

## CONTENTS

PARTICULARS	PAGE
Executive Summary	3
Bt cotton hybrids evaluation report	6
<b>FIRST YEAR EVALUATION</b>	
<b>Intra <i>hirsutum</i> hybrids</b>	10
A. Biometrical evaluation	10
B. Mean seed cotton yield under Plant Protection	14
C. Fibre quality evaluation	15
D. Entomological evaluation	17
1. Evaluation under protected conditions	17
2. Evaluation under unprotected conditions	26
E. Mean seed cotton yield under unprotected conditions	27
F. Pathological evaluation	28
G. Overall assessment	29
<b>SECOND YEAR EVALUATION</b>	
<b>Intra <i>hirsutum</i> hybrids</b>	31
A. Biometrical evaluation	31
B. Mean seed cotton yield under Plant Protection	38
C. Fibre quality evaluation	40
D. Entomological evaluation	45
1. Evaluation under protected conditions	45
2. Evaluation under unprotected conditions	60
E. Mean seed cotton yield under unprotected conditions	62
F. Pathological evaluation	64
G. Overall assessment	66

<b>Inter specific hybrids</b>	67
A. Biometrical evaluation	67
B. Mean seed cotton yield under Plant Protection	69
C. Fibre quality evaluation	69
D. Entomological evaluation	71
1. Evaluation under protected conditions	71
2. Evaluation under unprotected conditions	73
E. Mean seed cotton yield under unprotected conditions	74
F. Pathological evaluation	74
G. Overall assessment	75
<b>COMBINED REPORT OF TWO YEARS (2004-05 &amp; 05-06)</b>	
<b>Combined report of Intra hirsutum hybrids</b>	76
A. Biometrical evaluation	76
B. Mean seed cotton yield under Plant Protection	77
C. Fibre quality evaluation	79
D. Entomological evaluation	82
1. Evaluation under protected conditions	82
2. Evaluation under unprotected conditions	85
E. Mean seed cotton yield under unprotected conditions	86
F. Pathological evaluation	88
G. Overall assessment	90
<b>Combined report of inter specific hybrids</b>	92

## EXECUTIVE SUMMARY

The All India Coordinated Cotton Improvement Project was assigned the task of evaluating the Bt cotton hybrids in South Zone. The Intra *hirsutum* hybrids were evaluated at five locations. At Coimbatore (TNAU) and Siruguppa (UAS, Dharwad), it was conducted under irrigated conditions and at Guntur (ANGRAU), Nandyal (ANGRAU) and Dharwad (UAS, Dharwad) it was conducted under rainfed conditions. The inter specific hybrid was evaluated at Coimbatore (TNAU), Vaigaidam (TNAU) and Dharwad (UAS, Dharwad).

### **Intra *hirsutum* hybrid Evaluation - I year**

Nine Bt cotton hybrids were evaluated with three checks. All the entries tested were found to be susceptible to the sucking pests at varying levels and warranted chemical intervention.

The over all larval population was low. The square damage at 90 DAS was considerable on all entries at Nandyal and warranted chemical intervention. At other places it was low. Eventhough the open boll and locule damage was the highest on non-Bt check Bunny, considerable damage was noticed on Bt hybrids also at Nandyal and Dharwad.

In seed cotton yield, the test entries ACH 155-1 Bt and VICH 9 Bt were superior to all the three check hybrids. When compared with only two check hybrids (Bunny and RCH 368 Bt) the test hybrid KDCHH 9810 Bt and RCH 533 BG II were also found to be superior in seed cotton yield.

The overall fibre quality was good, eventhough the required length to strength ratio was lacking.

### **Intra *hirsutum* hybrid evaluation - II Year**

Twenty six Bt hybrids were evaluated with three checks. Jassid was the main sucking pest encountered throughout the growing season. Sucking pest damage warranted chemical intervention in all the entries.

Eventhough the larval population was low, considerable square damage and open boll and locule damage were noticed at certain centres. The extent of boll worm damage was less on Bt cotton hybrids as compared to non-Bt check hybrid Bunny.

Entries MRC 6100 Bt, Brahma Bt, Dhanwan Bt, RCH 371 Bt, Tulasi 117 Bt, Tulasi 4 Bt, MRC 7351 BG II and NCS 913 Bt were superior in seed cotton yield under

both irrigated and rainfed condition.

Entries GK 207 Bt, GK 209 Bt, ACH 33-1 Bt and PRCH 103 Bt were higher yielding under irrigated conditions. Entries NCEH 3R Bt, MRC 7228 BG II and RCH 11 Bt were superior under rainfed situation only.

### **Inter specific hybrid evaluation - II year**

Hybrid RCHB 708 Bt was evaluated along with three non-Bt check hybrids. The test hybrid as well as all the three check hybrids were susceptible to the sucking pests. However, bollworm damage was lesser than that recorded on the non-Bt checks.

Hybrid RCHB 708 Bt recorded significantly higher yield over the check hybrids. In fibre quality also, it was superior to the checks with less micronaire and higher fibre strength.

### **Combined report of two years**

#### **Intra *hirsutum* hybrid**

Twenty six Bt cotton hybrids were evaluated with three checks. All the hybrids evaluated, including the check hybrids were susceptible to sucking pests at varying levels. Chemical intervention was required to suppress the sucking pest population.

The larval population of bollworms was low at all the centres. Open boll and locule damage at harvest were the highest in the non-Bt check hybrid Bunny. The Bt check hybrid RCH 2 Bt recorded a mean open boll damage of 12.1 per cent and locule damage of 9.5 per cent. Most of the hybrids evaluated were comparable to the Bt check hybrids in open boll and locule damage.

Under high disease pressure, all the test entries and the check hybrids were found to be susceptible to major cotton diseases and need prophylactic disease control measures.

In seed cotton yield, seven Bt hybrids were superior to the check hybrids under both irrigated and rainfed conditions. They are: RCH 371 Bt, MRC 6100 Bt, MRC 7228 BG II, MRC 7351 BG II, NCS 913 Bt, NCEH 3R Bt and Brahma Bt. Eight hybrids *viz.*, NCEH 2R Bt, Tulasi 4 Bt, Tulasi 117 Bt, Dhanwan Bt, GK 207 Bt, GK 209 Bt, ACH 33-1 Bt and ACH 21-1 Bt were superior under irrigated conditions. The Hybrids RCH 111 Bt and JKCH 99 Bt were superior under rainfed conditions.

Quality wise, all the hybrids were on par with the check hybrids.

**Inter specific hybrid**

One inter specific (*G. hirsutum* x *G. barbadense*) hybrid RCHB 708 Bt was evaluated with three non-Bt check hybrids.

The test hybrid RCHB 708 Bt and all the checks were susceptible to Jassids and required chemical intervention to control them. The larval population of bollworms and open boll and locule damage at harvest were less on RCHB 708 Bt, compared to the other check hybrids. Mean yield of RCHB 708 Bt was significantly superior to the other check hybrids under both protected and unprotected conditions. Quality wise also, RCHB 708 Bt was superior to the other check hybrids.

## BT COTTON HYBRIDS EVALUATION REPORT

### SOUTH ZONE

The All India Coordinated Cotton Improvement Project (AICCIP) was assigned the task of evaluating the Bt Cotton Hybrids in the South Zone vide ICAR letter No. 2(4)/2005-CCI dt.13.05.05 and 27.05.05. There were three sets of trials:

1. Intra *hirsutum* Bt cotton Hybrid Trial – First year
2. Intra *hirsutum* Bt cotton Hybrid Trial - Second year
3. Interspecific (*G. hirsutum* x *G. barbadense*) Hybrid Trial - Second year

#### **Test Entries**

1. In the Intra *hirsutum* First year Trial, there were Ten Entries. They are:

- i) MRC 7160 BG II and MRC 7347 BG II from MAHYCO Seeds
- ii) ACH 155-1 Bt from Ajeet Seeds
- iii) KDCHH 9810 Bt and KDCHH 621 BG II from Krishidhan Seeds
- iv) Paras Laxmi Bt from Emergent Genetics
- v) RCH 530 BG II and RCH 533 BG II from RASI seeds and
- vi) VICH 5 Bt and VICH 9 Bt from Vikram Seeds

2. In the Intra *hirsutum* second year trial, there were 26 entries. They are:

- i) RCH 111 Bt and RCH 371 Bt from RASI Seeds
- ii) MRC 6100 Bt, MRC 7228 BG II and MRC 7351 BG II from MAHYCO Seeds
- iii) NCS 913 Bt from Nuziveedu Seeds
- iv) JKCH 99 Bt, JKCH 10 Bt and JKCH 634 Bt from JK Seeds
- v) NCEH 2R Bt and NCEH 3R Bt from Nath Seeds
- vi) Tulasi 4 Bt and Tulasi 117 Bt from Tulasi Seeds
- vii) NPH 2270 Bt and NPH 2171 Bt from Prabhat Seeds
- viii) Brahma Bt and Dhanwan Bt from Emergent Genetics
- ix) GK 207 Bt and GK 209 Bt from Ganga Kaveri Seeds
- x) ACH 33-1 Bt, ACH 11-1 Bt and ACH 21-1 Bt from Ajeet Seeds
- xi) KDCHH 9632 Bt and KDCHH 441 BG II from Krishidhan Seeds and
- xii) PRCH 102 Bt and PRCH 103 Bt from Pravardhan Seeds

3. In the Interspecific (*G. hirsutum* x *G. barbadense*) hybrid trial, only one entry viz., RCHB 708 Bt was evaluated.

### The Trial Locations

The following were the trial locations for evaluating the intra *hirsutum* hybrids

#### (i). Irrigated trials

1. Agricultural Research Station, **Siruguppa** under University of Agricultural Sciences, Dharwad, Karnataka
2. Tamil Nadu Agricultural University, **Coimbatore**, Tamil Nadu.

#### (ii). Rainfed Trials

1. University of Agricultural Sciences, **Dharwad**, Karnataka
2. Agricultural Research Station, LAM, **Guntur** under ANGRAU, Hyderabad, Andhra Pradesh
3. Agricultural Research Station, **Nandyal** under ANGRAU, Hyderabad, Andhra Pradesh.

The Interspecific (*G. hirsutum* x *G. barbadense*) hybrid trial was conducted at

- 1) Tamil Nadu Agricultural University, **Coimbatore**, Tamil Nadu
- 2) Agricultural Research Station, **Vaigaidam** under TNAU, Coimbatore, Tamil Nadu
- 3) University of Agricultural Sciences, **Dharwad**, Karnataka

### The Trial Details

The following are the trial details.

#### 1. Intra *hirsutum* hybrid trial – I year

Number of Entries	: 10 + 3 Check
Number of Rows	: 6
Row length	: 6 m
Number of Replications	: Three
Design	: Randomized Block design
Spacing	: 90 x 45 cm at Coimbatore 90 x 60 cm at Siruguppa, Nandyal and Dharwad 120 x 60 cm at Guntur
Fertilizer dose	: 120:60:60 N, P, K kg/ha at Coimbatore 150:75:75 N, P, K kg/ha at Guntur and Siruguppa 60:30:30 N, P, K kg/ha at Nandyal 80:40:40 N, P, K kg/ha at Dharwad

Date of Sowing : 5.8.05 at Coimbatore  
 16.07.05 at Siruguppa  
 28.07.05 at Guntur  
 25.07.05 at Nandyal  
 26.06.05 at Dharwad

### **2. Intra *hirsutum* hybrid trial – II Year**

Number of Entries : 26 + 3 Checks  
 Number of Rows : Three  
 Row length : 6 M  
 Number of replication : Three  
 Design : Randomized Block design  
 Spacing : 90 x 45 at Coimbatore  
 90 x 60 at Siruguppa, Nandyal and Dharwad  
 120 x 60 at Guntur  
 Fertilizer dose : 120:60:60 N, P, K kg/ha at Coimbatore  
 150:75:75 N, P, K kg/ha at Guntur and Siruguppa  
 60:30:30 N, P, K kg/ha at Nandyal  
 80:40:40 N, P, K kg/ha at Dharwad  
 Date of Sowing : 5.8.05 at Coimbatore  
 16.07.05 at Siruguppa  
 28.07.05 at Guntur  
 25.07.05 at Nandyal  
 26.06.05 at Dharwad

### **3. Interspecific (*G .hirsutum* x *G. barbadense*) hybrid trial – II Year**

Number of Entries : 1 + 3 Check  
 Number of rows : Four  
 Row length : 6 M  
 Number of Replications : Five  
 Design : Randomized Block design  
 Spacing : 120 x 60 at Vaigaidam  
 90 x 60 at Coimbatore and Dharwad  
 Fertilizer dose : 120:60:60 N, P, K kg/ha at Vaigaidam and  
 Coimbatore  
 80:40:40 N, P, K kg/ha at Dharwad



Date of sowing : 5.08.05 at Coimbatore  
20.09.05 at Vaigaidam  
26.06.05 at Dharwad

## **Method of evaluation**

### **1. Evaluation under protected conditions**

Weekly observations were recorded from 45 DAS against major sucking pests and bollworms. The insecticidal sprayings were given based on the economic threshold levels of the sap sucking pests and bollworms. The sprayings were undertaken in all the replications of an entry, even if the threshold level of infestation had exceeded only in one of the replications.

### **2. Evaluation under unprotected conditions**

Under unprotected conditions, only sap sucking pests were controlled and no protection was given against bollworms.

## **Observations recorded**

The biometrical observations like germination percentage, final plant stand, number of days for first and fifty per cent flowering, bolls per plant, mean boll weight, ginning percentage, lint and seed index and seed cotton yield were recorded in the ETL based plant protection trial. Important fibre quality attributes like 2.5% span length, uniformity ratio (%), micronaire and fibre strength were also determined through the High Volume Instrument. The entomological observations on sap sucking pests, bollworms, square damage, green boll damage, open boll damage and locule damage were recorded in ETL based plant protection trial. Under unprotected conditions, boll and locule damage and seed cotton yield were assessed. The pathological evaluations were taken up for the incidences of diseases like alternaria leaf spot, bacterial blight and grey mildew.

The trials have been reported in three parts. In the first part, the first year trials have been reported. In the second part, the second year confirmatory trial results have been reported. In the third part, the combined data of two years (2004-05 and 2005-06) of the second year trial entries have been reported.

## FIRST YEAR INTRA HIRSUTUM HYBRID EVALUATION

In this trial, ten intra *hirsutum* hybrids viz., MRC 7160 BG II and MRC 7347 BGII (MAHYCO Seeds), ACH 155-1 Bt (Ajeet Seeds), KDCHH 9810 BG II and KDCHH 621 Bt (Krishidhan Seeds), Paras Laxmi Bt (Emergent Genetics), RCH 530 BG II and RCH 533BG II (RASI Seeds) and VICH 5 Bt and VICH 9 Bt (Vikram Seeds) were evaluated. RCH 368 Bt and RCH 2 Bt were the Bt check hybrids. Bunny was the non-Bt check hybrid. Upon germination, it was observed that Paras Laxmi Bt was an interspecific (*G. hirsutum* x *G. barbadense*) hybrid and hence was deleted from all observations. The performance of remaining nine hybrids alone has been reported here.

### A. BIOMETRICAL EVALUATION

Biometrical observations recorded in the ETL based plant protection trials are reported below.

#### Germination and Final Stand

Germination and final plant stand have been reported from three centres. The germination percentage was over 90 per cent in all the entries tested (Table 1). Consequently, the final plant stand was also satisfactory (Table 2).

**Table 1. Germination percentage**

Entry	CBE	Siruguppa	Nandyal	Mean
MRC 7160 BG II	90.5	97.8	98.9	95.7
MRC 7347 BG II	87.7	95.6	97.9	93.7
ACH 155-1 Bt	90.9	100.0	100.0	97.0
KDCHH 9810 Bt	94.0	97.2	98.9	96.7
KDCHH 621 BG II	91.3	97.8	99.4	96.1
RCH 530 BG II	90.1	97.8	97.4	95.1
RCH 533 BG II	91.7	97.2	96.9	95.3
VICH 5 Bt	92.5	98.9	98.9	96.7
VICH 9 Bt	93.3	96.7	97.4	95.8
Bunny (Check)	90.9	96.7	97.9	95.1
RCH 368 Bt (Check)	90.1	96.1	97.9	94.7
RCH 2 Bt (Check)	90.9	98.3	100.0	96.4

**Table 2. Final Plant Stand (Number)**

Entry	CBE	Siruguppa	Nandyal	Mean
MRC 7160 BG II	67.0	58.7	64.0	63.2
MRC 7347 BG II	83.3	57.3	65.7	68.8
ACH 155-1 Bt	74.7	60.0	64.7	66.5

KDCHH 9810 Bt	81.0	58.3	65.0	68.1
KDCHH 621 BG II	75.0	58.7	62.0	65.2
RCH 530 BG II	77.3	58.7	65.0	67.0
RCH 533 BG II	82.3	58.3	65.7	68.8
VICH 5 Bt	80.3	59.3	65.7	68.5
VICH 9 Bt	89.3	58.0	64.7	70.7
Bunny (Check)	82.7	58.0	65.3	68.7
RCH 368 Bt (Check)	80.3	57.0	65.7	67.7
RCH 2 Bt (Check)	78.3	59.0	65.3	67.5

### First and Fifty Percent flowering

Flowering was comparatively early in Guntur as compared to Coimbatore and Nandyal (Table 3 and 4).

