

**Bt COTTON
EVALUATION REPORT**

**First year
(2 RCH H x B Hybrids)**

SOUTH ZONE

Submitted to
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

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Executive Summary

- ◆ INTERSPECIFIC (H x B) Bt hybrids with Bt Cry 1A (c) gene (Bollgard I), RCHB.708Bt, RCHB.702 Bt with check hybrids, DCH.32, TCHB.213 & DHB.105 were evaluated under BREEDING (protected) & PLANT PROTECTION (unprotected) condition.
- ◆ Under protected conditions, the test Bt hybrids were as much susceptible to jassids and thrips in this zone in 2004 season as the check hybrids in spite of appropriate pesticide spraying.
- ◆ The population of American bollworm was quite low during the 2004 season and there was not proper testing of these hybrids against this important pest.
- ◆ The Pink bollworm was noticed and the percent locule damage was quite high in Bt test hybrids. However, reduction in damage over check hybrids was seen. The protected plots of test hybrids also had similar open boll damage as much as that in check hybrids. The percent locule damage was very high under unprotected conditions in the test hybrids. The open boll damage, indicative of Pink bollworm damage was over 10% in the test hybrids when pesticide application against bollworms was not done.
- ◆ It was found that Spotted bollworm was observed in this zone in these hybrids. The Bt test hybrids had a mean value of 1.13 per 5 plants in comparison to more than a maximum of 3.68 in certain check hybrids.
- ◆ The pesticide spraying against sap sucking pests ranged between 1 and 3 in these test hybrids during 2004 season.
- ◆ Very high incidence of Grey mildew was noticed in Dharwad and Siruguppa and moderate incidence in Lam and Coimbatore (TNAU). The H x B hybrids viz., RCHB.708 Bt, RCHB.702 Bt and H x B checks were found to be equally susceptible to Grey mildew in Dharwad with the disease incidence ranging 30.35 percent on RCHB 702 Bt; 30.53 to 34.60 percent on RCHB.708 Bt; in the Coimbatore centre the overall disease incidence in this trial was low. The disease incidence was higher on H x B hybrids (27.48 to 39.08%). RCHB.708 Bt and RCHB.702 Bt as well as the non-Bt hybrids viz., DCH.32, TEHB.213 and DHB.105, were found to be susceptible to Bacterial blight disease. There was moderate to high level of incidence of Grey mildew and Alternaria leaf spot at Dharwad, Siruguppa, Lam (Guntur) and Coimbatore; moderate incidence of

Bacterial leaf blight at Dharwad and Siruguppa and Helminthosporium and Cercospora leaf spots at Lam.

- ◆ The protected plots yielded more than the unprotected plots, leading to the conclusion that these test hybrids were susceptible to sap sucking pests and it is important to check their build up on these hybrids. RCHB.708Bt yielded seed cotton of 1499 kg/ha under protected conditions, while it gave 1174 kg/ha seed cotton. In the case of RCHB.702 Bt, the seed cotton yield was 1928 kg/ha under protected conditions while, in unprotected plots, its yield was 1543 kg/ha.
- ◆ It was recorded that the length and strength along with micronaire were superior to check hybrids. The mean fibre quality data of these hybrids do not provide enough evidence that they conform to SITRA norms that is now accepted as the yard-stick of fibre quality for achieving defined yarn quality and yield. Confirmation of this through full scale mill test is desirable to recommend the promising hybrids for cultivation by farmers in this zone. The worthiness of the genotype has to be based on their ability to reduce damage due to the three bollworms along with desirable fibre properties.

INTERSPECIFIC (H x B) Bt HYBRID EVALUATION

Centres involved:

University of Agricultural Sciences, Cotton Research Station, Dharwad
Tamil Nadu Agricultural Research University, RARS-TNAU, Vaigai Dam
Central Institute for Cotton Research, Regional Station, Coimbatore

Test hybrid entries:

INTERSPECIFIC (H x B) Bt hybrids with Bt Cry 1A (c) gene (Bollgard I):
RCHB.708Bt and RCHB.702 Bt with check hybrids, DCH. 32, TCHB.213 &
DHB. 105.

