

# Evaluation of Bt cotton hybrids for fibre quality under rainfed conditions

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Ninety seven Bt Cotton hybrids were evaluated along with two Bt and two non Bt check hybrids under rainfed conditions at AICCIP, Cotton Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (M.S.) during *Kharif* 2008-2009. Results revealed that, the minimum and maximum range for fibre length was found to be 23.2 mm to 35.7 mm, strength was observed between 15.4 g/tex (low) to 27.0 g/tex (strong), whereas micronaire value ranged between very fine (2.2 µg/inch) to very coarse (4.5 µg/inch). The uniformity ratio for all the hybrids were recorded in the range of 43 to 53 per cent. The highest ginning outturn was obtained from the hybrid UPLHH-2Bt (36.5%). The desirable hybrids in respect of fibre quality were, MRC-7918 BG II, MARGO Bt and SANDIP Bt during present investigation. However it needs further confirmation on multilocation basis.

**Key words :** Fiber quality, Bt Cotton and rainfed

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## INTRODUCTION

India rank first in area and second for production after China in cotton. Cotton crop is extensively cultivated under rainfed conditions in Vidarbha region of Maharashtra state. Cotton is a leading fibre crop and second most important oilseed crop in the world (Rajendran *et al.*, 2005). At present genetically modified cotton is commonly accepted by Indian farmers. Out of 110.0 lakh ha area, 88 per cent area (96.14 lakh ha) is occupied by Bt cotton hybrids (Anonymous, 2011). Cotton is one of the most important fibre crop and back bone of textile industry of India. It alone accounts for 70 per cent of total fibre consumption in textile sector with approximately of 38 per cent of the country's export. Cotton crop is basically cultivated for its fibre which is used unmiserably as textile raw material. Cotton seed is crushed to get its oil for human consumption and left out cakes used as a cattle feed. Millions of people depend on cotton cultivation, trade, transportation, ginning and processing for their livelihood (Pole *et al.*, 2008). The price of cotton is governed by fibre length, fineness along with higher ginning outturn are the most important quality parameters (Kumar *et al.*, 2003). Therefore, a study was undertaken to identify few suitable region specific hybrids having good ginning potential coupled with superior fibre

quality characteristics under rainfed condition of Vidarbha.

## RESEARCH METHODOLOGY

A field experiment was conducted under TMC MM I/ 1.4 project at Cotton Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, (M.S.) during *Kharif* 2008-09 in randomized block design with two replications and 102 Bt cotton hybrids as a treatments. Ninety seven Bt cotton hybrids from various companies were evaluated for ginning outturn and fibre quality parameters, along with two Bt and two non Bt cotton hybrid as a check under rainfed condition. These hybrids were sown on dated 3<sup>rd</sup> July 2008, with the spacing of 90 × 60 cm (R×P). The plot size was 6.00 × 3.60 m. The recommended package practices were followed to raise the good crop, Three foliar sprays of recommended insecticides (*i.e.* each one spray of dimethoate 30 EC @ 10 ml, acetamiprid 20 SP @ 1.5 g and imidacloprid 17.8 SL @ 3 ml in 10 litre of water) were undertaken during peak infestation period against sucking pests. However, no plant protection measures were undertaken against bollworms. The data for yield contributing character *viz.*, sympodia, monopodia and number of bolls were recorded from randomly selected five plants, whereas yield observation were taken on net plot basis. The seed cotton