**Table 3. First flowering (Days)**

Entry	CBE	Guntur	Nandyal	Mean
MRC 7160 BG II	56.0	44.0	50.0	50.0
MRC 7347 BG II	55.0	48.0	51.0	51.3
ACH 155-1 Bt	56.0	44.0	50.0	50.0
KDCHH 9810 Bt	52.0	44.0	51.0	49.0
KDCHH 621 BG II	56.0	49.0	51.0	52.0
RCH 530 BG II	63.0	44.0	52.0	53.0
RCH 533 BG II	60.0	47.0	51.0	52.7
VICH 5 Bt	59.0	44.0	52.0	51.7
VICH 9 Bt	61.3	49.0	52.7	54.3
Bunny (Check)	59.0	45.0	51.0	51.7
RCH 368 Bt (Check)	59.0	48.0	52.0	53.0
RCH 2 Bt (Check)	61.0	49.0	50.0	53.3

**Table 4. 50% flowering (Days)**

Entry	CBE	Guntur	Nandyal	Mean
MRC 7160 BG II	60.0	49.0	58.0	55.7
MRC 7347 BG II	59.0	53.0	60.3	57.4
ACH 155-1 Bt	59.0	49.0	58.0	55.3
KDCHH 9810 Bt	56.0	49.0	58.3	54.4
KDCHH 621 BG II	59.0	54.0	59.3	57.4
RCH 530 BG II	66.0	49.0	61.0	58.7
RCH 533 BG II	64.0	53.0	61.0	59.3
VICH 5 Bt	63.0	49.0	59.0	57.0
VICH 9 Bt	65.0	54.0	60.0	59.7
Bunny (Check)	63.0	49.0	59.3	57.1
RCH 368 Bt (Check)	62.0	56.0	58.7	58.9
RCH 2 Bt (Check)	65.0	54.0	60.7	59.9

### Bolls per Plant

The differences in boll number were significant at all locations. Number of bolls per plant was, in general, more at Siruguppa, Guntur and Nandyal and less at Coimbatore and Dharwad (Table 5).

**Table 5. Bolls per plant (Number)**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad	Mean
MRC 7160 BG II	17.1	34.3	47.8	45.5	17.3	32.4
MRC 7347 BG II	26.5	37.5	49.7	50.7	16.7	36.2
ACH 155-1 Bt	28.6	46.5	50.9	52.1	18.7	39.3
KDCHH 9810 Bt	27.6	47.6	41.6	51.1	21.7	37.9
KDCHH 621 BG II	21.9	35.5	41.4	33.5	15.0	29.4
RCH 530 BG II	22.7	39.8	49.1	49.9	13.0	34.9
RCH 533 BG II	21.4	34.2	54.2	53.5	15.7	35.8
VICH 5 Bt	19.0	41.3	44.5	39.3	11.3	31.1
VICH 9 Bt	23.6	45.7	54.7	53.5	15.3	38.5
Bunny (Check)	22.7	31.4	49.1	24.2	16.0	28.7
RCH 368 Bt (Check)	22.1	44.6	57.1	42.9	19.7	37.3
RCH 2 Bt (Check)	22.1	43.7	42.9	59.6	25.7	38.8
CD at 5%	5.2	5.6	8.6	3.4	17.5	-
CV %	13.6	26.5	10.3	4.4	5.2	-

### Boll Weight

Boll weight varied significantly across locations. Boll weight at Nandyal was low. MRC 7160 BG II and VICH 5 Bt recorded a mean boll weight of 5.8 and 5.4 g, respectively (Table 6).

**Table 6. Boll Weight (g)**

Entry	Siruguppa	Guntur	Nandyal	Dharwad	Mean
MRC 7160 BG II	6.3	6.6	3.3	7.2	5.8
MRC 7347 BG II	6.2	5.1	3.5	5.5	5.1
ACH 155-1 Bt	5.1	5.1	3.3	5.4	4.7
KDCHH 9810 Bt	5.7	4.4	3.5	5.2	4.7
KDCHH 621 BG II	5.4	4.8	3.4	5.5	4.8
RCH 530 BG II	5.4	4.5	3.2	4.9	4.5
RCH 533 BG II	5.6	4.8	3.4	5.8	4.9
VICH 5 Bt	6.5	5.7	3.4	5.9	5.4
VICH 9 Bt	5.5	4.9	3.3	5.7	4.8
Bunny (Check)	5.4	4.7	3.4	5.5	4.7
RCH 368 Bt (Check)	5.4	5.1	3.2	5.6	4.8
RCH 2 Bt (Check)	5.5	4.8	3.2	5.4	4.7
CD at 5%	0.2	0.5	0.3	0.9	-
CV %	2.3	6.4	4.7	9.8	-

### Ginning out turn

Most of the Bt entries evaluated were better than the non-Bt check Bunny in ginning out turn. ACH 155-1 Bt had the highest ginning out turn of 36.8 per cent (Table 7).

**Table 7. Ginning out turn (%)**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad	Mean
MRC 7160 BG II	40.1	35.7	34.5	34.0	36.4	36.1
MRC 7347 BG II	38.1	31.5	35.3	32.0	34.3	34.2
ACH 155-1 Bt	41.1	36.9	33.7	35.3	37.2	36.8
KDCHH 9810 Bt	38.6	34.3	34.7	32.0	35.2	34.9
KDCHH 621 BG II	40.1	35.8	34.2	34.0	35.8	36.0
RCH 530 BG II	38.8	34.1	35.0	34.3	35.6	35.5
RCH 533 BG II	38.5	34.2	35.7	32.0	35.3	35.1
VICH 5 Bt	37.2	33.1	32.2	30.0	33.3	33.2
VICH 9 Bt	40.8	35.5	32.3	32.0	35.9	35.3
Bunny (Check)	37.6	32.4	32.3	32.0	34.1	33.7
RCH 368 Bt (Check)	38.6	34.3	36.5	34.0	36.0	35.9
RCH 2 Bt (Check)	37.0	33.6	34.9	34.0	35.1	34.9
CD at 5%	1.9	1.7	2.1	0.9	1.3	-
CV %	2.9	3.1	3.6	1.6	0.8	-

### Lint Index

The lint index varied from 5.8 g to 6.3 g (Table 8).

**Table 8. Lint Index (g)**

Entry	CBE	Siruguppa	Guntur	Dharwad	Mean
MRC 7160 BG II	7.8	6.6	5.2	5.1	6.2
MRC 7347 BG II	7.0	5.8	6.0	5.4	6.1
ACH 155-1 Bt	7.1	5.8	5.2	5.5	5.9
KDCHH 9810 Bt	6.6	5.9	4.9	5.8	5.8
KDCHH 621 BG II	7.3	6.6	5.8	5.4	6.3
RCH 530 BG II	7.2	6.3	5.2	4.8	5.9
RCH 533 BG II	7.6	6.4	5.7	5.6	6.3
VICH 5 Bt	7.4	6.4	5.1	4.8	5.9
VICH 9 Bt	6.9	5.8	4.8	6.0	5.9
Bunny (Check)	6.9	5.6	5.4	5.4	5.8
RCH 368 Bt (Check)	7.7	6.4	5.9	5.4	6.3
RCH 2 Bt (Check)	6.9	6.0	5.2	5.6	5.9
CD at 5%	0.7	0.4	0.7	6.3	-
CV %	5.7	4.3	7.9	0.6	-

## Seed Index

The Seed index was above ten grams in all the entries tested. VICH 5 Bt recorded the highest seed index of 12.8g (Table 9).

**Table 9. Seed index (g)**

Entry	CBE	Siruguppa	Guntur	Dharwad	Mean
MRC 7160 BG II	11.7	12.0	11.7	12.3	11.9
MRC 7347 BG II	11.5	12.6	11.5	12.0	11.9
ACH 155-1 Bt	9.9	9.8	9.8	11.0	10.1
KDCHH 9810 Bt	10.7	11.4	8.6	11.0	10.4
KDCHH 621 BG II	11.0	11.9	10.6	11.3	11.2
RCH 530 BG II	11.3	12.2	10.1	12.3	11.5
RCH 533 BG II	12.1	12.4	10.7	11.3	11.6
VICH 5 Bt	12.5	13.0	12.0	13.7	12.8
VICH 9 Bt	10.0	10.6	9.3	10.3	10.0
Bunny (Check)	11.4	11.7	10.8	11.7	11.4
RCH 368 Bt (Check)	12.3	12.2	11.7	11.7	12.0
RCH 2 Bt (Check)	11.8	11.8	9.9	11.3	11.2
CD at 5%	1.1	0.6	1.7	6.0	-
CV %	5.5	2.9	9.6	1.2	-

## B) MEAN SEED COTTON YIELD UNDER PROTECTED CONDITIONS

### i) Irrigated trials

All the hybrids, except KDCHH 621 BG II, recorded higher seed cotton yield than the non-Bt check hybrid Bunny. The percentage increase varied from 1 to 51 per cent (Table 10).

Among the Bt checks used, RCH 368 Bt recorded higher yield. Only two hybrids, ACH 155-1 Bt and VICH 9 Bt, were superior to RCH 368 Bt. The test entry KDCHH 9810 Bt and RCH 533 BG II were superior to RCH 2 Bt (Bt Check) but inferior to RCH 368 Bt (Superior Bt check).

### ii) Rainfed Trials

The test entry KDCHH 621 BG II was the only test entry inferior to Bunny (non Bt check) in seed cotton yield, while all the other test hybrids were superior to Bunny by 24 to 66 per cent (Table 10).

The Bt check hybrid RCH 2 Bt recorded the highest seed cotton yield of 2115 kg/ha in the trial. The test hybrid RCH 533 BG II with a mean seed cotton yield of 1957 kg/ha, though inferior to the best check RCH 2 Bt, was superior to the other Bt check hybrid RCH 368 (1851 kg/ha).

**Table 10. Seed cotton yield (Kg/ha) under protected condition**

Entry	Irrigated			Rainfed			
	CBE	Siruguppa	Mean	Guntur	Nandyal	Dharwad	Mean
MRC 7160 BG II	1637	2495	2066	2423	1556	1426	1802
MRC 7347 BG II	1935	2542	2239	1965	1635	1122	1574
ACH 155-1 Bt	2478	3345	2912	2069	1805	1439	1771
KDCHH 9810 Bt	1873	2989	2431	1772	1777	1332	1627
KDCHH 621 BG II	1763	2018	1890	1650	928	518	1032
RCH 530 BG II	1820	2665	2242	2225	1604	985	1605
RCH 533 BG II	1902	2910	2406	2551	1932	1387	1957
VICH 5 Bt	1681	2784	2232	2213	1380	1264	1619
VICH 9 Bt	2099	3165	2632	1969	1862	1517	1783
Bunny (Check)	1910	1958	1934	2044	539	1230	1271
RCH 368 Bt (Check)	2044	3182	2613	2660	1414	1479	1851
RCH 2 Bt (Check)	1941	2785	2363	2514	2298	1534	2115
CD at 5%	430	406		515	282	311	-
CV %	13.4	8.94		14.1	10.83	14	-

### C. FIBRE QUALITY EVALUATION

The Fibre Quality evaluations were done location-wise. Across locations, the fibre quality parameters showed variability. RCH 368 Bt (check) had the highest fibre length of 32.1 mm and was on par with Bunny (check). Among the test hybrids, RCH 530 BG II was the best with a fibre length of 31.9 mm (Table 11).

Other characters like Micronaire, Uniformity ratio (%) and Elongation (%) showed considerable variation. Fibre strength of test entries varied from 21.4 g/tex to 23.1 g/tex (Table 12, 13, 14 and 15).

However, they fell much below the required length to strength ratio (Table 16).

**Table 11. 2.5% Span length (mm)**

Entry	CBE	Guntur	Dharwad	Mean
MRC 7160 BG II	29.5	26.5	28.3	28.1
MRC 7347 BG II	32.7	31.2	30.9	31.6
ACH 155-1 Bt	28.8	26.9	26.9	27.5
KDCHH 9810 Bt	29.1	26.2	31.0	28.8
KDCHH 621 BG II	30.3	28.2	28.9	29.1
RCH 530 BG II	31.9	32.9	30.9	31.9
RCH 533 BG II	31.1	30.5	29.3	30.3
VICH 5 Bt	30.6	27.7	28.4	28.9
VICH 9 Bt	30.9	28.4	27.8	29.0
Bunny (Check)	33.4	32.6	31.8	32.6
RCH 368 Bt (Check)	34.2	30.2	32.0	32.1
RCH 2 Bt (Check)	31.1	28.5	29.1	29.6

**Table 12. Micronaire**

Entry	CBE	Guntur	Dharwad	Mean
MRC 7160 BG II	5.1	5.2	4.2	4.8
MRC 7347 BG II	4.6	4.3	4.1	4.3
ACH 155-1 Bt	4.5	4.0	4.1	4.2
KDCHH 9810 Bt	4.8	4.1	4.2	4.4
KDCHH 621 BG II	4.8	4.4	4.3	4.5
RCH 530 BG II	4.9	4.2	4.6	4.6
RCH 533 BG II	5.1	4.2	4.6	4.6
VICH 5 Bt	4.7	4.6	3.9	4.4
VICH 9 Bt	4.4	4.3	4.2	4.3
Bunny (Check)	4.4	4.2	4.1	4.2
RCH 368 Bt (Check)	4.2	3.8	4.0	4.0
RCH 2 Bt (Check)	4.9	5.9	4.1	5.0

**Table 13. Uniformity ratio (%)**

Entry	CBE	Guntur	Dharwad	Mean
MRC 7160 BG II	49	53	47	50
MRC 7347 BG II	47	45	48	47
ACH 155-1 Bt	52	53	49	51
KDCHH 9810 Bt	52	49	46	49
KDCHH 621 BG II	49	50	48	49
RCH 530 BG II	49	49	49	49
RCH 533 BG II	49	50	47	49
VICH 5 Bt	49	52	50	50
VICH 9 Bt	47	49	47	48
Bunny (Check)	47	48	48	48
RCH 368 Bt (Check)	49	50	47	49
RCH 2 Bt (Check)	48	49	49	49

**Table 14. Elongation (%)**

Entry	CBE	Guntur	Dharwad	Mean
MRC 7160 BG II	5.8	6.5	6.5	6.3
MRC 7347 BG II	5.7	6.5	7.2	6.5
ACH 155-1 Bt	7.2	6.6	6.1	6.6
KDCHH 9810 Bt	7.0	6.5	6.0	6.5
KDCHH 621 BG II	7.2	6.6	6.4	6.7
RCH 530 BG II	5.8	6.6	5.8	6.1
RCH 533 BG II	6.3	6.7	6.0	6.3
VICH 5 Bt	6.4	6.6	6.1	6.4
VICH 9 Bt	6.2	6.7	6.7	6.5
Bunny (Check)	6.0	6.8	6.8	6.5
RCH 368 Bt (Check)	6.2	6.6	6.4	6.4
RCH 2 Bt (Check)	6.3	6.6	5.8	6.2



**Table 15. Fibre strength (g/tex)**

Entry	CBE	Guntur	Dharwad	Mean
MRC 7160 BG II	20.6	21.8	21.8	21.4
MRC 7347 BG II	23.4	21.0	22.4	22.3
ACH 155-1 Bt	21.0	23.6	22.0	22.2
KDCHH 9810 Bt	23.0	23.5	21.7	22.7
KDCHH 621 BG II	20.7	22.1	21.9	21.6
RCH 530 BG II	21.3	24.1	23.5	23.0
RCH 533 BG II	20.3	24.9	21.8	22.3
VICH 5 Bt	20.6	24.8	23.8	23.1
VICH 9 Bt	20.2	24.8	20.9	22.0
Bunny (Check)	22.1	24.3	22.0	22.8
RCH 368 Bt (Check)	23.4	23.8	23.2	23.5
RCH 2 Bt (Check)	20.6	21.6	23.8	22.0

**Table 16. Overall fibre properties**

Entry	2.5 % Span Length (mm)	UR %	Micronaire	Strength (g/tex)	Elongation %
MRC 7160 BG II	28.1	50	4.8	21.4	6.3
MRC 7347 BG II	31.6	47	4.3	22.3	6.5
ACH 155-1 Bt	27.5	51	4.2	22.2	6.6
KDCHH 9810 Bt	28.8	49	4.4	22.7	6.5
KDCHH 621 BG II	29.1	49	4.5	21.6	6.7
RCH 530 BG II	31.9	49	4.6	23.0	6.1
RCH 533 BG II	30.3	49	4.6	22.3	6.3
VICH 5 Bt	28.9	50	4.4	23.1	6.4
VICH 9 Bt	29.0	48	4.3	22.0	6.5
Bunny (Check)	32.6	48	4.2	22.8	6.5
RCH 368 Bt (Check)	32.1	49	4.0	23.5	6.4
RCH 2 Bt (Check)	29.6	49	5.0	22.0	6.2

## D. ENTOMOLOGICAL EVALUATION

The entomological evaluations were primarily targeted for testing the entries against the boll worms and sap sucking pests.