BREEDING (protected) & PLANT PROTECTION (unprotected) evaluation: DESIGN-
RBD - No. of treatments :16, 3 REPLICATIONS – 6 ROWS X 6 metre rows

RESULTS OF EVALUATIONS

The Breeding and Plant Protection evaluations were undertaken and the data recorded in the designated five centers. The results are given below in this report.

BREEDING EVALUATION

The breeding evaluation concentrated on various observations on plant biometric characters such as number of monopodia per plant, number of sympodia per plant, nodes per plant, mean length of sympodia, number of fruiting points per sympodium, number of green bolls per plant at harvest, number of burst bolls per plant at harvest, mean boll weight, seed index, Lint index, mean seed cotton yield per plant and per plot and final yield (calculated) of seed cotton yield per hectare in addition to the fibre length, strength and micronaire of the entries tested.

The Germination data of the Breeding and Entomology evaluations are given below. The general plant stand of all entries was quite good, as seen from the following tables.

Percent germination in Breeding Evaluation

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	75.24	98.00	100.00	91.08
RCHB.702 Bt	77.77	98.00	95.00	90.26
DCH.32 (CC)	72.72	95.00	95.83	87.85
TCHB.213 (CC)	78.78	98.00	92.92	89.90
DHB.105 (CC)	77.77	95.00	94.59	89.12

MEAN LENGTH OF FIRST SYMPODIUM (cm):

The mean sympodial length was shorter in the test hybrids than the check hybrids.

Entry	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	63.50	54.88	59.19
RCHB.702 Bt	58.50	50.75	54.63
DCH.32 (CC)	71.00	53.45	62.23
TCHB.213 (CC)	63.50	60.63	62.07
DHB.105 (CC)	57.00	45.75	51.38
CD at 5%	9.47	3.08	
CV%	10.97	4.32	

TOTAL BOLLS/PLANT:

More number of bolls was recorded in Bt test hybrids than the check hybrids.

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	20.2	30.3	56	35.50
RCHB.702 Bt	20.33	31.4	61	37.58
DCH.32 (CC)	18.53	22.34	44	28.29
TCHB.213 (CC)	11.93	26.8	45	27.91
DHB.105 (CC)	15.33	28.5	47	30.28
CD at 5%		5.25	6.01	
CV(%)		13.97	9.12	

BOLL WEIGHT (g):

The boll weight of test Bt hybrids was more than the check hybrids.

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	3.88	4.26	4.29	4.1
RCHB.702 Bt	3.85	4.85	4.68	4.5
DCH.32 (CC)	3.80	4.19	3.79	3.9
TCHB.213 (CC)	3.58	4.53	3.91	4.0
DHB.105 (CC)	3.75	3.84	3.76	3.8
CD at 5%	0.33	0.5	0.46	
CV(%)	5.03	8.44	7.91	

PERCENT GINNING OUTTURN:

The percent ginning out turn was similar to check hybrids in Bt test hybrids.

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	32.44	33.10	34.37	33.30
RCHB.702 Bt	34.55	31.30	34.08	33.31
DCH.32 (CC)	33.22	37.40	36.20	35.61
TCHB.213 (CC)	25.77	30.40	33.26	29.81
DHB.105 (CC)	32.22	34.40	35.20	33.94
CD at 5%	0.72	2.41	1.54	
CV(%)	1.35	5.28	3.12	

MEAN LINT INDEX (g)

The mean lint index was higher in Bt test hybrids over check hybrids.

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	4.79	6.43	6.09	5.77
RCHB.702 Bt	4.45	6.40	6.17	5.67
DCH.32 (CC)	4.96	6.81	5.30	5.69
TCHB.213 (CC)	3.22	6.15	5.41	4.93
DHB.105 (CC)	5.38	6.03	5.25	5.55
CD at 5%	0.31	0.61	0.68	
CV(%)	3.9	7.26	8.32	

MEAN SEED INDEX (g)

There was no difference in mean seed index of all the hybrids in this evaluation.

