infestation. *Biotechnology* 3 (1) : 75-81.

AICCP (2008). All India Coordinated Cotton Improvement Project. Annual Progress Report 2007-08. Agricultural Research Station (Rajasthan Agricultural University), Sri Ganganagar, Rajasthan.

Anonymous (2003) Directorate of Economics and Statistics, Department of Agriculture and Cooperation, New Delhi, India.

Dhawan A K, Simwat G S and Sidhu A S (1988). Field evaluation of Monocrotophos for the control of sucking pests on cotton. *Pesticides* 22(6), 25-28.

Dhawan A K, Shera P S, Jindal V and Aggarwal N (2008). Changing scenario of cotton insect pests and their management strategies. PP 81-99. In: Cotton in Punjab. Dept. Plant Breeding, Genetics and Biotechnology, Punjab Agril. Univ., Ludhiana. pp. 109.

Radhika P, Sudhakar K, Basha Mohiddin S and Prasada Rao G M V (2004). Relative incidence of pest complex on Bt and Non Bt cotton hybrids under protected and unprotected conditions. In: Proceedings of National symposium on “Strategies for Sustainable Cotton Production- A Global vision- 3, Crop Protection” November 23-25, USA, Dharwad: 136-138.

Table-1. Screening of different Bt cotton genotypes against Jassid, *Amrasca biguttula biguttula* (Ishida) During Kharif of the Year 2010 and 2011 (pooled data of two years)

S. N.	Genotypes	Jassid/3 leaves		
		2010	2011	Mean
1	SRCH-666 BG II	2.00* (1.41)**	2.24* (1.50)**	2.12# (1.45)**
2	SRCH-999 BG II	1.47 (1.21)	1.69 (1.30)	1.58 (1.26)
3	SRCH-888 BG II	1.85 (1.36)	1.72 (1.31)	1.78 (1.33)
4	Super- R111 BG II	1.90 (1.38)	1.85 (1.35)	1.88 (1.37)
5	ZCH-904 Rajath BG II	1.75 (1.32)	2.01 (1.42)	1.88 (1.37)
6	ZCH-1101 BG II	1.75 (1.32)	1.90 (1.38)	1.83 (1.35)
7	ZCH-1102 BG II	1.66 (1.28)	1.89 (1.37)	1.78 (1.33)

S. N.	Genotypes	Jassid/3 leaves		
		2010	2011	Mean
8	GBCH-95 BG II	1.66 (1.29)	1.91 (1.38)	1.78 (1.33)
9	GBCH-85 BG II	1.99 (1.41)	2.30 (1.51)	2.15 (1.46)
10	GK-220 BG II	2.67 (1.63)	2.78 (1.67)	2.72 (1.65)
11	Ankur-2227 BG II	1.56 (1.25)	1.54 (1.24)	1.55 (1.24)
12	Ankur-2575 BG II	1.56 (1.25)	1.81 (1.34)	1.69 (1.30)
13	Ankur-3244 BG II	1.71 (1.31)	1.96 (1.46)	1.83 (1.35)
14	W. Kasturi-11 BG II	2.41 (1.55)	2.76 (1.66)	2.58 (1.61)
15	W. Kasturi-33 BG II	2.28 (1.51)	2.20 (1.48)	2.25 (1.50)
16	RCH-773 BG II	2.29 (1.51)	2.55 (1.60)	2.42 (1.55)
17	RCH-776 BG II	1.90 (1.38)	2.19 (1.48)	2.04 (1.43)
18	RCH-791 BG II	1.85 (1.36)	2.12 (1.46)	1.99 (1.41)
19	DPC-3083 BG II	1.76 (1.33)	1.69 (1.30)	1.72 (1.31)
20	DPC-3081 BG II	1.75 (1.32)	2.02 (1.42)	1.88 (1.37)
21	DPC-3091 BG II	2.23 (1.49)	2.51 (1.58)	2.37 (1.54)
22	DPC-3101 BG II	2.32 (1.52)	2.39 (1.55)	2.36 (1.53)
23	Tulasi-224 BG II	1.61 (1.27)	1.85 (1.36)	1.73 (1.32)
24	JKCH -8935 BG II	1.99 (1.41)	2.29 (1.51)	2.14 (1.46)
25	JKCH-1947 BG II	1.32 (1.14)	1.34 (1.16)	1.33 (1.15)
26	JK Tarzan BG II	2.37 (1.54)	2.74 (1.65)	2.56 (1.60)
27	NCS-6666 BG II	1.95 (1.40)	2.25 (1.50)	2.10 (1.45)
28	NCS-2223 BG II	2.09 (1.45)	1.90 (1.38)	2.00 (1.41)
29	KSCH-211 BG II	2.00 (1.41)	2.31 (1.52)	2.15 (1.46)
30	KSCH-213 BG II	1.52 (1.23)	1.75 (1.32)	1.63 (1.28)
31	PCH-556 BG II	1.85 (1.35)	2.14 (1.45)	1.99 (1.40)
32	PCH-5678 BG II	2.13 (1.46)	2.07 (1.44)	2.10 (1.45)
33	PRCH-709 BG II	1.95 (1.40)	2.00 (1.41)	1.97 (1.40)
34	PRCH-7776 BG II	2.00 (1.41)	2.31 (1.51)	2.15 (1.46)
35	MRC-7081 BG II	1.42 (1.19)	1.63 (1.28)	1.52 (1.23)

S. N.	Genotypes	Jassid/3 leaves		
		2010	2011	Mean
36	MRC-7017 Gold BG II	1.80 (1.34)	2.08 (1.44)	1.94 (1.39)
37	MRC-7091 BG II	1.66 (1.28)	1.93 (1.38)	1.80 (1.33)
38	MRC 7017 + BG II	1.76 (1.33)	2.02 (1.42)	1.89 (1.37)
39	VBCH-1548 BG II	1.47 (1.21)	1.69 (1.30)	1.58 (1.26)
40	VBCH-1545 BG II	2.04 (1.42)	2.37 (1.53)	2.21 (1.48)
41	RS 2013(V. Check)	1.61 (1.26)	1.87 (1.36)	1.74 (1.31)
42	RSHH 238 (Hy. Check)	1.76 (1.32)	2.02 (1.42)	1.89 (1.37)
43	MRC 7017 (Bt Check)	1.90 (1.38)	2.19 (1.48)	2.04 (1.43)
SEM		0.06	0.07	0.06
CD(5%)		0.16	0.09	0.18
CV%		6.01	6.69	6.35

* Average of two replications.

** Figures in parentheses are square root values.

Pooled mean of two years