### 1. EVALUATION UNDER PROTECTD CONDITIONS

#### Sucking pests

##### (i). Jassids

Jassid was the predominant sap sucking pest seen throughout the season at all locations. Jassids with moderate intensity were seen throughout the season at Coimbatore, Guntur and Nandyal. At Siruguppa, the incidence was more at 27 DAS.

At Dharwad, the incidence was more prevalent between 30 DAS and 60 DAS. The mean population of Jassids recorded at different centres is given in Table 17.

**Table 17. Jassids population/ Plant**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad
MRC 7160 BG II	2.5	4.9	1.5	3.4	5.83
MRC 7347 BG II	2.2	5.1	1.5	2.3	6.37
ACH 155-1 Bt	2.7	5.2	1.0	2.0	5.67
KDCHH 9810 Bt	3.2	6.4	1.9	1.9	5.23
KDCHH 621 BG II	2.4	6.1	1.4	3.4	5.03
RCH 530 BG II	3.3	6.6	2.0	4.3	5.1
RCH 533 BG II	2.9	6.9	2.4	3.4	6.1
VICH 5 Bt	3.7	5.6	1.6	3.7	5.77
VICH 9 Bt	2.1	6.8	1.3	3.1	4.93
Bunny (Check)	2.7	6.3	1.3	3.4	7.43
RCH 368 Bt (Check)	2.9	5.7	1.3	2.9	4.87
RCH 2 Bt (Check)	2.6	8.3	2.1	4.0	5.67

**(ii). Thrips**

Thrips incidence was severe at Siruguppa at 45 DAS and at Dharwad between 45 and 60 DAS. The incidence was moderate at other places (Table 18).

**Table 18. Thrips population/ Plant**

Entry	Siruguppa	Guntur	Nandyal	Dharwad
MRC 7160 BG II	56.03	5.26	9.36	28.9
MRC 7347 BG II	21.33	5.56	8.06	28.97
ACH 155-1 Bt	37.33	7.09	10.31	34.03
KDCHH 9810 Bt	19.73	6.69	9.69	29.77
KDCHH 621 BG II	37.40	6.61	9.58	28.6
RCH 530 BG II	23.73	5.14	9.39	27.57
RCH 533 BG II	18.00	4.94	5.73	26.33
VICH 5 Bt	27.60	7.53	12.90	30.17
VICH 9 Bt	36.40	8.42	12.15	27.27
Bunny (Check)	31.47	5.08	5.43	28.43
RCH 368 Bt (Check)	28.27	6.96	12.24	30.13
RCH 2 Bt (Check)	10.73	4.09	7.02	28.63

**(iii). Aphids**

Aphids were observed only at Coimbatore, Guntur and Dharwad. The incidence was heavy in Coimbatore (Table 19).

**Table 19. Aphids population/ Plant**

Entry	CBE	Guntur	Dharwad
MRC 7160 BG II	21.24	1.74	2.83
MRC 7347 BG II	25.71	5.13	1.63
ACH 155-1 Bt	21.53	1.01	3.2
KDCHH 9810 Bt	13.15	2.08	2
KDCHH 621 BG II	22.50	5.02	2.67
RCH 530 BG II	21.14	3.68	1.23
RCH 533 BG II	20.02	2.47	1.9
VICH 5 Bt	15.76	2.27	1.4
VICH 9 Bt	17.47	1.24	1.2
Bunny (Check)	27.23	1.92	1.57
RCH 368 Bt (Check)	23.88	4.24	1.77
RCH 2 Bt (Check)	19.53	1.39	1.77

**(iv). Whitefly**

Whitefly incidence was low and did not cross ETL levels at any location (Table 20).

**Table 20. Whitefly population/ Plant**

Entry	Siruguppa	Guntur	Nandyal	Dharwad
MRC 7160 BG II	0.47	3.62	2.94	3.6
MRC 7347 BG II	0.67	2.27	0.92	2.8
ACH 155-1 Bt	0.87	3.61	1.33	2.8
KDCHH 9810 Bt	1.40	3.56	0.87	2.2
KDCHH 621 BG II	1.00	3.37	1.43	4
RCH 530 BG II	1.53	1.26	0.95	3.2
RCH 533 BG II	1.80	1.17	0.74	2.8
VICH 5 Bt	1.33	4.20	1.27	2.8
VICH 9 Bt	0.87	2.44	1.34	2.4
Bunny (Check)	0.73	2.10	0.83	2.6
RCH 368 Bt (Check)	0.80	2.20	0.98	3
RCH 2 Bt (Check)	1.33	1.39	0.62	2.2

**Natural Enemies**

In general, the population of natural enemies was low in the test centres. The coccinellid grubs and adults were the main natural enemy population noticed. However, there was no discernible difference between the non Bt check hybrid Bunny and the other Bt entries in harbouring the natural enemies (Table 21).

**Table 21. Natural Enemies population /Plant**

Entry	Siruguppa	Nandyal	Dharwad
MRC 7160 BG II	0.33	1.0	0.4
MRC 7347 BG II	0.20	0.5	0.4
ACH 155-1 Bt	0.17	0.5	0.4
KDCHH 9810 Bt	0.10	1.0	0.3
KDCHH 621 BG II	0.20	1.0	0.3
RCH 530 BG II	0.00	0.2	0.5
RCH 533 BG II	0.33	0.3	0.4
VICH 5 Bt	0.20	0.7	0.5
VICH 9 Bt	0.27	0.8	0.5
Bunny (Check)	0.07	0.6	0.4
RCH 368 Bt (Check)	0.20	0.5	0.4
RCH 2 Bt (Check)	0.07	0.6	0.6

**Boll worms****Larval Population**

The larval population of *Helicoverpa armigera* was noticed at Dharwad and was significant only at 110 DAS (Table 22).

**Table 22. Larval population of *Helicoverpa armigera* at Dharwad (No./ 5 plants)**

Entry	90 DAS		110 DAS		120 DAS		150 DAS	
	OV	TV	OV	TV	OV	TV	OV	TV
MRC 7160 BG II	1.67	1.63	5.50	2.54	3.33	2.08	2.00	1.73
MRC 7347 BG II	3.00	2.00	4.90	2.42	1.67	1.63	1.67	1.63
ACH 155-1 Bt	3.60	2.11	5.05	2.45	3.33	2.08	4.33	2.30
KDCHH 9810 Bt	1.40	1.54	6.40	2.72	3.33	2.08	1.67	1.63
KDCHH 621 BG II	5.50	2.54	7.80	2.95	1.67	1.63	0.00	1.00
RCH 530 BG II	6.20	2.68	8.40	3.12	1.67	1.63	5.00	2.45
RCH 533 BG II	1.40	1.53	6.70	2.77	5.00	2.45	2.33	1.82
VICH 5 Bt	4.60	2.36	4.00	2.23	3.33	2.08	1.67	1.63
VICH 9 Bt	1.40	1.53	5.00	2.45	1.67	1.63	5.00	2.45
Bunny (Check)	3.33	2.08	5.00	2.45	0.00	1.00	3.67	2.16
RCH 368 Bt (Check)	2.40	1.83	6.50	2.73	8.33	3.06	3.33	2.08
RCH 2 Bt (Check)	2.00	1.73	5.55	2.55	1.67	1.63	5.00	2.45
F Test	NS		S		NS		NS	
CD (P=0.05)			1.05					
CV%			19.50					

The incidence was very low at Coimbatore and varied from 0 to 0.5 larva/plant.

The incidence of Pink bollworm larvae remained low even up to 160 days. Comparatively, the incidence was more on the non Bt check hybrid Bunny at Guntur and Dharwad (Table 23).

**Table 23. *Pectinophora gossypiella* no. of larvae/20 green bolls**

Entry	CBE		Guntur		Dharwad
	O.V	T.V	O.V	T.V	
MRC 7160 BG II	0.00	0.22	0.00	1.00	0.67
MRC 7347 BG II	0.00	0.22	1.33	1.41	0.92
ACH 155-1 Bt	0.00	0.22	0.33	1.14	0.61
KDCHH 9810 Bt	0.00	0.22	0.00	1.00	0.73
KDCHH 621 BG II	0.33	0.49	0.00	1.00	0.89
RCH 530 BG II	0.33	0.49	0.00	1.00	0.59
RCH 533 BG II	0.00	0.22	0.00	1.00	0.61
VICH 5 Bt	0.33	0.49	0.00	1.00	1.23
VICH 9 Bt	0.00	0.22	0.00	1.00	0.84
Bunny (Check)	0.33	0.49	4.00	2.22	1.45
RCH 368 Bt (Check)	0.33	0.49	0.33	1.13	1.08
RCH 2 Bt (Check)	0.00	0.22	0.00	1.00	0.97
CD at 5%	-	0.48		0.42	-
CV %	-	87.90		21.80	-

### Square Damage

Square Damage at Guntur was noticed only around 85 DAS and thereafter it was totally insignificant. The non Bt check hybrid recorded a square damage of 4.77 per cent. RCH 2 Bt check hybrid recorded a square damage of 5.12 per cent. All the test entries recorded low square damage (Table 24).

**Table 24. Square damage at Guntur**

Entry	69 DAS	85 DAS	118DAS	134DAS
MRC 7160 BG II	0.00	0.56 (2.50)	0.00	0.00
MRC 7347 BG II	0.00	1.22 (5.12)	0.54 (2.42)	0.00
ACH 155-1 Bt	0.78 (2.91)	2.23 (5.00)	0.00	0.00
KDCHH 9810 Bt	0.00	0.00 (0.00)	0.00	0.00
KDCHH 621 BG II	0.00	0.00 (0.00)	0.00	0.00
RCH 530 BG II	0.00	1.17 (5.01)	0.00	0.00
RCH 533 BG II	0.00	0.45 (2.18)	0.00	0.00
VICH 5 Bt	0.00	1.16 (2.06)	0.00	0.00
VICH 9 Bt	0.00	1.29 (3.80)	0.00	0.00
Bunny (Check)	0.00	4.77 (10.27)	0.00	0.00
RCH 368 Bt (Check)	0.00	0.71 (2.78)	0.00	0.00
RCH 2 Bt (Check)	0.00	5.12 (12.76)	0.00	0.00
F Test	NS	Sig.	NS	-
C.D 5%	-	8.64	-	-
CV%	624.50	96.70	624.50	-

At Nandyal, the square damage was maximum around 90 days and required chemical intervention (Table 25).

**Table 25. Square damage at Nandyal**

Entry	Observations				
	70 DAS	80DAS	90DAS	100 DAS	110DAS
MRC 7160 BG II	8.52(2.78)	3.93(2.20)	15.09(3.91)	7.17(2.72)	5.01(2.29)
MRC 7347 BG II	3.06(1.71)	7.75(1.51)	22.64(4.76)	8.57(2.64)	10.11(3.17)
ACH 155-1 Bt	8.16(2.88)	1.22(1.15)	19.94(4.52)	11.65(3.47)	2.02(1.32)
KDCHH 9810 Bt	3.85(2.58)	5.72(2.06)	16.12(4.04)	3.57(1.58)	3.60(1.81)
KDCHH 621 BG II	6.47(2.60)	2.20(1.61)	15.62(4.00)	1.66(1.25)	5.44(2.42)
RCH 530 BG II	3.83(1.89)	2.12(1.47)	9.38(3.13)	1.70(1.26)	3.84(2.02)
RCH 533 BG II	4.26(2.08)	2.94(1.76)	13.66(3.71)	1.80(1.28)	4.89(2.10)
VICH 5 Bt	9.75(3.14)	4.84(2.29)	14.37(3.83)	11.73(3.49)	4.97(2.05)
VICH 9 Bt	7.84(2.79)	4.80(2.19)	13.08(3.67)	1.55(1.22)	2.53(1.58)
Bunny (Check)	13.68(3.62)	18.09(4.29)	12.87(3.62)	14.03(3.75)	10.90(3.36)
RCH 368 Bt (Check)	4.39(1.99)	3.56(1.95)	15.23(3.95)	2.13(1.51)	6.92(2.64)
RCH 2 Bt (Check)	6.18(2.52)	7.76(2.78)	16.50(4.11)	8.99(3.01)	2.55(1.96)
F Test	S	S	S	S	S
S.Ed	0.86	0.56	0.43	0.77	0.60
C.D 5%	1.77	1.16	0.89	1.58	1.25
C.V%	42.82	30.89	13.24	40.39	33.07

Values in parenthesis are arcsine transformed

The square damage at Siruguppa was maximum at 65 DAS. The mean square damage recorded at various centres is given in Table 26.

**Table 26. Square damage (%)**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad
MRC 7160 BG II	0.60	8.90	0.14	5.65	4.07
MRC 7347 BG II	0.43	12.80	0.44	7.99	3.66
ACH 155-1 Bt	0.76	14.56	0.75	6.71	2.86
KDCHH 9810 Bt	0.33	13.10	0.00	4.75	3.74
KDCHH 621 BG II	0.50	11.35	0.00	4.71	7.69
RCH 530 BG II	0.63	10.81	0.29	3.99	7.12
RCH 533 BG II	0.60	14.72	0.11	4.09	4.15
VICH 5 Bt	0.50	12.89	0.29	6.99	3.27
VICH 9 Bt	0.43	11.81	0.32	4.77	4.24
Bunny (Check)	0.20	13.61	1.19	11.50	3.46
RCH 368 Bt (Check)	0.00	13.80	0.18	4.64	3.89
RCH 2 Bt (Check)	0.70	12.12	1.28	6.13	4.27

### Green boll damage

Green boll damage was more at Siruguppa as compared to Nandyal but occurred late. Green boll damage in some of the Bt cotton hybrids was as high as in Non Bt check hybrid Bunny (Table 27).

**Table 27. Green boll damage (%)**

Entry	Siruguppa	Nandyal
MRC 7160 BG II	16.67	0.18
MRC 7347 BG II	20.00	1.37
ACH 155-1 Bt	7.50	1.65
KDCHH 9810 Bt	10.84	2.36
KDCHH 621 BG II	16.67	0.95
RCH 530 BG II	17.50	1.24
RCH 533 BG II	19.17	0.37
VICH 5 Bt	19.17	0.68
VICH 9 Bt	10.83	0.71
Bunny (Check)	20.00	0.83
RCH 368 Bt (Check)	18.33	4.84
RCH 2 Bt (Check)	15.84	0.72

Green boll damage due to Pink bollworm was assessed through destructive sampling and was more at Dharwad than at Coimbatore and Guntur. At Guntur, the non Bt check hybrid Bunny recorded the maximum boll damage of 18.33 per cent followed by 6.7 per cent in MRC 7347 BG II. Other Bt hybrids recorded very low damage. At Dharwad, the damage was seen uniformly on all hybrids and varied from 10.62 to 20.36 per cent (Table 28).

**Table 28. *Pectinophora gossypiella* - Green boll damage (%)**

Entry	CBE		Guntur		Dharwad
	O.V	T.V	O.V	T.V	
MRC 7160 BG II	1.66	4.30	0.00	0.0	11.54
MRC 7347 BG II	0.00	0.00	6.67	11.8	10.62
ACH 155-1 Bt	1.66	4.30	1.67	6.2	13.07
KDCHH 9810 Bt	0.00	0.00	0.00	0.0	13.92
KDCHH 621 BG II	0.00	0.00	0.00	0.0	17.18
RCH 530 BG II	0.00	0.00	0.00	0.0	14.66
RCH 533 BG II	1.66	4.30	0.00	0.0	14.28
VICH 5 Bt	0.00	0.00	0.00	0.0	20.07
VICH 9 Bt	1.66	4.30	0.00	0.0	16.89
Bunny (Check)	0.00	0.00	18.33	25.3	20.36
RCH 368 Bt (Check)	1.66	4.30	1.67	4.3	17.16
RCH 2 Bt (Check)	0.00	0.00	1.67	4.2	18.1
CD at 5%	7.16		9.0		
CV %	268.14		134.1		

### Open boll damage (%)

Open boll damage at harvest was minimum at Coimbatore and Guntur. At Guntur, however, the non Bt check hybrid Bunny recorded 13.33 per cent boll damage. At Siruguppa, Nandyal and Dharwad, the percentage of damage was more. Even the Bt hybrids recorded considerable damage (Table 29).