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	10.00	12.99	11.62	11.54
RCHB.702 Bt	9.67	14.09	11.90	11.89
DCH.32 (CC)	10.00	11.41	9.34	10.25
TCHB.213 (CC)	9.33	14.11	10.86	11.43
DHB.105 (CC)	11.33	11.52	9.68	10.84
CD at 5%	0.57	0.73	1.04	
CV(%)	3.19	4.28	6.54	

SEED COTTON YIELD (Protected condition)

The seed cotton yield was low in general during this year. The Bt test hybrids were superior to check hybrids under protected conditions.

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	1041	1838	1617	1499
RCHB.702 Bt	1063	2371	2351	1928
DCH.32 (CC)	537	884	1536	986
TCHB.213 (CC)	346	1000	1639	995
DHB.105 (CC)	350	1060	1799	1070
CD at 5%	120	291.48	303.54	
CV(%)	9.65	13.98	11.69	

Fibre property

The fibre property of the test hybrids are given in the following tables. It was recorded that the length and strength along with micronaire were superior to check hybrids.

2.5% span length (mm)

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	34.90	35.30	36.80	35.67
RCHB.702 Bt	35.50	34.90	36.70	35.70
DCH.32 (CC)	33.80	34.00	36.40	34.73
TCHB.213 (CC)	32.80	35.10	36.70	34.87
DHB.105 (CC)	29.30	34.40	32.20	31.97

Bundle strength (g/tex)

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	27.40	22.00	26.50	25.30
RCHB.702 Bt	28.90	23.10	26.80	26.27
DCH.32 (CC)	25.10	22.00	23.30	23.47
TCHB.213 (CC)	26.40	22.70	23.90	24.33
DHB.105 (CC)	22.90	25.20	24.10	24.07

Micronaire (10⁻⁶ g/in)

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	3.10	3.80	3.80	3.57
RCHB.702 Bt	3.20	4.00	3.80	3.67
DCH.32 (CC)	2.70	3.50	3.50	3.23
TCHB.213 (CC)	2.90	3.40	3.70	3.33
DHB.105 (CC)	3.40	2.90	3.80	3.37

The mean fibre quality data of these hybrids do not provide enough evidence that they conform to SITRA norms that is now accepted as the yard-stick of fibre quality for achieving defined yarn quality and yield. Confirmation of this through full scale mill test is desirable to recommend the promising hybrids for cultivation by farmers in this zone. The worthiness of the genotype has to be based on their ability to reduce damage due to the three bollworms along with desirable fibre property.

Mean fibre property values

Entry	Span length (mm)	Fibre tenacity (g/tex)	micronaire
RCHB.708 Bt	35.67	25.30	3.57
RCHB.702 Bt	35.70	26.27	3.67
DCH.32 (CC)	34.73	23.47	3.23
TCHB.213 (CC)	34.87	24.33	3.33
DHB.105 (CC)	31.97	24.07	3.37

Plant Protection Evaluation – Protected Trial

Under protected conditions, the test Bt hybrids were as much susceptible to jassids in this zone in 2004 season as the check hybrids in spite of appropriate pesticide spraying.

Jassids (average of 3 leaves/plant)

Entry	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	6.80	12.50	9.65
RCHB.702 Bt	6.48	14.00	10.24
DCH.32 (CC)	6.72	13.75	10.24
TCHB.213 (CC)	2.30	12.50	7.40
DHB.105 (CC)	6.92	11.50	9.21
CD at 5%	0.4	0.44	
CV(%)	10.1	7.75	

Under protected conditions, the test Bt hybrids had high thrips population in this zone in 2004 season as the check hybrids in spite of appropriate pesticide spraying.

Thrips (average of three leaves per plant)

Entry	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	2.00	9.00	5.50
RCHB.702 Bt	0.75	5.75	3.25
DCH.32 (CC)	1.33	4.50	2.92
TCHB.213 (CC)	2.15	7.75	4.95
DHB.105 (CC)	1.05	6.75	3.90
CD at 5%	0.9	0.46	
CV(%)	7.9	11.66	

The Spotted bollworm (SBW) was noticed in Coimbatore and Vaigai only in this zone. It was noticed that the Bt test hybrids did reduce the SBW number in comparison to check hybrids, as seen below in the protected plots.