**Table 1 : Fibre properties of different Bt Cotton hybrids under rainfed condition**

Sr. No.	Name of entry	2.5% SL length (mm)	Uniformity ratio (%)	Fineness micronaire ( $\mu\text{g}/\text{inch}$ )	Bundle strength (g/tex)	Ginning outturn
1.	SIGMA Bt	30.0	48	3.6	20.5	33.70
2.	DYNA Bt	29.8	46	3.1	18.3	35.00
3.	ACE Bt	29.6	46	2.9	21.8	35.00
4.	HERO Bt	28.5	51	3.8	20.7	33.95
5.	GRACE Bt	24.5	52	3.0	20.9	36.00
6.	CASH Bt	29.0	49	2.7	21.0	35.00
7.	VICH-5 Bt	29.1	49	3.7	19.7	33.25
8.	VICH-9 Bt	27.0	49	2.5	20.3	36.00
9.	VICH-15 Bt	27.2	51	3.6	21.1	34.00
10.	BULLET Bt	28.6	51	4.1	21.0	34.80
11.	ENCOUNTER Bt	30.3	50	3.3	21.3	34.00
12.	GK-205 Bt	26.4	49	3.5	20.4	33.75
13.	PKV HY-2 (Ch)	26.2	51	3.3	20.1	35.00
14.	TCHH-4 Bt	28.6	51	3.4	20.5	33.50
15.	TCHH-9 Bt	29.6	49	4.4	21.3	33.75
16.	TCHH-117 Bt	28.6	50	3.3	19.1	35.00
17.	MRC-6301 Bt	29.9	50	3.5	21.4	33.55
18.	BUNNY Bt (Ch)	31.2	50	3.3	21.7	34.25
19.	MALLIKA Bt	28.8	51	3.7	20.8	35.30
20.	SUPER BUNNY Bt	31.7	51	3.5	22.3	34.25
21.	RANJIT Bt	26.1	48	2.8	19.3	36.25
22.	KANAK Bt	29.6	49	2.9	20.8	35.50
23.	SUPER MALLIKA Bt	29.0	50	3.5	25.0	33.25
24.	ANKUR-651 Bt	28.4	50	3.2	17.8	36.05
25.	JAI Bt	29.8	50	3.4	20.6	33.50
26.	AKKA Bt	31.7	51	3.7	23.8	34.00
27.	ANKUR-3032 Bt	30.5	51	3.8	22.8	34.25
28.	ABCH-1165 Bt	27.4	47	3.1	19.5	35.00
29.	ABCH-1220 Bt	31.6	43	2.3	19.2	35.25
30.	ABCH-1065 Bt	25.2	51	2.4	18.4	36.25
31.	JKCH-99 Bt	24.8	51	3.7	18.8	35.25
32.	JKCH-666 Bt	29.0	48	3.0	18.1	36.25
33.	JK INDRA Bt	26.8	52	3.7	18.8	34.75
34.	JKCH-226 Bt	23.9	49	2.9	20.4	35.25
35.	PRCH-31 Bt	25.3	50	2.9	17.7	36.25
36.	PRCH-504 Bt	30.4	48	3.5	19.4	33.25
37.	PRCH-102 Bt	31.5	48	3.2	21.5	34.25
38.	KDCHH-9632 Bt	23.8	52	3.3	20.7	35.00
39.	KDCHH-786 Bt	27.5	50	3.4	18.1	34.75
40.	KDCHH-9821 Bt	25.2	53	4.5	18.3	33.25
41.	KDCHH-9810 Bt	26.0	51	4.0	19.3	34.25
42.	PCH-205 Bt	28.8	50	3.6	20.3	33.25
43.	PCH-2171 Bt	26.5	51	2.8	18.3	36.00
44.	PCH-115 Bt	24.4	50	3.2	17.1	34.75
45.	PCH-930 Bt	29.2	49	3.6	19.6	34.25
46.	PCH-923 Bt	27.3	50	3.1	20.2	34.50
47.	RCH-118 Bt	27.0	46	2.9	15.4	33.75
48.	RCH-377 Bt	28.2	48	3.2	22.5	33.25
49.	RCH-144 Bt	24.9	49	3.1	18.5	36.15
50.	RCH-386 Bt	28.3	45	2.8	22.5	34.00

Table 1 Contd.....

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51.	RCH-2 Bt (Ch)	27.8	48	3.7	19.2	34.00
52.	RCH-138 Bt	26.5	51	2.8	21.5	35.50
53.	BRAHMA Bt	30.3	49	3.7	20.5	34.00
54.	SP-499 Bt	26.1	51	4.4	18.7	34.25
55.	SP-504 Bt	27.6	49	3.2	20.3	34.25
56.	SP-923 Bt	25.6	50	3.1	21.9	35.00
57.	SP-503 Bt	29.9	48	4.0	23.0	33.50
58.	NCEH-14 Bt	29.4	50	3.5	23.5	34.50
59.	NCEH-21 Bt	27.6	49	4.1	22.5	33.75
60.	NCEH-3 R Bt	28.3	51	3.3	22.1	34.00
61.	NCEH-34 Bt	29.2	49	2.7	23.1	33.75
62.	UPLHH-2 Bt	29.2	50	4.1	21.6	36.50
63.	RATNA Bt	30.0	47	3.2	23.7	34.75
64.	SANDIP Bt	31.1	47	2.8	26.2	35.00
65.	SIDDU Bt	28.7	51	3.4	23.8	34.75
66.	DHRUV-Bt	27.6	50	3.4	24.5	33.75
67.	ACH-155-1 Bt	25.8	52	3.5	20.8	34.00
68.	ACH-21-1 Bt	29.2	50	2.9	24.0	33.00
69.	VASANT Bt	28.3	49	3.0	20.0	33.75
70.	MARGO Bt	30.0	51	3.2	26.3	34.25
71.	GABBAR Bt	30.5	48	2.9	22.3	34.50
72.	NHH-44 (Ch)	24.6	52	3.5	16.6	36.00
73.	SIGMA BG II	29.2	47	3.2	20.7	34.50
74.	BOND BG II	27.3	48	2.9	17.3	35.00
75.	DYNA BG II	29.4	52	3.3	20.7	33.50
76.	VICH-15 BG II	27.7	51	4.1	18.1	34.75
77.	ENCOUNTER BG II	28.7	49	3.0	20.7	33.25
78.	TCHH-4 BG II	30.3	47	4.2	21.5	34.25
79.	TCHH-9 BG II	31.0	51	3.7	21.0	33.75
80.	MRC-7301 BG II	30.7	52	3.5	24.4	33.25
81.	MRC-7326 BG II	23.2	51	2.2	16.9	34.00
82.	MRC-7347 BG II	29.2	51	3.9	20.7	34.75
83.	MRC-7351 BG II	29.6	50	4.0	19.3	34.25
84.	MRC-7918 BG II	35.7	48	2.6	27.0	33.25
85.	BUNNY BG II	30.7	50	3.3	19.0	34.25
86.	MALLIKA BG II	29.2	50	3.3	19.9	33.75
87.	AKKA BG II	30.8	49	3.2	20.3	35.50
88.	PRCH -504 BG II	26.8	49	2.5	16.3	34.50
89.	PRCH-505 BG II	29.3	50	3.6	21.2	34.00
90.	KDCHH-9632 BG II	25.9	51	3.5	20.2	35.75
91.	KDCHH-441 BG II	28.5	51	3.7	18.9	33.75
92.	KDCHH-621 BG II	29.6	50	3.4	24.4	36.15
93.	PCH-205 BG II	27.6	50	3.7	19.4	33.75
94.	RCH-2 BG II	29.3	51	3.9	19.3	34.25
95.	RCH-515 BG II	26.3	49	2.5	19.3	35.00
96.	RCH-578 BG II	30.5	51	3.7	21.7	35.30
97.	RCH-584 BG II	32.1	46	3.0	20.6	34.25
98.	ATAL BG II	31.9	48	3.7	21.9	33.75
99.	SP-1037 BG II	28.0	47	3.3	21.3	36.00
100.	DHOOM BG II	25.8	48	2.5	17.0	35.25
101.	ACH-11-2 BG II	31.3	48	4.1	21.5	36.00