**Table 29. Open boll damage at harvest (%)**

Entry	CBE		Siruguppa	Guntur		Nandyal		Dharwad	
	O.V	T.V		O.V	T.V	O.V	T.V	O.V	T.V
MRC 7160 BG II	1.67	7.33	19.71	0.00	0.00	29.79	32.59	30.15	33.32
MRC 7347 BG II	1.33	5.85	17.48	1.67	4.31	19.17	25.77	37.75	37.93
ACH 155-1 Bt	1.00	5.74	16.16	1.67	4.31	24.21	29.46	31.1	33.8
KDCHH 9810 Bt	0.33	2.77	14.94	0.00	0.00	32.90	34.74	28.61	32.35
KDCHH 621 BG II	1.00	4.18	20.11	0.00	0.00	41.08	39.52	43.61	41.35
RCH 530 BG II	0.67	3.56	20.35	0.00	0.00	19.05	25.87	31.6	34.22
RCH 533 BG II	0.00	1.28	22.64	0.00	0.00	25.65	30.08	43.21	41.12
VICH 5 Bt	1.67	6.19	18.43	0.00	0.00	26.45	30.16	34.04	35.71
VICH 9 Bt	2.67	7.89	16.24	0.00	0.00	31.25	33.90	37.12	37.56
Bunny (Check)	0.67	3.56	27.36	13.33	21.34	38.25	38.15	51.65	45.97
RCH 368 Bt (Check)	1.00	5.74	17.39	0.00	0.00	25.00	28.68	31.37	34.08
RCH 2 Bt (Check)	0.33	2.77	17.42	0.00	0.00	17.06	24.26	39.21	38.79
CD at 5%	7.57		4.56	5.20		12.50		4.50	

### Locule Damage %

The trend in locule damage was also similar to open boll damage. The non Bt check hybrid Bunny recorded the highest locule damage. Considerable locule damage was seen in Bt hybrids also (Table 30).

**Table 30. Locule damage (%)**

Entry	CBE		Siruguppa	Guntur		Nandyal		Dharwad	
	O.V	T.V		O.V	T.V	O.V	T.V	O.V	T.V
MRC 7160 BG II	0.67	3.56	14.00	0.00	0.00	14.74	22.43	6.76	15.08
MRC 7347 BG II	0.00	1.28	9.53	0.82	2.97	15.67	23.20	7.15	15.52
ACH 155-1 Bt	1.33	5.85	8.60	0.43	2.18	20.25	26.73	6.19	14.41
KDCHH 9810 Bt	0.00	1.28	7.07	0.00	0.00	15.00	22.73	6.15	14.37
KDCHH 621 BG II	0.67	3.56	9.70	0.00	0.00	28.26	31.62	9	17.47
RCH 530 BG II	1.67	5.16	13.00	0.00	0.00	13.73	21.63	6.1	14.31
RCH 533 BG II	2.33	8.75	11.43	0.00	0.00	27.50	31.63	4.39	12.1
VICH 5 Bt	1.00	4.18	11.50	0.00	0.00	14.59	22.43	6.34	14.59
VICH 9 Bt	0.67	3.56	11.80	0.00	0.00	23.86	29.09	6.27	14.51
Bunny (Check)	1.00	4.18	15.80	6.69	14.86	29.44	32.34	10.18	18.62
RCH 368 Bt (Check)	1.67	5.16	9.93	0.00	0.00	11.93	18.90	6.29	14.53
RCH 2 Bt (Check)	2.33	7.60	11.00	0.00	0.00	11.99	20.12	6.21	14.44
CD at 5%	3.72		3.84	3.19		9.31		3.9	



### Plant Protection measures

Jassids, aphids and thrips were the predominant sucking pests noticed. Myrid Bug was noticed at Dharwad. All the entries tested including the check hybrids were susceptible to these pests at varying degrees and at different stages of crop growth at all the locations, warranting chemical intervention at varying frequencies (Table 31).

**Table 31. No. of spray for sucking pests**

Entry	Siruguppa	Guntur	Nandyal	Dharwad
MRC 7160 BG II	3	2	3	2
MRC 7347 BG II	3	1	3	2
ACH 155-1 Bt	3	1	3	2
KDCHH 9810 Bt	3	3	2	2
KDCHH 621 BG II	3	1	3	2
RCH 530 BG II	3	1	3	2
RCH 533 BG II	3	1	3	2
VICH 5 Bt	3	2	3	2
VICH 9 Bt	3	0	3	2
Bunny (Check)	3	0	3	2
RCH 368 Bt (Check)	3	0	3	2
RCH 2 Bt (Check)	3	1	3	2

Bollworm damage was very negligible at Coimbatore and did not warrant any chemical intervention even on non Bt check hybrid Bunny. At Guntur, Bunny and four Bt entries required chemical intervention once. At Nandyal, maximum of four interventions were required for non Bt check hybrid Bunny. Bt check hybrids required two interventions. RCH 530 BG II and RCH 533 BG II did not require any chemical intervention. At Dharwad, all the entries required one to two rounds of chemical application to keep the pests in check (Table 32).

**Table 32. No. of spray for bollworms**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad
MRC 7160 BG II	0	3	0	2	1
MRC 7347 BG II	0	3	0	4	1
ACH 155-1 Bt	0	3	1	2	1
KDCHH 9810 Bt	0	3	0	1	1
KDCHH 621 BG II	0	3	1	1	2
RCH 530 BG II	0	3	0	0	2
RCH 533 BG II	0	3	0	0	1
VICH 5 Bt	0	3	0	2	1
VICH 9 Bt	0	3	0	2	1

Bunny (Check)	0	3	1	4	1
RCH 368 Bt (Check)	0	3	0	2	1
RCH 2 Bt (Check)	0	3	1	2	1

## 2. EVALUATION UNDER UNPROTECTED CONDITIONS

All the ten entries in the trial were also evaluated under unsprayed conditions for bollworms. However, they were protected against sucking pests.

The open boll and locule damage were assessed at harvest. Open boll damage was less than four per cent at Coimbatore and Guntur. However, at Siruguppa, Nandyal and Dharwad, it varied from 17.6 per cent to 61.9 per cent. Even though the open boll damage was more on non Bt check hybrid Bunny, the Bt entries including the check hybrids suffered considerable damage (Table 33).

**Table 33. Open boll damage at harvest (%)**

Entry	CBE		Siruguppa	Guntur	Nandyal		Dharwad	
	O.V	T.V			O.V	T.V	O.V	T.V
MRC 7160 BG II	2.33	8.75	26.13	0.00	30.81	33.27	40.99	39.83
MRC 7347 BG II	2.00	7.95	25.30	0.35	20.71	26.94	50.48	45.3
ACH 155-1 Bt	1.33	6.54	21.99	0.00	25.79	30.50	35.05	36.32
KDCHH 9810 Bt	1.00	5.05	17.60	0.00	34.62	35.80	39.64	39.04
KDCHH 621 BG II	1.67	6.19	25.69	0.00	44.45	39.77	61.9	51.91
RCH 530 BG II	1.00	5.05	27.63	0.00	20.39	26.84	38.6	38.43
RCH 533 BG II	0.00	1.28	27.85	0.00	37.02	37.42	51.19	45.71
VICH 5 Bt	1.00	4.18	22.92	0.00	28.47	31.59	44.05	41.6
VICH 9 Bt	2.00	7.67	21.94	0.00	32.64	34.71	49.1	44.51
Bunny (Check)	0.33	2.77	29.18	3.51	41.07	39.82	61.65	51.76
RCH 368 Bt (Check)	1.00	5.05	26.90	0.31	26.34	29.85	50.4	45.25
RCH 2 Bt (Check)	1.00	5.05	23.95	0.00	18.40	25.33	48.25	44.02
CD at 5%	5.03		6.59	2.21	11.97		10.67	
CV %	55.65		15.43	117.30	21.81		14.94	

The locule damage also followed the same trend of open boll damage. Both Bt and non Bt hybrids recorded considerable locule damage at Siruguppa, Nandyal and Dharwad (Table 34).

**Table 34. Locule damage (%)**

Entry	CBE		Siruguppa	Guntur	Nandyal		Dharwad	
	O.V	T.V			O.V	T.V	O.V	T.V
MRC 7160 BG II	0.67	3.56	11.67	0.00	15.75	23.25	7.92	16.35
MRC 7347 BG II	0.33	2.77	14.27	0.08	17.34	24.49	8.63	17.09
ACH 155-1 Bt	0.00	1.28	13.17	0.00	22.43	28.11	7.02	15.37

KDCHH 9810 Bt	0.00	1.28	11.07	0.00	16.07	23.58	8.29	16.74
KDCHH 621 BG II	1.00	5.05	17.60	0.00	29.25	32.30	11.07	19.45
RCH 530 BG II	0.33	2.77	15.30	0.00	15.77	23.32	6.29	14.53
RCH 533 BG II	1.67	7.33	14.47	0.00	28.86	32.49	6.87	15.2
VICH 5 Bt	1.00	5.05	16.97	0.00	15.93	23.51	7.42	15.82
VICH 9 Bt	0.67	3.56	17.30	0.00	25.43	30.18	8.31	16.76
Bunny (Check)	1.33	6.54	22.57	1.57	30.11	32.66	16.01	23.6
RCH 368 Bt (Check)	1.67	6.19	19.77	0.08	13.95	21.04	6.9	15.23
RCH 2 Bt (Check)	2.67	9.08	15.00	0.00	13.66	21.54	4.33	12.02
CD at 5%	4.99		3.41	0.82	9.25		6.07	
CV %	69.10		12.53	77.30	20.80		23.15	

## E. MEAN SEED COTTON YIELD UNDER UNPROTECTED CONDITIONS

### (i) Irrigated

The non Bt check hybrid Bunny recorded a mean seed cotton yield of 1835 kg/ha. As many as six test hybrids recorded higher seed cotton yield than Bunny (check). The increase in seed cotton yield ranged from 9 to 32.5 per cent (Table 35).

Among the Bt check hybrids, RCH 368 Bt recorded the highest mean seed cotton yield of 2252 kg/ha. Only ACH 155-1 Bt, with a mean seed cotton yield of 2432 kg/ha, was superior to it by 8.0 per cent. VICH 9 Bt, KDCHH 9810 Bt, VICH 5 Bt, RCH 533 BG II and MRC 7347 BG II were, however, superior to RCH 2 Bt (Bt check) and Bunny (non Bt check).

### (ii). Rainfed

Under rainfed situations, the non Bt check hybrid Bunny recorded the lowest yield of 805 kg/ha and RCH 2 Bt (Bt check) recorded the highest yield of 1907 kg/ha. The test hybrids MRC 7160 BG II, KDCHH 9810 Bt, RCH 530 BG II, RCH 533 BG II, ACH 155-1 Bt and VICH 9 Bt were superior to RCH 368 Bt (Bt check) and Bunny (non Bt check) (Table 35).

**Table 35. Seed cotton yield (Kg/ha) under unprotected conditions**

Entry	Irrigated			Rainfed			
	CBE	Siruguppa	Mean	Guntur	Nandyal	Dharwad	Mean
MRC 7160 BG II	1584	1859	1722	2232	1508.7	1326	1689
MRC 7347 BG II	1833	2166	2000	1593	1284.3	1224	1367
ACH 155-1 Bt	2003	2861	2432	1698	1443.2	1355	1499
KDCHH 9810 Bt	1615	2573	2094	1736	1575.7	1494	1602
KDCHH 621 BG II	1447	1564	1506	1407	860.8	468	912
RCH 530 BG II	1449	2139	1794	1957	1295.6	1456	1570
RCH 533 BG II	1573	2552	2063	1937	810.1	1786	1511
VICH 5 Bt	1647	2499	2073	1472	854.6	1339	1222

VICH 9 Bt	1730	2622	2176	1791	986.8	1601	1460
Bunny (Check)	1794	1876	1835	1439	257.5	718	805
RCH 368 Bt (Check)	2003	2500	2252	1630	781.5	1288	1233
RCH 2 Bt (Check)	1550	2398	1974	2285	1563.9	1873	1907
CD at 5%	384	512	-	NS	696	569.4	-
CV %	13.7	13.45	-	19.7	30	25.5	-

## F. PATHOLOGICAL EVALUATIONS

### Alternaria leaf spot

This disease was noticed in the severe form in three centres *viz.*, Guntur, Dharwad and Siruguppa with the incidence ranging from 20.0 to 31.5 per cent and all the test entries as well as the check hybrids were found susceptible. Even at low disease pressure at Coimbatore none of the hybrid was free from the disease (Table 36).

### Bacterial leaf blight

Bacterial blight was observed only at Dharwad and Siruguppa where there was moderate to high incidence of the disease. All the hybrids were affected by the disease with the incidence ranging from 7.92 to 31.52 per cent (Table 36).

**Table 36. Alternaria leaf spot and Bacterial leaf blight incidences on Bt cotton**

Entries	Alternaria leaf spot							Bacterial leaf blight			
	CBE	Guntur		Dharwad		Siruguppa		Dharwad		Siruguppa	
		O.V	T.V	O.V	T.V	O.V	T.V	O.V	T.V	O.V	T.V
MRC 7160 BG II	3.6	26.2	30.7	29.3	32.8	30.1	33.3	27.3	31.5	12.2	20.4
MRC 7347 BG II	2.3	31.5	34.1	29.3	32.8	30.0	33.2	29.1	32.7	11.1	19.5
ACH 155-1 Bt	3.3	23.5	28.9	29.1	32.7	28.3	32.1	31.5	34.1	8.8	17.3
KDCHH 9810 Bt	2.6	26.1	30.6	27.7	31.8	28.5	32.2	29.1	32.7	8.7	17.2
KDCHH 621 BG II	3.5	32.6	41.5	28.7	32.4	26.4	30.9	28.2	32.1	8.6	17.1
RCH 530 BG II	2.4	28.0	30.9	29.1	32.7	25.6	30.4	22.8	28.5	9.1	17.6
RCH 533 BG II	2.4	25.6	30.3	29.3	32.8	24.0	29.3	28.7	32.4	8.0	16.4
VICH 5 Bt	3.9	24.3	29.5	30.2	33.3	27.0	31.3	29.8	33.1	8.2	16.6
VICH 9 Bt	3.3	26.5	30.9	30.3	33.4	28.1	32.0	27.7	31.8	9.2	17.7
Bunny (Check)	4.3	20.0	26.4	22.7	28.5	25.6	30.4	26.1	30.7	8.0	16.4
RCH 368 Bt (Check)	4.6	25.3	30.2	29.0	32.7	29.4	32.8	26.3	30.9	7.9	16.3
RCH 2 Bt (Check)	3.7	22.3	34.6	29.3	32.8	24.3	29.5	27.4	31.6	8.6	17.1
C.D at 5%		7.2		NS		NS		NS		NS	
C.V.		13.7		7.3		6.4		8.9		9.9	

### Grey mildew

At low disease pressure in Coimbatore only three test entries *viz.*, ACH 155-1 Bt, VICH 5 Bt and VICH 9 Bt as well as the check hybrid Bunny were found susceptible and rest of the test entries were free from grey mildew. However, at high

disease pressure at Guntur, Dharwad and Siruguppa, all entries including the check hybrids were found susceptible with incidence ranging from 15.67 to 35.51 per cent (Table 37).

**Table 37. Incidence of Grey mildew on Bt cotton**

Entries	Grey mildew						
	CBE	Guntur		Dharwad		Siruguppa	
		O.V	T.V	O.V	T.V	O.V	T.V
MRC 7160 BG II	0.0	17.4	32.6	27.3	31.5	35.5	36.6
MRC 7347 BG II	0.0	26.2	30.7	26.3	30.9	33.2	35.2
ACH 155-1 Bt	12.3	24.7	29.8	29.9	33.2	33.8	35.6
KDCHH 9810 Bt	0.0	20.7	27.0	29.0	32.6	35.1	36.3
KDCHH 621 BG II	0.0	22.5	28.3	27.8	31.8	34.3	35.9
RCH 530 BG II	0.0	15.7	23.3	27.8	31.9	32.4	34.7
RCH 533 BG II	0.0	25.3	30.3	30.2	33.3	34.1	35.7
VICH 5 Bt	12.5	16.5	23.9	32.7	34.9	34.4	35.9
VICH 9 Bt	12.5	24.7	29.7	27.2	31.4	35.4	36.5
Bunny (Check)	10.0	28.7	32.4	32.3	32.2	31.8	34.3
RCH 368 Bt (Check)	0.0	21.5	27.5	27.3	31.5	34.3	35.9
RCH 2 Bt (Check)	0.0	24.7	29.8	29.1	32.7	33.0	35.1
C.D at 5%		4.2		NS		NS	
C.V.		8.6		8.1		5.9	

## G. OVERALL ASSESSMENT

Nine Bt cotton hybrids were evaluated under both protected and unprotected conditions along with Bunny (non Bt check), RCH 368 and RCH 2 (Bt checks). The trial was conducted at Coimbatore and Siruguppa under irrigated conditions and at Guntur, Nandyal and Dharwad under rainfed conditions.