Spotted bollworms (No. of larvae/5 plants)

Entry	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	2.00	3.25	2.63
RCHB.702 Bt	0.00	2.25	1.13
DCH.32 (CC)	2.00	7.50	4.75
TCHB.213 (CC)	1.00	8.00	4.50
DHB.105 (CC)	1.00	4.75	2.88
CD at 5%	NS	0.41	
CV(%)	14.4	13.62	

The population of American bollworm was quite low during the 2004 season and there was not proper testing of these hybrids against this important pest.

American bollworms (No. of larvae/5 plants)

Entry	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	1.00	0.25	0.63
RCHB.702 Bt	2.00	0.25	1.13
DCH.32 (CC)	1.00	0.75	0.88
TCHB.213 (CC)	1.00	0.50	0.75
DHB.105 (CC)	1.00	0.75	0.88

The Pink bollworm was found to infest and the percent locule damage was quite high in Bt test hybrids. However, reduction in damage over check hybrids was seen.

Locule damage (%)

Entry	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	5.56	23.74	14.65
RCHB.702 Bt	6.85	27.28	17.07
DCH.32 (CC)	9.66	34.54	22.10
TCHB.213 (CC)	8.45	52.04	30.25
DHB.105 (CC)	6.25	39.63	22.94
CD at 5%	6.9	4.43	
CV(%)	16.7	8	

The percent open boll damage was also seen in the test Bt hybrids as much as that in check hybrids, as seen from the table below. The protected plots of test hybrids also had similar open boll damage as much as that in check hybrids.

Open boll damage (%)

ENTRY	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	3.33	11.74	7.54
RCHB.702 Bt	3.25	9.99	6.62
DCH.32 (CC)	5.25	7.58	6.42
TCHB.213 (CC)	4.65	10.10	7.38
DHB.105 (CC)	5.55	8.09	6.82
CD at 5%	2.9	0.59	
CV(%)	9.3	2.13	

Plant Protection Evaluation – Unprotected Trial

Although lower in population, the Bt entries had jassid damage in low level, although the check hybrids also had high levels of this insect.

Jassids (average on 3 leaves/plant)

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	1.51	7.80	14.25	7.85
RCHB.702 Bt	2.04	6.08	18.75	8.96
DCH.32 (CC)	3.19	6.72	22.50	10.80
TCHB.213 (CC)	2.30	3.84	14.25	6.80
DHB.105 (CC)	2.92	6.92	18.75	9.53
CD at 5%	0.37	12.29	0.24	
CV(%)	8.45	14.16	3.76	

The Bt entries had thrips in high population as much as check hybrids.

Thrips (average on 3 leaves/plant)

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	10.40	3.33	11.00	8.24
RCHB.702 Bt	11.36	1.10	12.00	8.15
DCH.32 (CC)	11.76	4.15	9.25	8.39
TCHB.213 (CC)	14.26	3.33	6.75	8.11
DHB.105 (CC)	9.33	4.50	5.75	6.53
CD at 5%	1.81	4.51	0.65	
CV(%)	9.04	10.86	15.17	

It was found that Spotted bollworm was observed in these hybrids. The Bt test hybrids had a mean value of 1.13 per 5 plants in comparison to more than a maximum of 3.68 in certain check hybrids.

Spotted bollworms (mean of counts/5 plants) – Unprotected Condition

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	0.13	1.00	3.00	1.38
RCHB.702 Bt	0.13	0.00	3.25	1.13
DCH.32 (CC)	0.03	2.00	9.00	3.68
TCHB.213 (CC)	0.23	1.00	9.50	3.58
DHB.105 (CC)	0.20	2.00	6.25	2.82
CD at 5%	0.18	NS	0.36	
CV(%)	8.25	14.4	10.5	

However, the American bollworm was very low in population and the test hybrids could not be subjected to proper testing against this pest.

