



## Agronomic Performance of Bt and Non Bt Cotton hybrids

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**An investigation on three Bt cotton hybrids was carried out for their agronomic performance with their counterparts non Bt hybrids at the Department of Cotton, Tamil Nadu Agricultural University, Coimbatore during winter season of 2007-2008 along with hybrid cotton *Savitha*. The results indicated that all the Bt entries recorded higher seed cotton yield than their non-Bt counterparts. Among the Bt hybrids, MECH 162 Bt recorded higher seed cotton yield than the other two Bt hybrids viz., MECH 184 and MECH 12 as well as their non Bt counterparts and the check *Savitha*.**

**Key words:** Cotton, Bt hybrids, seed cotton yield

Hybrid cotton contributes lion's share in cotton production basket of India and nearly 3.33 m ha is covered by hybrid cotton (Patel and Khadi, 2004). The increase in area under Bt cotton from 0.35 lakh hectare in 2001 to over 36.94 lakh hectares in 2007 is an indication of the acceptance of Bt cotton hybrids by the Indian cotton farmers (Anon, 2007). It is predicted that the increase in area under Bt cotton in the coming years will be in geometrical proportion leading to a total coverage of all the *hirsutum* cotton area of the country with Bt cotton hybrid. Bt cotton trials conducted at various places in India to know the yield potentiality of Bt as compared to Non-Bt have shown encouraging results and will be highly beneficial to the farmers (Khadi *et al.*, 2002).

### Materials and Methods

An investigation on three Bt cotton hybrids was carried out for their agronomic performances with their counterparts non Bt hybrids at the Department of Cotton, Tamil Nadu Agricultural University, Coimbatore during winter season of 2007-2008 along with hybrid cotton *Savitha*. The experiment was laid out in a randomized block design, replicated thrice. The soil of the experimental site was medium black soil with a nutrient status of 180 kg N (low), 10 kg P (low) and 230 kg K ha<sup>-1</sup> (low), pH 8.1, EC 0.28 dSm<sup>-1</sup> and organic carbon 0.42 per cent. The Bt cotton was sown at 90 x 60 cm spacing. The fertilizer dose followed was 90:45:45 kg NPK ha<sup>-1</sup> for Non BT and 120:60:60 NPK kg ha<sup>-1</sup> for BT. Half the dose of N and full dose of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O was applied as basal. Remaining half dose of N was applied in two splits one at 20 and the other at 60 DAS. Irrigation and other practices were commonly followed for all the entries as per the recommendations. The treatments were as follows.

T<sub>1</sub> MECH 162 Bt

T<sub>2</sub> MECH 184 Bt  
T<sub>3</sub> MECH 12 Bt  
T<sub>4</sub> MECH 162 NBt  
T<sub>5</sub> MECH 184 NBt  
T<sub>6</sub> MECH 12 NBt  
T<sub>7</sub> *Savitha*

### Results and Discussion

The Bt entries showed a clear differentiation in the growth attributes than the non Bt. Among the Bt, the highest leaf area, leaf area index and specific leaf weight was registered in MECH 162 Bt at all the stages and it also retained more functional leaf area even at 150 DAS. This has shown that longer leaf area duration and effective leaf area are available for growth and development of Bt cotton for functional productivity.

All the Bt entries recorded higher boll weight than their non-Bt counterparts. The higher number of bolls in Bt entries could be attributed to the lower square drop in Bt versions due to inherent genetic resistance. Boll maturity was exceptionally synchronous in MECH 184 Bt and all the bolls in most of the plants could be picked in one picking. In general Bt versions recorded higher yield than their corresponding non-Bt versions. Among the Bt versions, MECH 162 Bt recorded 105 % higher yield than non Bt, while it was 55 % and 9.3% in the case of MECH 184 and MECH 12, respectively. MECH 162 Bt recorded the highest seed cotton yield of 2454 kg ha<sup>-1</sup> which was 92 % higher than *Savitha* (1282 kg ha<sup>-1</sup>) followed by the hybrid MECH 184 Bt which recorded 2065 kg ha<sup>-1</sup> which was 61 % higher than *Savitha*. These results are in agreement with the reports of Khadi *et al.* (2002) who reported similar results of higher yield of Bt hybrids over Non Bt hybrids.

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**Table 1. Growth attributes of Bt and non-Bt cotton hybrids**

Hybrid	100 DAS			120 DAS			150 DAS		
	LA (cm <sup>2</sup> pt <sup>-1</sup> )	LAI	SLW (mg cm <sup>2</sup> )	LA (cm <sup>2</sup> pt <sup>-1</sup> )	LAI	SLW (mg cm <sup>2</sup> )	LA (cm <sup>2</sup> pt <sup>-1</sup> )	LAI	SLW (mg cm <sup>2</sup> )
MECH 162 Bt	11281	1.567	6.61	12950	1.799	6.15	9842	1.367	5.46
MECH 184 Bt	10145	1.409	7.44	12011	1.668	6.55	9128	1.268	6.01
MECH 12 Bt	10718	1.489	6.67	11700	1.625	6.49	8892	1.235	5.93
MECH 162 Non Bt	9817	1.364	6.27	10125	1.406	6.03	7695	1.069	5.27
MECH 184 Non Bt	9756	1.355	6.37	10021	1.392	6.25	7615	1.058	5.38
MECH 12 Non Bt	8396	1.166	6.51	9511	1.321	6.03	7237	1.005	5.56
Savitha (Variety)	16404	2.278	7.06	17570	2.440	6.55	13301	1.847	5.71
SEd	327	0.045	0.06	579	0.080	0.05	13.4	0.002	0.03
CD ( P = 0.05)	702	0.098	0.12	1243	0.173	0.11	28.7	0.004	0.06

**Table 2. Comparative performance of Bt and non-Bt cotton on yield attributes and seed cotton yield**

Hybrid	Symbodial Branches (No)	Bolls plant-1	Boll wt. (g)	Seed Cotton Yield (kg ha <sup>-1</sup> )
MECH 162 Bt	12.15	37	5.7	2454
MECH 184 Bt	11.30	38	7.3	2065
MECH 12 Bt	7.30	29	7.3	1863
MECH 162 Non Bt	6.30	24	5.4	1198
MECH 184 Non Bt	5.25	25	6.1	1329
MECH 12 Non Bt	6.90	22	6.8	1705
Savitha (Variety)	4.80	24	5.6	1282
SEd	2.03	3.6	0.28	181.6
CD (P = 0.05)	3.70	7.8	0.6	389.4

The results indicated the superiority of MECH 162 Bt over the other two Bt hybrids viz., MECH 184 and MECH 12 as well as their non Bt counterparts and the check Savitha.

#### References

Anonymous, 2007. AICCIP Annual Report, 2007-08, Central Institute for Cotton Research, Regional Station, Coimbatore

Khadi, B.M., Katagen, I.S., Kulkarni and Badigannavar, A.M. 2002. Evaluation of Bt cotton hybrids. In *Transitional tract of Karnataka*. Book of abstracts on National Seminar on Bt cotton with reference to India, held on 23<sup>rd</sup> May 2002 at UAS, Dharwad, p.87.

Patel, S.A. and Khadi, B.M. 2004. The impact of hybrid cotton on improvement of cotton production in India. Souvenir International Cotton Genome Institution ICG-2004. Workshop. Oct-10-13, Hyderabad, India.