As indicated by larval population, square and boll damage, the bollworm incidence was low at Coimbatore and Guntur. The incidence was moderate at Nandyal, Dharwad and Siruguppa. The open boll and locule damage was also fairly high in these places. Considerable amount of damage was also noticed on Bt hybrids warranting minimum chemical intervention.

Jassids, Thrips and Aphids were prevalent and all the entries tested were found to be susceptible at varying levels and warranted chemical intervention more than once to contain them.

Under high disease pressure, all the entries including the check hybrids were found to be susceptible to Alternaria leaf spot, grey mildew and bacterial leaf blight.

Under irrigated conditions, test entries ACH 155-1 and VICH 9 were superior to all the three check hybrids under protected conditions. However, under unprotected conditions, only ACH 155-1 was superior. In addition, KDCHH 9810 Bt and RCH 533 BG II were found superior, when compared with only two check hybrids (Bunny and RCH 2 Bt) under both protected and unprotected conditions.

Under rainfed conditions, none of the test hybrids was superior to all the three check hybrids. When compared with only two check hybrids (Bunny and RCH 368 Bt), the test entry RCH 533 BG II alone was superior under both protected and unprotected conditions.

## SECOND YEAR INTRA HIRSUTUM HYBRID EVALUATION

Twenty six Bt cotton hybrids were evaluated for the second year in succession for confirmatory results. The hybrids evaluated are:

- i) RCH 111 Bt and RCH 371 Bt from RASI Seeds
- ii) MRC 6100 Bt, MRC 7228 BG II and MRC 7351 BG II from MAHYCO Seeds
- iii) NCS 913 Bt from Nuziveedu Seeds
- iv) JKCH 99 Bt, JKCH 10 Bt and JKCH 634 Bt from JK Seeds
- v) NCEH 2R Bt and NCEH 3R Bt from Nath Seeds
- vi) Tulasi 4 Bt and Tulasi 117 Bt from Tulasi Seeds
- vii) NPH 2270 Bt and NPH 2171 Bt from Prabhat Seeds
- viii) Brahma Bt and Dhanwan Bt from Emergent Genetics
- ix) GK 207 Bt and GK 209 Bt from Ganga Kaveri Seeds
- x) ACH 33-1 Bt, ACH 11-1 Bt and ACH 21-1 Bt from Ajeet Seeds
- xi) KDCHH 9632 Bt and KDCHH 441 BG II from Krishidhan Seeds and
- xii) PRCH 102 Bt and PRCH 103 Bt from Pravardhan Seeds

There were three checks in the trial. Bunny was the non Bt check hybrid. RCH 2 Bt and RCH 368 Bt were the Bt check hybrids.

### A. BIOMETRICAL EVALUATION

Biometrical evaluations of the twenty six Bt test entries along with three check hybrids were made in the ETL based plant protection Trial.

#### Germination and Final Plant Stand

Germination and final plant stand were satisfactory.

**Table 1. Germination (%) and final plant stand (Number)**

Entry	Germination (%)			Plant stand		
	Siruguppa	Nandyal	Mean	Siruguppa	Nandyal	Mean
RCH 111 Bt	96.7	94.9	95.8	29.0	32.3	30.7
RCH 371 Bt	94.4	98.9	96.7	28.3	33.0	30.7
MRC6100 Bt	96.7	97.9	97.3	29.0	32.7	30.9
MRC 7228BGII	98.9	87.8	93.3	29.7	33.0	31.3
MRC 7351 BGII	100.0	98.9	99.5	30.0	33.0	31.5
NCS 913 Bt	93.3	98.9	96.1	28.0	32.7	30.4
JKCH 99 Bt	93.3	98.9	96.1	28.0	32.3	30.2
JKCH 10 Bt	87.8	76.7	82.2	26.3	31.7	29.0

JKCH 634 Bt	75.6	88.8	82.2	22.7	33.0	27.8
NCEH 2R Bt	100.0	93.9	97.0	30.0	33.0	31.5
NCEH 3R BT	95.6	93.9	94.7	28.7	33.0	30.8
Tulasi 4 Bt	98.9	99.9	99.4	29.7	32.7	31.2
Tulasi 117 Bt	90.0	98.9	94.5	27.0	33.0	30.0
NPH 2270 Bt	95.6	95.9	95.7	28.7	32.3	30.5
NPH 2171 Bt	96.7	98.9	97.8	29.0	32.3	30.7
Brahma Bt	97.8	97.9	97.8	29.3	33.0	31.2
Dhanwan Bt	98.9	97.9	98.4	29.7	33.0	31.3
GK 207 Bt	95.6	94.9	95.2	28.7	33.0	30.8
GK 209 Bt	95.6	99.9	97.7	28.7	33.0	30.8
ACH 33-1Bt	92.2	98.9	95.6	27.7	33.0	30.3
ACH 11-1Bt	94.4	96.9	95.7	28.3	33.0	30.7
ACH 21-1Bt	98.9	97.9	98.4	29.7	33.0	31.3
KDCHH 9632 Bt	96.7	92.9	94.8	29.0	33.0	31.0
KDCHH 441 BG II	71.1	79.7	75.4	21.3	32.3	26.8
PRCH 102 Bt	96.7	98.9	97.8	29.0	32.7	30.9
PRCH 103 Bt	94.4	99.9	97.2	28.3	32.7	30.5
Bunny (Check)	91.1	97.9	94.5	27.3	33.0	30.2
RCH 2Bt (Check)	100.0	97.9	99.0	30.0	32.7	31.4
RCH 368Bt (Check)	97.8	95.9	96.8	29.3	33.0	31.2

### First and Fifty percent flowering

Flowering was, in general, earlier at Guntur than at Coimbatore and Nandyal. There was not much variation in flowering between entries in the trial (Table 2 and 3).

**Table 2. First flowering (days)**

Entry	CBE	Guntur	Nandyal	Mean
RCH 111 Bt	61.0	46.0	51.7	52.9
RCH 371 Bt	61.0	47.0	51.7	53.2
MRC6100 Bt	56.0	45.0	50.0	50.3
MRC 7228BGII	55.0	46.0	51.0	50.7
MRC 7351 BGII	55.0	47.0	50.0	50.7
NCS 913 Bt	57.0	46.0	51.0	51.3
JKCH 99 Bt	56.0	46.0	51.7	51.2
JKCH 10 Bt	58.0	45.0	51.7	51.6
JKCH 634 Bt	55.0	46.0	51.0	50.7
NCEH 2R Bt	55.0	47.0	52.0	51.3
NCEH 3R BT	54.0	47.0	51.7	50.9
Tulasi 4 Bt	55.0	46.0	51.0	50.7
Tulasi 117 Bt	55.0	47.0	51.7	51.2
NPH 2270 Bt	52.0	46.0	53.0	50.3



NPH 2171 Bt	52.0	44.0	51.0	49.0
Brahma Bt	54.0	47.0	52.0	51.0
Dhanwan Bt	55.0	46.0	53.0	51.3
GK 207 Bt	56.0	47.0	52.0	51.7
GK 209 Bt	54.0	47.0	52.0	51.0
ACH 33-1Bt	54.0	46.0	51.0	50.3
ACH 11-1Bt	60.0	45.0	52.3	52.4
ACH 21-1Bt	55.0	45.0	51.0	50.3
KDCHH 9632 Bt	56.0	44.0	51.0	50.3
KDCHH 441 BG II	58.0	45.0	51.7	51.6
PRCH 102 Bt	57.0	44.0	52.0	51.0
PRCH 103 Bt	53.0	45.0	51.0	49.7
Bunny (Check)	52.0	46.0	51.7	49.9
RCH 2Bt (Check)	54.0	46.0	51.0	50.3
RCH 368Bt (Check)	53.0	47.0	53.0	51.0

**Table 3. 50% flowering (days)**

<b>Entry</b>	<b>CBE</b>	<b>Guntur</b>	<b>Nandyal</b>	<b>Mean</b>
RCH 111 Bt	66.0	51.0	64.0	60.3
RCH 371 Bt	66.0	51.0	65.0	60.7
MRC6100 Bt	61.0	50.0	63.0	58.0
MRC 7228BGII	59.0	51.0	59.0	56.3
MRC 7351 BGII	59.0	52.0	61.0	57.3
NCS 913 Bt	62.0	50.0	62.7	58.2
JKCH 99 Bt	61.0	51.0	64.0	58.7
JKCH 10 Bt	63.0	50.0	62.0	58.3
JKCH 634 Bt	59.0	52.0	60.0	57.0
NCEH 2R Bt	59.0	51.0	63.3	57.8
NCEH 3R BT	58.0	52.0	65.0	58.3
Tulasi 4 Bt	60.0	50.0	64.0	58.0
Tulasi 117 Bt	59.0	51.0	61.0	57.0
NPH 2270 Bt	56.0	49.0	64.0	56.3
NPH 2171 Bt	56.0	48.0	60.0	54.7
Brahma Bt	58.0	51.0	62.7	57.2
Dhanwan Bt	59.0	51.0	63.0	57.7
GK 207 Bt	61.0	52.0	59.7	57.6
GK 209 Bt	58.0	51.0	63.3	57.4
ACH 33-1Bt	58.0	51.0	61.7	56.9
ACH 11-1Bt	65.0	50.0	62.7	59.2
ACH 21-1Bt	60.0	50.0	61.0	57.0
KDCHH 9632 Bt	61.0	49.0	58.0	56.0
KDCHH 441 BG II	63.0	50.0	62.7	58.6
PRCH 102 Bt	62.0	49.0	64.3	58.4

PRCH 103 Bt	57.0	49.0	63.0	56.3
Bunny (Check)	56.0	51.0	61.0	56.0
RCH 2Bt (Check)	58.0	50.0	64.0	57.3
RCH 368Bt (Check)	57.0	52.0	61.7	56.9

### Bolls per plant

Bolls per plant were less at Coimbatore and Dharwad. Mean number of bolls per plant showed considerable variation across locations (Table 4).

**Table 4. Bolls/plant**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	29.3	36.3	43.4	49.9	19.3	35.6
RCH 371 Bt	35.1	42.3	43.3	56.3	21.9	39.8
MRC6100 Bt	32.3	49.7	45.2	60.3	21.3	41.8
MRC 7228BGII	26.8	42.1	47.2	43.2	21.8	36.2
MRC 7351 BGII	28.9	47.1	43.2	64.0	19.5	40.5
NCS 913 Bt	31.1	39.3	48.6	62.7	19.9	40.3
JKCH 99 Bt	29.1	35.5	47.6	50.9	21.9	37.0
JKCH 10 Bt	28.1	38.3	35.3	43.9	17.9	32.7
JKCH 634 Bt	31.0	36.4	40.5	32.9	15.5	31.3
NCEH 2R Bt	28.1	35.8	35.8	33.8	17.4	30.2
NCEH 3R BT	32.1	38.7	40.6	53.9	20.2	37.1
Tulasi 4 Bt	30.2	46.9	48.0	43.3	21.7	38.0
Tulasi 117 Bt	30.2	48.3	35.4	65.7	20.2	40.0
NPH 2270 Bt	29.4	38.2	35.3	64.5	17.3	37.0
NPH 2171 Bt	29.2	37.8	36.3	41.4	17.0	32.3
Brahma Bt	32.0	49.5	41.5	64.9	21.8	41.9
Dhanwan Bt	31.3	48.0	39.0	53.9	22.9	39.0
GK 207 Bt	32.1	43.2	41.9	52.5	15.3	37.0
GK 209 Bt	35.0	48.3	46.0	53.5	21.1	40.8
ACH 33-1Bt	30.5	41.6	43.0	51.9	19.9	37.4
ACH 11-1Bt	24.0	45.6	38.2	42.9	16.1	33.4
ACH 21-1Bt	26.9	40.5	34.5	36.3	17.1	31.0
KDCHH 9632 Bt	30.0	44.1	43.3	45.6	14.5	35.5
KDCHH 441 BG II	29.0	47.7	42.5	43.5	18.1	36.2
PRCH 102 Bt	30.0	39.3	41.0	49.1	13.3	34.5
PRCH 103 Bt	28.5	46.6	26.6	61.0	16.8	35.9
Bunny (Check)	29.9	39.3	41.6	31.4	13.1	31.1
RCH 2Bt (Check)	29.3	36.0	43.9	63.7	16.3	37.8
RCH 368Bt (Check)	31.5	40.5	45.3	51.4	19.8	37.7
CD at 5%	4.6	8.8	10.9	6.90	3.0	-
CV %	9.5	12.8	16.5	8.33	9.7	-

### Boll Weight (g)

Boll weight was less at Nandyal and highest at Siruguppa. MRC 7351 BG II recorded the highest boll weight of 5.5 g, followed by MRC 7228 BG II with 5.4 g. NPH 2171 Bt recorded the lowest boll weight of 4.4 g (Table 5).

**Table 5. Boll weight (g)**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	4.9	5.4	4.5	3.4	4.9	4.6
RCH 371 Bt	4.9	5.2	4.9	3.4	4.4	4.5
MRC6100 Bt	5.1	5.2	5.7	3.4	5.8	5.0
MRC 7228BGII	5.9	6.1	5.7	3.2	5.9	5.4
MRC 7351 BGII	5.6	6.3	5.9	3.4	6.5	5.5
NCS 913 Bt	4.7	6.6	5.9	3.4	4.5	5.0
JKCH 99 Bt	5.0	4.6	4.6	3.4	5.0	4.5
JKCH 10 Bt	4.5	5.2	4.4	3.6	5.1	4.6
JKCH 634 Bt	4.6	5.1	4.7	3.4	4.9	4.5
NCEH 2R Bt	5.2	5.4	4.4	3.5	6.1	4.9
NCEH 3R BT	4.8	5.6	4.4	3.2	5.1	4.6
Tulasi 4 Bt	4.9	5.1	4.2	3.4	4.9	4.5
Tulasi 117 Bt	4.6	5.2	4.0	3.4	5.4	4.5
NPH 2270 Bt	4.9	5.1	4.6	3.4	4.7	4.5
NPH 2171 Bt	4.8	5.0	4.4	3.4	4.6	4.4
Brahma Bt	5.4	5.7	5.2	3.4	6.2	5.2
Dhanwan Bt	5.4	5.7	5.1	3.4	5.5	5.0
GK 207 Bt	4.7	5.4	5.3	3.6	5.3	4.9
GK 209 Bt	4.4	4.9	5.1	3.6	4.6	4.5
ACH 33-1Bt	4.6	5.0	4.6	3.4	4.7	4.5
ACH 11-1Bt	4.4	5.4	4.5	3.4	4.7	4.5
ACH 21-1Bt	5.2	5.7	4.6	3.5	5.6	4.9
KDCHH 9632 Bt	5.2	5.5	4.6	3.5	5.1	4.8
KDCHH 441 BG II	5.6	6.5	5.1	3.6	6.4	5.4
PRCH 102 Bt	5.0	5.5	5.0	3.5	5.5	4.9
PRCH 103 Bt	4.4	4.9	6.1	3.4	5.1	4.8
Bunny (Check)	5.0	5.3	4.9	3.4	5.4	4.8
RCH 2Bt (Check)	4.6	5.6	5.0	3.4	4.8	4.7
RCH 368Bt (Check)	5.1	5.3	4.8	3.4	5.3	4.8
CD at 5%	0.6	0.2	0.5	0.33	0.7	-
CV %	7.3	2.3	6.4	5.89	8.8	-

### Ginning Percentage

Mean ginning out turn of the Bt test entries ranged from 32.2 (MRC 7228 BG II) to 39.5 per cent (JKCH 634 Bt). The mean ginning out turn of the check hybrids ranged from 34.0 to 35.0 per cent (Table 6).