American bollworms (mean of counts/5 plants) – Unprotected Condition

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	1.83	1.00	0.25	1.03
RCHB.702 Bt	1.50	0.00	0.25	0.58
DCH.32 (CC)	0.52	1.00	0.25	0.59
TCHB.213 (CC)	0.50	1.00	0.50	0.67
DHB.105 (CC)	0.83	1.00	0.75	0.86
CD at 5%	NS	NS	0.2	
CV(%)	9.14	8	13.72	

% Square Damage

Entry	Dharwad	Coimbatore	Mean
RCHB.708 Bt	3.63	0.80	2.22
RCHB.702 Bt	6.37	2.00	4.19
DCH.32 (CC)	8.11	3.95	6.03
TCHB.213 (CC)	14.55	1.85	8.20
DHB.105 (CC)	10.14	1.25	5.70
CD at 5%	1.83	2.9	
CV(%)	6.37	7.1	

The percent green boll damage was high in RCHB.702Bt.

Percent Green boll damage

Entry	Dharwad	Coimbatore	Mean
RCHB.708 Bt	1.72	8.33	5.03
RCHB.702 Bt	1.48	19.56	10.52
DCH.32 (CC)	6.10	22.25	14.18
TCHB.213 (CC)	2.03	10.33	6.18
DHB.105 (CC)	3.68	18.25	10.97
CD at 5%	1.97	1.5	
CV(%)	11.59	12.9	

The percent locule damage was very high under unprotected conditions in the test hybrids.

Percent Locule damage – Unprotected Condition

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	14.66	10.25	28.02	17.64
RCHB.702 Bt	14.13	20.65	22.69	19.16
DCH.32 (CC)	18.45	25.55	51.25	31.75
TCHB.213 (CC)	16.54	18.36	53.40	29.43
DHB.105 (CC)	13.11	12.58	37.70	21.13
CD at 5%	3.19	2.8	3.55	
CV(%)	7	9.4	6.28	

The open boll damage, indicative of Pink bollworm damage was over 10% in the test hybrids.

Percent Open boll damage – Unprotected Condition

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	23.13	8.44	13.58	15.05
RCHB.702 Bt	26.27	8.23	12.58	15.69
DCH.32 (CC)	23.40	21.25	12.08	18.91
TCHB.213 (CC)	23.94	12.15	11.90	16.00
DHB.105 (CC)	29.01	17.40	11.80	19.40
CD at 5%	3.01	6.6	0.76	
CV(%)	5.94	15.2	9.39	

The seed cotton yield under unprotected condition was 1543 kg/ha for RCHB.702Bt and 1174 kg/ha in the case of RCHB.708Bt.

Seed cotton yield (Kg/ha) – Unprotected Condition

Entry	Dharwad	Coimbatore	Vaigai Dam	Mean
RCHB.708 Bt	1286	1181	1056	1174
RCHB.702 Bt	1253	1850	1525	1543
DCH.32 (CC)	448	826	1006	760
TCHB.213 (CC)	495	958	1133	862
DHB.105 (CC)	812	852	910	858
CD	172.05	228.28	409.44	
CV(%)	8.93	1393	15.7	

The pesticide spraying against sap sucking pests ranged between 1 and 3 in these test hybrids during 2004 season.

Number of sprays for sap sucking pests – Protected

Entry	Coimbatore		Vaigai Dam
	Protected	Unprotected	
RCHB.708 Bt	1	-	3
RCHB.702 Bt	1	1	3
DCH.32 (CC)	-	1	3
TCHB.213 (CC)	-	1	3
DHB.105 (CC)	1	1	3

Plant Pathology Evaluation

During 2004 – 05, there was moderate to high level of incidences of Grey mildew and Alternaria leaf spot at Dharwad, Siruguppa, Lam (Guntur) and Coimbatore; moderate incidence of Bacterial leaf blight at Dharwad and Siruguppa and Helminthosporium and Cercospora leaf spots at Lam. We were able to assess properly the reaction of various Bt and non-Bt hybrids to the above mentioned diseases in the Southern Centres.

Alternaria blight:

The H x B hybrids was tested only at Dharwad and at Vaigai dam under Coimbatore centre. Both H x B Bt and non-Bt hybrids were found susceptible to this disease and there were no significant differences among them in their reactions at Dharwad. Since the incidence at Coimbatore was low, RCHB 708 Bt and RCHB 702 Bt showed moderate susceptibility, as given below.