utilized for ginning and fibre properties study was selected especially from second picking. For quality parameters, the samples were analyzed at CIRCOT, Nagpur (M.S.). The fibre quality characters namely, 2.5 per cent span length, uniformity ratio, fibre strength (g/tex), and micronaire ( $\mu\text{g}/\text{inch}$ ) were critically analyzed.

## RESEARCH FINDINGS AND ANALYSIS

The hybrids were evaluated for fibre quality characters and the results are presented in the Table 1. The highest value of 2.5 per cent span length was recorded by the hybrid MRC-7918 BG II (35.7 mm) followed by RCH-584 BG II (32.1 mm) and ATAL BG II (31.9 mm). In case of uniformity ratio the hybrids KDCHH-9821 Bt (53%) and MRC-7301 BG II, DYNA BG

II, ACH-155-1 Bt, KDCHH-9632 Bt, JKINDRA Bt, GRACE Bt and NHH-44 Non Bt found excellent for per cent uniformity. The fibre strength ranged from 15.4 to 27 (g/tex). Highest strength was achieved by the hybrid MRC-8918 BG II (27.0 g/tex), followed by MARGO Bt (26.3 g/tex) and SANDIP Bt (26.2 g/tex). The fibre fineness ranged from 2.2 to 4.5 ( $\mu\text{g}/\text{inch}$ ). The hybrids MRC-7326 BG II (2.2  $\mu\text{g}/\text{inch}$ ), ABCH-1220 Bt (2.3  $\mu\text{g}/\text{inch}$ ) and ABCH-1065 Bt (2.4  $\mu\text{g}/\text{inch}$ ), were having fine fibre. Regarding ginning outturn the hybrid UPLHH-2 Bt found best where as all the hybrids ranged in between 33.0 per cent to 36.5 per cent for ginning outturn. On over all basis the best hybrids in respect of fibre quality were observed to be, MRC-7918 BG II, MARGO Bt and SANDIP Bt. Present findings are in conformity with the finding of Jain (1996), Patil *et al.* (1988) and Kumar *et al.* (2003).

## LITERATURE CITED

- Anonmyous (2011). Annual Report of Cotton (AICCIP) CICR Regional Station, Coimbtore, pp. 96-102.
- Jain, S. (1996). Heterosis for fibre characters in intra and inter specific hybrids of cotton. *J. Cotton Res. Dev.*, **10** : 147-149.
- Kumar, Manoj, Chhabra, B.S. and Kumar, Ramesh (2003). Heterosis for seed cotton yield and fibre properties of cotton under multiple environments. *J. Maharashtra Agric. Univ.*, **28** : 277-280.
- Patil, F.B., Thombre, M.V., Shinde, Y.M. and Darade, R.S. (1988). Heterosis in fibre properties of cotton under multiple environments. *J. Maharashtra Agric. Univ.*, **13** : 277-280.
- Pole, S.P., Sedewad, S.M., Kamble, S.K. and Borgaonkar, S.B. (2008). Heterosis for seed cotton yield and yield components in upland cotton (*Gossypium hirsutum* L.). *J. Cotton Res. Dev.*, **22** : 139-142.
- Rajedran, T.P., Venugopalan, M.V. and Praharaj, C.S. (2005). Cotton research towards sufficiency to Indian textile industry. *Indian J. agric. Sci.*, **75** (11) : 699-708.


  
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