**Table 6. Ginning percentage**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	38.5	33.4	33.7	31.7	36.7	34.8
RCH 371 Bt	38.2	36.7	34.1	33.0	37.4	35.9
MRC6100 Bt	41.8	33.1	31.1	37.0	36.0	35.8
MRC 7228BGII	36.3	32.4	28.0	31.0	33.5	32.2
MRC 7351 BGII	38.8	33.5	31.9	31.0	36.6	34.4
NCS 913 Bt	42.4	37.1	34.4	33.0	38.6	37.1
JKCH 99 Bt	37.2	35.0	33.7	32.7	38.9	35.5
JKCH 10 Bt	40.7	36.8	35.3	32.0	39.1	36.8
JKCH 634 Bt	44.7	38.8	35.0	37.0	41.9	39.5
NCEH 2R Bt	41.9	35.3	34.3	33.0	39.6	36.8
NCEH 3R BT	38.0	34.9	33.7	33.0	38.5	35.6
Tulasi 4 Bt	40.4	33.8	33.3	32.0	37.1	35.3
Tulasi 117 Bt	37.3	33.8	33.0	33.0	35.8	34.6
NPH 2270 Bt	39.0	34.3	31.0	33.0	35.3	34.5
NPH 2171 Bt	38.6	35.6	34.1	32.3	37.9	35.7
Brahma Bt	38.2	32.0	31.2	32.0	35.9	33.9
Dhanwan Bt	39.2	32.8	30.2	31.0	37.0	34.0
GK 207 Bt	36.7	33.8	32.0	31.7	41.0	35.0
GK 209 Bt	38.1	35.8	32.4	35.0	36.7	35.6
ACH 33-1Bt	38.4	34.8	32.4	34.0	37.2	35.4
ACH 11-1Bt	37.3	34.1	31.7	31.7	36.3	34.2
ACH 21-1Bt	39.2	34.3	31.8	31.7	36.4	34.7
KDCHH 9632 Bt	41.1	36.5	31.6	33.0	38.7	36.2
KDCHH 441 BG II	42.3	34.1	35.4	31.3	36.2	35.9
PRCH 102 Bt	39.8	35.2	34.0	33.0	39.4	36.3
PRCH 103 Bt	36.7	33.3	32.2	31.0	34.5	33.5
Bunny (Check)	37.3	32.6	34.7	31.0	37.3	34.6
RCH 2Bt (Check)	38.3	32.6	31.5	31.7	36.1	34.0
RCH 368Bt (Check)	38.7	33.6	32.9	33.0	37.0	35.0
CD at 5%	2.8	1.6	3.8	1.65	3.6	-
CV %	4.4	2.9	7.3	3.09	6.0	-

**Lint Index**

Lint Index varied from 5.3 g to 6.5 g. Most of the test hybrids were on par with the check hybrids in lint index (Table 7).

**Table 7. Lint index (g)**

Entry	CBE	Siruguppa	Guntur	Dharwad	Mean
RCH 111 Bt	6.8	6.1	4.0	5.2	5.5
RCH 371 Bt	6.9	6.4	5.3	5.3	6.0
MRC6100 Bt	6.7	5.5	5.1	6.0	5.8

MRC 7228BGII	7.2	5.7	5.1	5.5	5.9
MRC 7351 BGII	7.7	6.3	5.4	5.4	6.2
NCS 913 Bt	6.8	6.0	6.0	6.6	6.4
JKCH 99 Bt	7.3	5.2	5.3	4.4	5.5
JKCH 10 Bt	6.3	5.6	5.6	6.5	6.0
JKCH 634 Bt	6.2	6.2	5.2	6.4	6.0
NCEH 2R Bt	6.8	6.9	5.2	6.0	6.2
NCEH 3R BT	6.4	6.1	4.9	6.1	5.9
Tulasi 4 Bt	7.4	6.1	4.6	5.9	6.0
Tulasi 117 Bt	6.5	6.6	5.2	6.0	6.1
NPH 2270 Bt	6.3	5.6	5.0	6.4	5.8
NPH 2171 Bt	6.7	5.8	5.0	6.4	6.0
Brahma Bt	6.5	5.6	5.1	5.8	5.7
Dhanwan Bt	6.9	6.0	4.6	5.4	5.7
GK 207 Bt	6.4	5.9	4.6	5.6	5.6
GK 209 Bt	5.8	6.0	4.5	5.9	5.6
ACH 33-1Bt	5.8	5.3	5.0	6.7	5.7
ACH 11-1Bt	5.7	5.3	4.6	5.7	5.3
ACH 21-1Bt	7.5	6.8	5.9	5.4	6.4
KDCHH 9632 Bt	7.4	6.7	5.0	6.1	6.3
KDCHH 441 BG II	7.9	6.7	6.1	5.3	6.5
PRCH 102 Bt	7.8	6.4	4.6	4.9	5.9
PRCH 103 Bt	5.9	5.1	3.8	6.3	5.3
Bunny (Check)	6.9	5.3	5.9	5.5	5.9
RCH 2Bt (Check)	6.6	6.1	5.7	6.0	6.1
RCH 368Bt (Check)	7.3	6.4	4.8	5.7	6.0
CD at 5%	1.0	0.6	1.1	0.5	-
CV %	8.6	6.2	13.6	5.5	-

### Seed Index

As many as 20 test hybrids recorded a seed index of 10 g and above. The check hybrids also recorded above 11.0 g seed index. JKCH 634 BT recorded the lowest seed index of 8.8 g (Table 8).

**Table 8. Seed index (g)**

Entry	CBE	Siruguppa	Guntur	Dharwad	Mean
RCH 111 Bt	10.9	12.2	10.1	12.0	11.3
RCH 371 Bt	11.2	11.0	9.5	11.7	10.8
MRC6100 Bt	9.3	11.1	10.9	10.7	10.5
MRC 7228BGII	12.6	11.9	13.0	12.0	12.4
MRC 7351 BGII	12.2	12.5	11.3	11.7	11.9
NCS 913 Bt	9.3	10.2	11.3	9.3	10.0

JKCH 99 Bt	12.2	11.5	10.3	13.7	11.9
JKCH 10 Bt	9.1	9.5	9.2	9.3	9.3
JKCH 634 Bt	7.7	9.8	8.8	9.0	8.8
NCEH 2R Bt	9.5	10.8	8.7	10.0	9.7
NCEH 3R BT	10.4	11.4	7.4	10.0	9.8
Tulasi 4 Bt	10.9	12.0	9.0	10.7	10.6
Tulasi 117 Bt	10.9	10.9	10.2	10.7	10.7
NPH 2270 Bt	9.9	10.6	10.7	10.0	10.3
NPH 2171 Bt	10.6	10.5	9.4	9.7	10.0
Brahma Bt	10.5	11.9	10.9	11.0	11.1
Dhanwan Bt	10.7	12.2	10.3	11.7	11.2
GK 207 Bt	11.0	11.5	9.6	11.7	10.9
GK 209 Bt	9.4	10.7	9.1	10.7	10.0
ACH 33-1Bt	9.2	9.8	10.3	9.3	9.7
ACH 11-1Bt	9.6	10.3	9.6	11.3	10.2
ACH 21-1Bt	11.7	13.1	12.4	11.7	12.2
KDCHH 9632 Bt	10.6	11.6	10.6	10.0	10.7
KDCHH 441 BG II	11.0	13.0	10.7	12.0	11.7
PRCH 102 Bt	11.8	11.7	8.6	12.3	11.1
PRCH 103 Bt	10.2	10.2	7.4	10.3	9.5
Bunny (Check)	11.6	10.9	10.8	11.3	11.1
RCH 2Bt (Check)	10.6	12.5	10.4	10.7	11.0
RCH 368Bt (Check)	11.5	12.6	9.6	11.0	11.2
CD at 5%	1.6	0.8	2.2	0.9	-
CV %	8.8	4.5	13.1	5.3	-

## B. MEAN SEED COTTON YIELD UNDER PROTECTED CONDITIONS

### (i). Irrigated

The non Bt check hybrid Bunny recorded the lowest yield of 1861 kg/ha and all the 26 hybrids tested were superior to Bunny ranging from 4 to 66 per cent.

Among the two Bt checks used, RCH 368 Bt was higher yielding with a mean seed cotton yield of 2494 kg/ha. Twelve hybrids recorded higher yield over RCH 368 Bt. They are MRC 6100 Bt (3048 kg/ha), Brahma Bt (2751 kg/ha) Dhanwan Bt (2747 kg/ha), RCH 371 Bt (2670 kg/ha), Tulasi 117 Bt (2662 kg/ha), GK 207 Bt (2650), Tulasi 4 Bt (2623 kg/ha), GK 209 Bt (2569 kg/ha), ACH 33-1 Bt (2559 kg/ha), PRCH 103 Bt ( 2558 kg/ha), MRC 7351 BG II (2525 kg/ha) and NCS 913 Bt (2521 kg/ha) (Table 9).

**(ii). Rainfed**

All the hybrids tested except JKCH 634 Bt were superior to the non Bt check hybrid Bunny by 6 to 66 per cent.

Among the two Bt checks used, RCH 2 Bt recorded superior yield (2050 kg/ha). Eleven test hybrids were superior to RCH-2 Bt. They are NCS 913 Bt (2338 kg/ha), RCH 371 Bt (2296 kg/ha), Brahma Bt (2250 kg/ha), MRC 6100 Bt (2228 kg/ha), NCEH 3R Bt (2183 kg/ha) MRC 7228 BG II (2166 kg/ha), Tulasi 4 Bt (2156 kg/ha), MRC 7351 BG II (2108 kg/ha), Dhanwan Bt (2074 kg/ha), RCH 111 Bt (2059 kg/ha) and Tulasi 117 Bt (2054 kg/ha) (Table 9).

**Table 9. Seed cotton yield (Kg/ha) under protected condition**

Entry	Irrigated			Rainfed			
	CBE	Siruguppa	Mean	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	1875	2577	2226	2888	1723	1566	2059
RCH 371 Bt	2443	2896	2670	2819	1878	2193	2296
MRC6100 Bt	2419	3677	3048	2575	2157	1951	2228
MRC 7228BGII	2082	2906	2494	2817	1570	2111	2166
MRC 7351 BGII	1952	3098	2525	2834	2005	1484	2108
NCS 913 Bt	1842	3200	2521	2905	2295	1816	2338
JKCH 99 Bt	1875	2419	2147	2663	1477	1755	1965
JKCH 10 Bt	2005	2733	2369	2093	1450	1552	1698
JKCH 634 Bt	1644	2757	2200	1564	1033	1185	1261
NCEH 2R Bt	1586	2742	2164	1602	1219	1636	1486
NCEH 3R BT	1863	2720	2292	2890	1809	1849	2183
Tulasi 4 Bt	2082	3164	2623	2703	1885	1880	2156
Tulasi 117 Bt	1988	3336	2662	2440	2007	1715	2054
NPH 2270 Bt	1609	3171	2390	1811	2318	1205	1778
NPH 2171 Bt	1431	2840	2136	2026	1328	1173	1509
Brahma Bt	2552	2949	2751	2733	2224	1792	2250
Dhanwan Bt	1982	3513	2747	2604	1876	1741	2074
GK 207 Bt	2118	3182	2650	2528	1712	1587	1942
GK 209 Bt	1976	3163	2569	2081	1880	1617	1859
ACH 33-1Bt	2159	2959	2559	2456	1601	1737	1931
ACH 11-1Bt	1437	2947	2192	2471	1394	1599	1821
ACH 21-1Bt	1804	3044	2424	2241	1265	1680	1729
KDCHH 9632 Bt	1811	3018	2415	2333	1717	1289	1780
KDCHH 441 BG II	1615	2375	1995	1678	1348	1595	1540
PRCH 102 Bt	1899	2747	2323	2738	1830	1230	1933
PRCH 103 Bt	1840	3277	2558	2334	2015	1721	2023
Bunny (Check)	1781	1941	1861	2429	780	1009	1406
RCH 2Bt (Check)	1988	2473	2230	2653	2068	1430	2050
RCH 368Bt (Check)	2124	2865	2494	2681	1743	1392	1939
CD at 5%	430	625	-	417	932	306	-
CV %	14	13	-	11	19.7	11.7	-

### C. FIBRE QUALITY EVALUATION

The fibre quality evaluations were made location wise.

2.5% span length varied from 25.8 mm to 31.7 mm (Table 10).

**Table 10. 2.5% Span length (mm)**

Entry	CBE	Guntur	Dharwad	Mean
RCH 111 Bt	30.7	29.1	30.0	29.9
RCH 371 Bt	29.7	29.5	28.1	29.1
MRC6100 Bt	28.4	28.3	28.6	28.4
MRC 7228BGII	28.8	26.9	28.5	28.1
MRC 7351 BGII	31.7	29.0	30.3	30.3
NCS 913 Bt	29.3	28.9	30.4	29.5
JKCH 99 Bt	28.9	27.3	27.6	27.9
JKCH 10 Bt	30.1	29.1	28.8	29.3
JKCH 634 Bt	25.4	26.3	25.6	25.8
NCEH 2R Bt	31.1	30.8	29.6	30.5
NCEH 3R BT	31.0	30.6	30.1	30.6
Tulasi 4 Bt	31.1	27.1	29.5	29.2
Tulasi 117 Bt	31.5	26.6	30.6	29.6
NPH 2270 Bt	29.8	28.3	27.4	28.5
NPH 2171 Bt	29.0	30.9	27.2	29.0
Brahma Bt	33.3	32.5	32.0	32.6
Dhanwan Bt	31.8	30.7	29.9	30.8
GK 207 Bt	31.4	32.7	30.9	31.7
GK 209 Bt	30.4	30.7	29.2	30.1
ACH 33-1Bt	29.8	30.3	27.2	29.1
ACH 11-1Bt	27.5	25.3	25.8	26.2
ACH 21-1Bt	30.3	29.1	30.4	29.9
KDCHH 9632 Bt	29.2	27.6	28.1	28.3
KDCHH 441 BG II	26.9	27.9	27.2	27.3
PRCH 102 Bt	28.8	29.0	28.6	28.8
PRCH 103 Bt	28.8	26.9	28.4	28.0
Bunny (Check)	33.4	23.9	30.9	29.4
RCH 2Bt (Check)	30.5	31.0	28.3	29.9
RCH 368Bt (Check)	33.0	30.9	31.2	31.7

Fibre uniformity ranged from 45.7 to 51.6 per cent. PRCH 103 Bt recorded the lowest micronaire (3.7). In general, micronaire values were low and only 9 hybrids recorded micronaire value of 4.5 and above. (Table 11 and 12)



**Table 11. Uniformity ratio (%)**

<b>Entry</b>	<b>CBE</b>	<b>Guntur</b>	<b>Dharwad</b>	<b>Mean</b>
RCH 111 Bt	48.0	47.5	48.0	47.8
RCH 371 Bt	49.0	49.9	48.0	49.0
MRC6100 Bt	47.0	50.0	46.0	47.7
MRC 7228BGII	50.0	52.1	48.0	50.0
MRC 7351 BGII	48.0	51.2	47.0	48.7
NCS 913 Bt	49.0	43.3	47.0	46.4
JKCH 99 Bt	50.0	48.3	49.0	49.1
JKCH 10 Bt	48.0	47.5	49.0	48.2
JKCH 634 Bt	50.0	55.7	49.0	51.6
NCEH 2R Bt	49.0	53.3	47.0	49.8
NCEH 3R BT	48.0	49.3	45.0	47.4
Tulasi 4 Bt	46.0	44.1	47.0	45.7
Tulasi 117 Bt	48.0	45.2	46.0	46.4
NPH 2270 Bt	50.0	51.7	50.0	50.6
NPH 2171 Bt	50.0	49.3	50.0	49.8
Brahma Bt	50.0	44.2	47.0	47.1
Dhanwan Bt	50.0	50.5	48.0	49.5
GK 207 Bt	49.0	50.6	48.0	49.2
GK 209 Bt	47.0	48.7	48.0	47.9
ACH 33-1Bt	49.0	51.3	49.0	49.8
ACH 11-1Bt	49.0	54.3	49.0	50.8
ACH 21-1Bt	49.0	47.2	46.0	47.4
KDCHH 9632 Bt	49.0	54.5	46.0	49.8
KDCHH 441 BG II	50.0	52.9	47.0	50.0
PRCH 102 Bt	49.0	55.4	48.0	50.8
PRCH 103 Bt	50.0	48.5	47.0	48.5
Bunny (Check)	47.0	47.1	46.0	46.7
RCH 2Bt (Check)	48.0	49.1	47.0	48.0
RCH 368Bt (Check)	47.0	50.5	46.0	47.8

**Table 12. Micronaire**

<b>Entry</b>	<b>CBE</b>	<b>Guntur</b>	<b>Dharwad</b>	<b>Mean</b>
RCH 111 Bt	4.7	3.8	4.1	4.2
RCH 371 Bt	4.6	5.1	4.2	4.6
MRC6100 Bt	4.7	5.7	3.8	4.7
MRC 7228BGII	5.0	5.6	4.5	5.0
MRC 7351 BGII	4.8	5.1	4.6	4.8
NCS 913 Bt	4.8	4.5	3.9	4.4
JKCH 99 Bt	5.1	5.5	4.9	5.2
JKCH 10 Bt	4.4	4.1	4.4	4.3
JKCH 634 Bt	4.4	5.2	4.5	4.7

NCEH 2R Bt	4.7	3.7	4.0	4.1
NCEH 3R BT	4.5	4.5	3.9	4.3
Tulasi 4 Bt	4.5	3.9	4.0	4.1
Tulasi 117 Bt	4.3	4.0	3.7	4.0
NPH 2270 Bt	4.3	4.7	3.9	4.3
NPH 2171 Bt	4.4	4.2	4.2	4.3
Brahma Bt	4.1	3.8	3.8	3.9
Dhanwan Bt	4.6	3.6	4.2	4.1
GK 207 Bt	4.2	3.6	4.0	3.9
GK 209 Bt	4.1	4.1	3.7	4.0
ACH 33-1Bt	4.6	4.7	4.0	4.4
ACH 11-1Bt	4.8	4.6	4.2	4.5
ACH 21-1Bt	4.3	4.2	3.9	4.1
KDCHH 9632 Bt	4.6	4.1	4.1	4.3
KDCHH 441 BG II	4.8	4.5	4.6	4.6
PRCH 102 Bt	5.3	6.1	4.9	5.4
PRCH 103 Bt	4.0	3.6	3.5	3.7
Bunny (Check)	4.5	3.7	4.0	4.1
RCH 2Bt (Check)	4.6	5.2	4.3	4.7
RCH 368Bt (Check)	4.3	4.0	4.0	4.1

Fibre strength values ranged from 20.2 to 24.2g/tex (Table 13).