Reaction of H x B Bt entries to Alternaria leaf spot
(Per cent Disease Incidence)

Name of entry	Dharwad		Coimbatore			
	Protected	Unprotected	Protected		Unprotected	
			Grade	PDI	Grade	PDI
RCHB.708Bt	33.03 (35.06)	30.63 (33.58)	1	15.00	2	25.00
RCHB.702Bt	33.61 (345.43)	27.13 (31.37)	0	0.00	2	22.50
DCH.32	31.51 (34.14)	28.58 (32.33)	2	25.00	1	17.50
TCHB.213	31.06 (33.90)	27.91 (31.88)	0	0.00	2	22.50
DHB.105	33.07 (35.12)	26.92 (31.24)	1	8.75	1	8.75

Bacterial leaf blight:

The disease incidence was higher on H x B hybrids (27.48 to 39.08%). All four H x B Bt hybrids viz., RCHB 708 Bt, RCHB 702 Bt, MRC 6918 Bt and MRC 6928 Bt as well as the non-Bt hybrids viz., DCH 32, TEHB 213, DHB 105, MRC 6918 and MRC 6928 were found susceptible to bacterial blight and the differences were not significant in both protected and unprotected plots.

Reaction of H x B Bt entries to Bacterial blight
(Per cent Disease Incidence)

Name of entry	Dharwad	
	Protected	Unprotected
RCHB.708Bt	35.29 (36.45)	30.49 (33.52)
RCHB.702Bt	36.34 (37.11)	29.95 (33.21)
DCH.32	37.48 (37.76)	28.39 (32.20)
TCHB.213	34.65 (36.03)	30.19 (33.34)
DHB.105	37.05 (37.52)	27.48 (31.63)
CD at 5%	NS	NS
CV %	4.58	5.6

Grey mildew:

Very high incidence of Grey mildew was noticed in Dharwad and Siruguppa and moderate incidence in Lam and Coimbatore (TNAU). The H x B hybrids viz., RCHB 708 Bt, RCHB 702 Bt and H x B checks were found to be equally susceptible to Grey mildew in Dharwad with the disease incidence ranging 30.35 percent on RCHB 702 Bt; 30.53 to 34.60 percent on RCHB 708 Bt; in the Coimbatore centre the overall disease incidence in this trial was low.

Reaction of H x B Bt III entries to Grey mildew
(Per cent Disease Incidence)

Name of entry	Dharwad		Coimbatore			
	Protected	Unprotected	Protected		Unprotected	
			Grade	PDI	Grade	PDI
RCHB.708Bt	34.60 (36.03)	30.53 (33.52)	0	0.00	0	0.00
RCHB.702Bt	35.50 (36.57)	30.35 (33.46)	1	2.50	0	0.00
DCH.32	38.87 (38.59)	31.25 (34.02)	2	11.75	0	0.00
TCHB.213	38.01 (38.06)	33.67 (35.49)	1	8.75	1	11.25
DHB.105	36.78 (37.35)	30.73 (33.65)	1	3.75	1	6.25
CD at 5%	NS	NS				
CV %	4.82	7.7				

Conclusions:

- Under protected conditions, the test Bt hybrids were as much susceptible to jassids and thrips in this zone in 2004 season as the check hybrids in spite of appropriate pesticide spraying.
- The gene action to reduce bollworm suppression could not be tested against American bollworm, as they were in low population. In the case of Pink bollworm infestation, the protected plots of test hybrids also had similar open boll damage as much as that in check hybrids. The percent locule damage was very high under unprotected conditions in the test hybrids. The open boll damage, indicative of Pink bollworm damage, was over 10% in the test hybrids when pesticide application against bollworms was not done. The Spotted bollworm infestation in test hybrids was low. The number of pesticide spraying against sap sucking pests ranged between 1 and 3 in these test hybrids during 2004 season.
- Very high incidence of Grey mildew was noticed in Dharwad and Siruguppa and moderate incidence in Lam and Coimbatore (TNAU) in the test hybrids. They were found to be susceptible to Bacterial blight disease.
- The protected plots yielded more than the unprotected plots, leading to the conclusion that these test hybrids were susceptible to sap sucking pests and it is important to check their build up on these hybrids.
- The fibre length and strength along with micronaire were superior to check hybrids. Confirmation of their fibre quality based on full scale mill test is desirable to recommend the promising hybrids for cultivation by farmers in this zone.

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