**Table 13. Fibre strength (g/tex)**

Entry	CBE	Guntur	Dharwad	Mean
RCH 111 Bt	21.1	24.3	23.5	23.0
RCH 371 Bt	20.5	22.2	20.7	21.1
MRC6100 Bt	19.2	20.5	20.8	20.2
MRC 7228BGII	22.9	21.5	22.8	22.4
MRC 7351 BGII	20.8	23.0	20.8	21.5
NCS 913 Bt	20.8	22.9	23.0	22.2
JKCH 99 Bt	21.7	21.7	21.8	21.7
JKCH 10 Bt	21.6	24.1	22.4	22.7
JKCH 634 Bt	20.2	23.5	21.0	21.6
NCEH 2R Bt	22.0	23.8	23.2	23.0
NCEH 3R BT	21.7	22.2	21.5	21.8
Tulasi 4 Bt	23.1	22.7	23.3	23.0
Tulasi 117 Bt	21.6	22.8	21.9	22.1
NPH 2270 Bt	22.1	22.8	23.0	22.6
NPH 2171 Bt	22.2	22.9	23.2	22.8
Brahma Bt	23.8	22.2	24.3	23.4
Dhanwan Bt	21.5	25.1	23.0	23.2
GK 207 Bt	20.9	25.6	23.9	23.5
GK 209 Bt	24.8	24.0	23.9	24.2

ACH 33-1Bt	23.2	22.3	22.0	22.5
ACH 11-1Bt	20.6	23.9	21.4	22.0
ACH 21-1Bt	22.4	24.6	21.4	22.8
KDCHH 9632 Bt	19.7	22.1	20.6	20.8
KDCHH 441 BG II	19.3	24.8	20.3	21.5
PRCH 102 Bt	23.4	22.7	22.2	22.8
PRCH 103 Bt	21.7	24.3	24.2	23.4
Bunny (Check)	21.7	24.4	23.2	23.1
RCH 2Bt (Check)	22.0	23.2	22.0	22.4
RCH 368Bt (Check)	22.3	23.5	23.3	23.0

Elongation percentage varied from 6.1 to 7.2 per cent (Table 14).

**Table 14. Elongation (%)**

Entry	CBE	Guntur	Dharwad	Mean
RCH 111 Bt	6.4	6.5	5.8	6.2
RCH 371 Bt	7.1	6.9	6.2	6.7
MRC6100 Bt	6.4	6.5	6.7	6.5
MRC 7228BGII	6.5	6.6	6.3	6.5
MRC 7351 BGII	6.0	6.8	6.6	6.5
NCS 913 Bt	6.5	6.7	5.9	6.4
JKCH 99 Bt	7.3	6.6	5.8	6.6
JKCH 10 Bt	6.5	6.7	6.2	6.5
JKCH 634 Bt	8.6	6.8	6.3	7.2
NCEH 2R Bt	6.1	6.5	6.6	6.4
NCEH 3R BT	6.0	6.4	6.5	6.3
Tulasi 4 Bt	5.6	6.5	6.3	6.1
Tulasi 117 Bt	6.2	6.5	6.5	6.4
NPH 2270 Bt	6.8	6.6	6.1	6.5
NPH 2171 Bt	7.2	6.7	5.4	6.4
Brahma Bt	6.2	6.4	6.2	6.3
Dhanwan Bt	7.2	6.9	5.8	6.6
GK 207 Bt	8.2	6.7	5.3	6.7
GK 209 Bt	6.8	6.6	6.0	6.5
ACH 33-1Bt	6.5	6.6	6.0	6.4
ACH 11-1Bt	7.3	6.6	6.3	6.7
ACH 21-1Bt	6.6	6.7	6.1	6.5
KDCHH 9632 Bt	7.2	6.4	6.1	6.6
KDCHH 441 BG II	7.8	6.4	6.8	7.0
PRCH 102 Bt	5.8	6.5	6.6	6.3
PRCH 103 Bt	7.4	6.3	5.9	6.5
Bunny (Check)	6.3	6.7	6.7	6.6
RCH 2Bt (Check)	6.2	6.3	6.1	6.2
RCH 368Bt (Check)	6.2	6.6	6.3	6.4

Over all, fibre quality in the test hybrids was satisfactory (Table 15).

**Table 15. Overall fibre properties**

<b>Entry</b>	<b>2.5 % Span Length (mm)</b>	<b>UR (%)</b>	<b>Micronaire</b>	<b>Strength (g/tex)</b>	<b>Elongation (%)</b>
RCH 111 Bt	29.9	47.8	4.2	23.0	6.2
RCH 371 Bt	29.1	49.0	4.6	21.1	6.7
MRC6100 Bt	28.4	47.7	4.7	20.2	6.5
MRC 7228BGII	28.1	50.0	5.0	22.4	6.5
MRC 7351 BGII	30.3	48.7	4.8	21.5	6.5
NCS 913 Bt	29.5	46.4	4.4	22.2	6.4
JKCH 99 Bt	27.9	49.1	5.2	21.7	6.6
JKCH 10 Bt	29.3	48.2	4.3	22.7	6.5
JKCH 634 Bt	25.8	51.6	4.7	21.6	7.2
NCEH 2R Bt	30.5	49.8	4.1	23.0	6.4
NCEH 3R BT	30.6	47.4	4.3	21.8	6.3
Tulasi 4 Bt	29.2	45.7	4.1	23.0	6.1
Tulasi 117 Bt	29.6	46.4	4.0	22.1	6.4
NPH 2270 Bt	28.5	50.6	4.3	22.6	6.5
NPH 2171 Bt	29.0	49.8	4.3	22.8	6.4
Brahma Bt	32.6	47.1	3.9	23.4	6.3
Dhanwan Bt	30.8	49.5	4.1	23.2	6.6
GK 207 Bt	31.7	49.2	3.9	23.5	6.7
GK 209 Bt	30.1	47.9	4.0	24.2	6.5
ACH 33-1Bt	29.1	49.8	4.4	22.5	6.4
ACH 11-1Bt	26.2	50.8	4.5	22.0	6.7
ACH 21-1Bt	29.9	47.4	4.1	22.8	6.5
KDCHH 9632 Bt	28.3	49.8	4.3	20.8	6.6
KDCHH 441 BG II	27.3	50.0	4.6	21.5	7.0
PRCH 102 Bt	28.8	50.8	5.4	22.8	6.3
PRCH 103 Bt	28.0	48.5	3.7	23.4	6.5
Bunny (Check)	29.4	46.7	4.1	23.1	6.6
RCH 2Bt (Check)	29.9	48.0	4.7	22.4	6.2
RCH 368Bt (Check)	31.7	47.8	4.1	23.0	6.4

## D. ENTOMOLOGICAL EVALUATIONS

The entomological evaluations were primarily targeted against the bollworms and sap sucking insects.

### 1. EVALUATION UNDER PROTECTED CONDITIONS

#### Sucking pests

##### (i). Jassid

Jassid was noticed at all locations with moderate intensity. Mean population was the lowest at Guntur (Table 16).

**Table 16. Jassids population/ Plant**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	3.2	3.4	2.1	2.9	2.5	2.83
RCH 371 Bt	2.6	3.2	1.5	2.3	3.1	2.54
MRC6100 Bt	3.0	3.3	1.1	3.0	3.2	2.71
MRC 7228BGII	2.9	3.8	1.3	2.4	2.4	2.54
MRC 7351 BGII	3.6	3.5	1.8	2.9	2.2	2.80
NCS 913 Bt	3.2	4.2	1.7	3.3	2.2	2.93
JKCH 99 Bt	3.7	3.0	2.2	3.4	3.4	3.16
JKCH 10 Bt	2.9	3.5	1.8	1.6	2.3	2.42
JKCH 634 Bt	3.2	3.6	1.8	2.3	3.3	2.86
NCEH 2R Bt	2.2	2.5	1.4	2.4	1.5	1.99
NCEH 3R BT	3.3	2.3	1.2	2.1	2.9	2.36
Tulasi 4 Bt	3.6	3.4	1.5	2.7	3.1	2.84
Tulasi 117 Bt	4.0	2.4	1.8	2.7	2.9	2.75
NPH 2270 Bt	3.7	4.3	2.5	3.3	3.6	3.49
NPH 2171 Bt	3.1	4.3	1.6	3.0	3.6	3.13
Brahma Bt	4.6	3.3	1.7	2.6	3.5	3.11
Dhanwan Bt	3.6	2.9	1.4	2.3	3.9	2.82
GK 207 Bt	3.0	2.3	1.3	3.7	2.5	2.56
GK 209 Bt	3.1	3.0	1.9	2.3	4.6	3.01
ACH 33-1Bt	3.6	3.6	1.4	2.5	3.2	2.85
ACH 11-1Bt	4.0	2.9	1.3	2.6	2.6	2.69
ACH 21-1Bt	3.7	2.6	1.0	2.6	2.3	2.45
KDCHH 9632 Bt	4.0	4.0	1.7	1.7	3.6	3.01
KDCHH 441 BG II	3.9	3.9	1.8	3.4	3.2	3.24
PRCH 102 Bt	3.2	3.6	1.4	6.3	3.5	3.60
PRCH 103 Bt	7.0	2.3	1.5	2.2	2.8	3.16
Bunny (Check)	3.5	2.8	1.5	1.8	3.7	2.67
RCH 2Bt (Check)	3.5	3.1	3.0	4.1	3.4	3.39
RCH 368Bt (Check)	3.7	2.5	1.3	2.1	3.7	2.66

**(ii). Thrips**

Thrips damage was maximum at certain periods in Siruguppa and Dharwad. It was low at Guntur and Nandyal. At Coimbatore, Thrips were absent (Table 17).

**Table 17. Thrips population/ Plant**

Entry	Siruguppa	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	19.0	7.5	9.9	28.4	16.2
RCH 371 Bt	43.3	11.6	12.7	29.4	24.2
MRC6100 Bt	39.2	11.7	12.9	27.3	22.8
MRC 7228BGII	37.0	10.7	16.5	37.2	25.3
MRC 7351 BGII	32.5	13.1	12.9	27.6	21.5
NCS 913 Bt	17.7	7.8	7.3	32.6	16.3
JKCH 99 Bt	11.7	7.2	6.5	27.7	13.3
JKCH 10 Bt	29.1	9.5	11.6	27.8	19.5
JKCH 634 Bt	29.1	12.4	13.5	27.8	20.7
NCEH 2R Bt	28.7	8.3	11.2	31.3	19.9
NCEH 3R BT	18.1	7.6	9.3	28.5	15.9
Tulasi 4 Bt	19.1	8.8	7.7	29.6	16.3
Tulasi 117 Bt	14.7	7.3	4.9	28.9	14.0
NPH 2270 Bt	23.3	9.3	5.8	30.0	17.1
NPH 2171 Bt	29.2	9.4	11.1	30.6	20.1
Brahma Bt	19.5	8.4	6.7	31.6	16.5
Dhanwan Bt	36.2	8.9	11.1	34.8	22.7
GK 207 Bt	29.5	11.3	12.5	38.6	23.0
GK 209 Bt	30.0	10.6	10.4	35.5	21.6
ACH 33-1Bt	33.7	12.0	10.9	33.1	22.4
ACH 11-1Bt	27.9	12.4	13.7	29.1	20.8
ACH 21-1Bt	23.5	9.7	14.0	31.2	19.6
KDCHH 9632 Bt	26.8	7.8	13.0	35.9	20.9
KDCHH 441 BG II	28.7	9.0	11.5	35.0	21.1
PRCH 102 Bt	27.1	10.5	9.7	32.6	20.0
PRCH 103 Bt	36.3	10.8	14.9	31.8	23.5
Bunny (Check)	17.3	7.8	6.7	30.2	15.5
RCH 2Bt (Check)	14.6	6.4	7.2	27.2	13.9
RCH 368Bt (Check)	18.5	8.8	13.0	35.0	18.8

**(iii). Aphids:**

Aphid incidence was high at Coimbatore and moderate at Dharwad. It was low at Guntur. It was not observed at Siruguppa and Nandyal (Table 18).

**Table 18. Aphids population/ Plant**

Entry	CBE	Guntur	Dharwad	Mean
RCH 111 Bt	22.0	2.3	9.6	11.3
RCH 371 Bt	36.5	2.5	7.5	15.5
MRC6100 Bt	19.2	2.2	10.8	10.7

MRC 7228BGII	34.5	1.6	13.3	16.5
MRC 7351 BGII	34.9	1.9	12.4	16.4
NCS 913 Bt	26.7	1.1	11.5	13.1
JKCH 99 Bt	27.5	1.1	11.4	13.3
JKCH 10 Bt	26.2	1.3	12.5	13.3
JKCH 634 Bt	25.9	1.1	12.9	13.3
NCEH 2R Bt	19.0	2.3	8.3	9.8
NCEH 3R BT	28.5	2.0	9.2	13.2
Tulasi 4 Bt	20.9	3.0	9.5	11.1
Tulasi 117 Bt	28.8	2.4	7.9	13.0
NPH 2270 Bt	17.4	2.4	7.1	9.0
NPH 2171 Bt	22.0	2.3	11.0	11.8
Brahma Bt	22.4	1.9	11.3	11.9
Dhanwan Bt	17.2	3.0	12.6	10.9
GK 207 Bt	17.3	2.3	9.8	9.8
GK 209 Bt	22.6	2.2	12.0	12.3
ACH 33-1Bt	35.8	2.3	14.9	17.7
ACH 11-1Bt	21.9	2.7	12.7	12.4
ACH 21-1Bt	24.2	2.5	18.8	15.2
KDCHH 9632 Bt	21.0	1.5	15.1	12.5
KDCHH 441 BG II	34.9	1.0	17.3	17.7
PRCH 102 Bt	25.0	1.7	11.7	12.8
PRCH 103 Bt	31.0	2.1	20.4	17.8
Bunny (Check)	28.3	1.3	8.2	12.6
RCH 2Bt (Check)	27.0	1.6	9.8	12.8
RCH 368Bt (Check)	28.9	3.1	11.0	14.3

**(iv). Whitefly**

Whitefly population was low at all the centres (Table 19).

**Table 19. Whitefly population/ Plant**

Entry	Siruguppa	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	0.5	1.3	0.6	3.6	1.5
RCH 371 Bt	0.6	2.1	1.0	2.4	1.5
MRC6100 Bt	1.2	4.8	1.9	4.8	3.2
MRC 7228BGII	1.2	3.9	1.6	3.0	2.4
MRC 7351 BGII	1.5	3.5	1.7	3.9	2.7
NCS 913 Bt	1.3	3.0	0.7	1.8	1.7
JKCH 99 Bt	0.6	2.0	1.5	3.6	1.9
JKCH 10 Bt	0.6	1.9	0.7	3.6	1.7
JKCH 634 Bt	0.3	2.3	0.9	3.6	1.8
NCEH 2R Bt	0.6	2.7	0.7	3.0	1.7
NCEH 3R BT	0.7	1.7	0.9	4.2	1.9

Tulasi 4 Bt	1.3	3.3	1.7	3.6	2.4
Tulasi 117 Bt	1.2	1.6	1.6	3.9	2.1
NPH 2270 Bt	0.9	2.1	0.8	3.3	1.8
NPH 2171 Bt	1.0	3.1	0.9	3.6	2.2
Brahma Bt	1.4	2.2	0.6	3.3	1.9
Dhanwan Bt	0.6	2.4	1.1	3.3	1.9
GK 207 Bt	1.2	3.5	1.0	5.4	2.8
GK 209 Bt	1.3	2.4	1.0	5.1	2.4
ACH 33-1Bt	1.2	3.5	1.2	3.9	2.5
ACH 11-1Bt	0.4	3.2	0.8	3.9	2.1
ACH 21-1Bt	1.0	2.9	1.1	3.9	2.2
KDCHH 9632 Bt	0.3	2.6	0.8	3.6	1.8
KDCHH 441 BG II	0.5	4.0	1.5	5.1	2.8
PRCH 102 Bt	0.5	2.3	2.2	3.9	2.3
PRCH 103 Bt	1.3	5.0	1.1	4.8	3.0
Bunny (Check)	1.2	3.5	0.9	4.2	2.5
RCH 2Bt (Check)	0.5	1.8	0.6	3.3	1.6
RCH 368Bt (Check)	0.5	3.3	0.9	3.9	2.1

### Natural Enemies

The common natural enemies noticed were coccinellids grubs and adults, spiders and chrysopids. Natural enemy population was low and there was no significant difference between natural enemy population on non Bt check and other Bt hybrids.

**Table 20. Natural enemies**

Entry	Siruguppa	Nandyal	Dharwad	Mean
RCH 111 Bt	0.13	0.56	0.12	0.27
RCH 371 Bt	0.27	0.39	0.32	0.32
MRC6100 Bt	0.23	0.14	0.33	0.24
MRC 7228BGII	0.27	0.25	0.26	0.26
MRC 7351 BGII	0.27	0.34	0.24	0.28
NCS 913 Bt	0.07	0.42	0.32	0.27
JKCH 99 Bt	0.20	0.16	0.24	0.20
JKCH 10 Bt	0.27	0.32	0.15	0.25
JKCH 634 Bt	0.20	0.20	0.28	0.23
NCEH 2R Bt	0.17	0.32	0.22	0.23
NCEH 3R BT	0.03	0.17	0.23	0.14
Tulasi 4 Bt	0.03	0.32	0.27	0.21
Tulasi 117 Bt	0.13	0.13	0.27	0.17
NPH 2270 Bt	0.23	0.26	0.11	0.20
NPH 2171 Bt	0.00	0.23	0.23	0.16
Brahma Bt	0.04	0.24	0.48	0.25



Dhanwan Bt	0.03	0.27	0.22	0.17
GK 207 Bt	0.47	0.21	0.27	0.31
GK 209 Bt	0.34	0.68	0.40	0.47
ACH 33-1Bt	0.00	0.27	0.25	0.17
ACH 11-1Bt	0.33	0.25	0.28	0.29
ACH 21-1Bt	0.07	1.01	0.23	0.44
KDCHH 9632 Bt	0.23	0.45	0.36	0.34
KDCHH 441 BG II	0.33	0.27	0.37	0.32
PRCH 102 Bt	0.10	0.23	0.28	0.21
PRCH 103 Bt	0.20	0.26	0.28	0.24
Bunny (Check)	0.20	0.35	0.32	0.29
RCH 2Bt (Check)	0.23	0.22	0.47	0.31
RCH 368Bt (Check)	0.20	0.22	0.18	0.20

### Boll worms

#### Larval Population

Larval Population of *Earias* sp. was not reported from any centre. *Helicoverpa armigera* was very low at Coimbatore and appeared very late at Dharwad, but was observed on all hybrids in equal proportion (Table 21).

**Table 21. Larval population of *H. armigera* at Dharwad (Larvae/ 5 plants)**

Entry	Observations							
	90 DAS		110 DAS		120 DAS		150 DAS	
	O V	T V	O V	T V	O V	T V	O V	T V
RCH 111 Bt	0.00	1.00	1.50	1.58	5.50	2.55	2.33	1.82
RCH 371 Bt	0.00	1.00	1.00	1.41	6.00	2.65	3.66	2.16
MRC6100 Bt	0.00	1.00	2.00	1.73	5.50	2.55	4.25	2.29
MRC 7228BGII	0.00	1.00	2.00	1.73	7.00	2.83	4.27	2.30
MRC 7351 BGII	0.00	1.00	3.50	2.12	6.50	2.74	3.59	2.14
NCS 913 Bt	2.50	1.87	1.00	1.41	5.00	2.45	2.28	1.81
JKCH 99 Bt	2.50	1.87	2.50	1.87	6.50	2.74	3.00	2.00
JKCH 10 Bt	0.00	1.00	3.50	2.12	7.50	2.92	4.58	2.36
JKCH 634 Bt	0.00	1.00	3.00	2.00	8.00	3.00	5.55	2.56
NCEH 2R Bt	0.00	1.00	2.00	1.73	5.50	2.55	4.04	2.24
NCEH 3R BT	0.00	1.00	1.50	1.58	5.50	2.55	3.99	2.23
Tulasi 4 Bt	0.00	1.00	3.00	2.00	6.00	2.65	4.55	2.36
Tulasi 117 Bt	2.50	1.87	3.50	2.12	5.50	2.55	2.20	1.79
NPH 2270 Bt	0.00	1.00	3.50	2.12	7.50	2.92	4.68	2.38
NPH 2171 Bt	0.00	1.00	1.50	1.58	5.50	2.55	4.04	2.24
Brahma Bt	0.00	1.00	0.00	1.00	6.00	2.65	3.99	2.23
Dhanwan Bt	2.50	1.87	1.00	1.41	6.66	2.77	4.25	2.29
GK 207 Bt	0.00	1.00	1.00	1.41	7.00	2.83	3.25	2.06
GK 209 Bt	2.50	1.87	3.50	2.12	5.99	2.64	2.29	1.81
ACH 33-1Bt	5.00	2.45	2.50	1.87	8.50	3.08	3.07	2.02
ACH 11-1Bt	5.00	2.45	2.50	1.87	6.90	2.81	4.33	2.31

ACH 21-1Bt	5.00	2.45	4.50	2.35	7.50	2.92	4.55	2.36
KDCHH 9632 Bt	0.00	1.00	1.00	1.41	9.50	3.24	3.90	2.21
KDCHH 441 BG II	0.00	1.00	2.50	1.87	5.55	2.56	4.99	2.45
PRCH 102 Bt	2.50	1.87	2.50	1.87	8.25	3.04	3.50	2.12
PRCH 103 Bt	0.00	1.00	3.50	2.12	9.50	3.24	4.55	2.36
Bunny (Check)	5.00	2.45	2.00	1.73	8.00	3.00	5.00	2.45
RCH 2Bt (Check)	2.50	1.87	2.00	1.73	6.00	2.65	3.55	2.13
RCH 368Bt (Check)	0.00	1.00	1.50	1.58	5.50	2.55	4.25	2.29
<b>F test</b>	NS		NS		S		NS	
<b>C.D. at 5%</b>					2.51			
<b>C.V %</b>					13.16			

The larval population of Pink bollworm was either absent or very low in most of the centres. At Dharwad it varied from 0.33 to 2.75/20 GB. The maximum larval population was observed on the non Bt check Bunny at Guntur and Dharwad (Table 22).

**Table 22. *Pectinophora gossypiella* no. of larvae/20 green bolls**

Entry	CBE		Guntur		Dharwad	Mean
	O.V	T.V	O.V	T.V		
RCH 111 Bt	0.0	0.2	0.3	1.14	1.33	0.55
RCH 371 Bt	0.0	0.2	0.0	0.00	0.33	0.11
MRC6100 Bt	0.0	0.2	0.0	0.00	1.17	0.39
MRC 7228BGII	0.0	0.2	0.0	0.00	1.75	0.58
MRC 7351 BGII	0.0	0.2	0.0	0.00	1.50	0.50
NCS 913 Bt	0.3	0.5	0.0	0.00	0.67	0.33
JKCH 99 Bt	0.0	0.2	0.0	0.00	1.33	0.44
JKCH 10 Bt	0.0	0.2	0.0	0.00	1.33	0.44
JKCH 634 Bt	0.0	0.2	0.0	0.00	1.00	0.33
NCEH 2R Bt	0.3	0.5	0.0	0.00	1.25	0.53
NCEH 3R BT	0.7	0.8	0.0	0.00	0.67	0.44
Tulasi 4 Bt	0.0	0.2	0.0	0.00	1.50	0.50
Tulasi 117 Bt	0.0	0.2	0.0	0.00	1.75	0.58
NPH 2270 Bt	0.0	0.2	0.0	0.00	1.00	0.33
NPH 2171 Bt	0.0	0.2	1.0	1.38	0.50	0.50
Brahma Bt	0.3	0.5	0.0	0.00	0.83	0.39
Dhanwan Bt	0.0	0.2	0.0	0.00	0.17	0.06
GK 207 Bt	0.3	0.5	0.0	0.00	1.92	0.75
GK 209 Bt	0.0	0.2	0.0	0.00	1.67	0.56
ACH 33-1Bt	0.3	0.5	0.3	1.14	2.08	0.91
ACH 11-1Bt	0.3	0.5	0.7	1.28	2.03	1.01
ACH 21-1Bt	0.3	0.5	0.0	0.00	2.67	1.00
KDCHH 9632 Bt	0.0	0.2	0.0	0.00	1.17	0.39
KDCHH 441 BG II	0.3	0.5	0.0	0.00	2.33	0.89

PRCH 102 Bt	0.0	0.2	0.0	0.00	1.50	0.50
PRCH 103 Bt	0.0	0.2	0.0	0.00	0.58	0.19
Bunny (Check)	0.0	0.2	4.7	2.36	2.75	2.47
RCH 2Bt (Check)	0.3	0.5	0.0	0.00	1.42	0.58
RCH 368Bt (Check)	0.3	0.5	0.0	0.00	1.33	0.55
CD at 5%	-	4.3	0.21		-	
CV %	-	112.4	12.00		-	

### Square Damage

The Square damage at Coimbatore was low and was noticed only at 120 DAS. Square damage up to 15 per cent was noticed on 65 DAS at Siruguppa (Table 23).

**Table 23. Square damage (%)**

Entry	CBE		Siruguppa	Guntur	Nandyal	Dharwad	Mean
	O.V	T.V					
RCH 111 Bt	0.3	1.9	13.64	0.4	7.4	2.76	4.9
RCH 371 Bt	0.3	1.7	13.13	0.6	9.3	1.77	5.0
MRC6100 Bt	0.5	3.3	4.76	0.9	8.0	1.23	3.1
MRC 7228BGII	0.3	1.9	6.36	0.4	6.3	1.37	2.9
MRC 7351 BGII	0.3	1.9	3.57	0.2	5.4	1.35	2.2
NCS 913 Bt	0.0	0.0	7.59	0.4	7.2	1.63	3.4
JKCH 99 Bt	0.3	1.7	10.48	0.4	7.3	2.29	4.1
JKCH 10 Bt	0.2	1.4	10.82	0.5	6.4	1.43	3.9
JKCH 634 Bt	0.3	1.7	9.89	0.2	4.4	1.95	3.3
NCEH 2R Bt	0.7	3.7	16.10	0.1	6.4	1.11	4.9
NCEH 3R BT	0.2	1.5	14.98	0.3	9.1	2.24	5.4
Tulasi 4 Bt	0.1	1.2	14.51	0.2	6.5	1.56	4.6
Tulasi 117 Bt	0.0	0.0	14.84	0.3	4.9	1.02	4.2
NPH 2270 Bt	0.3	1.9	7.48	0.7	6.2	3.45	3.6
NPH 2171 Bt	0.3	1.8	8.18	0.5	7.0	2.51	3.7
Brahma Bt	0.5	2.3	12.39	0.1	6.8	1.99	4.3
Dhanwan Bt	0.4	2.1	9.22	0.5	4.9	2.1	3.4
GK 207 Bt	0.3	1.9	13.23	0.2	5.5	1.49	4.2
GK 209 Bt	0.5	2.3	9.24	0.5	9.6	1.41	4.3
ACH 33-1Bt	0.4	2.2	6.02	0.3	8.8	2.19	3.6
ACH 11-1Bt	0.0	0.0	7.00	0.4	9.0	3.14	3.9
ACH 21-1Bt	0.3	1.7	5.90	0.7	6.1	2.75	3.1
KDCHH 9632 Bt	0.0	0.0	5.39	0.5	6.7	1.67	2.8
KDCHH 441 BG II	0.7	3.9	3.35	0.2	5.7	2.92	2.6
PRCH 102 Bt	0.0	0.0	9.30	0.6	7.9	2.17	4.0
PRCH 103 Bt	0.3	1.7	10.49	0.2	7.4	1.23	3.9
Bunny (Check)	0.6	3.6	11.04	1.7	9.6	1.63	4.9

RCH 2Bt (Check)	0.3	2.4	10.95	0.9	6.8	1.37	4.0
RCH 368Bt (Check)	0.4	2.2	7.60	0.7	3.8	1.6	2.8
CD at 5%	4.8		2.97	-	-	-	
CV %	162.5		18.98	-	-	-	

At other centres considerable square damage was observed at certain brief periods only (Table 24, 25 and 26).

**Table 24. Square damage (%) at Nandyal**

Entry	Observation				
	70 DAS	80DAS	90DAS	100 DAS	110DAS
RCH 111 Bt	8.73(2.68)	2.06(1.57)	18.87(4.07)	13.63(3.62)	3.33(1.92)
RCH 371 Bt	8.28(2.84)	6.63(2.62)	22.40(4.70)	8.86(2.99)	9.95(3.21)
MRC6100 Bt	7.39(2.69)	1.78(1.48)	26.15(4.96)	13.34(3.62)	3.93(1.91)
MRC 7228BGII	9.02(3.07)	3.49(1.57)	16.90(3.96)	8.87(2.71)	6.01(2.50)
MRC 7351 BGII	8.14(2.93)	2.95(1.74)	13.69(3.65)	11.12(3.38)	1.94(1.45)
NCS 913 Bt	9.43(3.07)	3.99(2.11)	15.14(3.85)	15.07(3.90)	6.46(2.52)
JKCH 99 Bt	10.05(3.11)	9.79(3.15)	11.39(3.14)	10.68(2.93)	8.16(2.92)
JKCH 10 Bt	13.07(3.65)	3.67(2.03)	12.69(3.59)	11.97(3.41)	2.90(1.70)
JKCH 634 Bt	6.94(2.69)	3.88(1.91)	8.34(2.96)	7.94(2.58)	1.99(1.12)
NCEH 2R Bt	5.02(2.31)	2.34(1.79)	16.43(4.02)	6.91(2.00)	7.20(2.76)
NCEH 3R Bt	10.48(3.30)	1.59(1.31)	20.12(4.44)	18.04(4.02)	6.16(2.52)
Tulasi 4 Bt	7.94(2.58)	2.01(1.55)	15.71(3.95)	15.04(3.43)	5.07(2.24)
Tulasi 117 Bt	1.71(1.32)	3.69(1.90)	9.77(3.19)	9.69(2.70)	6.83(2.53)
NPH 2270 Bt	4.83(2.28)	6.74(2.53)	8.70(2.90)	13.61(3.28)	6.57(2.41)
NPH 2171 Bt	5.19(2.32)	3.53(1.71)	19.86(4.13)	8.73(2.68)	9.16(2.66)
Brahma Bt	7.71(2.85)	3.38(1.94)	16.71(4.00)	11.11(3.38)	6.44(2.55)
Dhanwan Bt	6.28(2.42)	3.81(2.00)	11.67(3.30)	7.56(2.50)	3.92(2.07)
GK 207 Bt	8.33(2.95)	5.96(2.40)	13.62(3.74)	9.60(2.79)	2.94(1.64)
GK 209 Bt	5.05(2.32)	10.18(3.22)	22.44(4.76)	16.95(3.93)	8.39(2.97)
ACH 33-1Bt	9.11(2.87)	16.99(3.75)	17.85(4.13)	11.44(3.35)	4.64(2.04)
ACH 11-1Bt	7.61(2.85)	6.86(2.60)	23.08(4.78)	12.41(3.14)	10.12(2.81)
ACH 21-1Bt	6.26(2.54)	2.47(1.65)	21.13(4.59)	7.90(2.56)	3.15(1.52)
KDCHH 9632 Bt	6.07(2.43)	3.86(2.08)	19.24.399	8.92(2.63)	7.16(2.49)
KDCHH 441 BG II	4.66(2.01)	1.58(1.23)	19.72(4.44)	7.25(2.45)	5.33(2.06)
PRCH 102 Bt	4.25(2.00)	5.31(2.28)	10.12(3.24)	17.82(3.59)	4.32(2.13)
PRCH 103 Bt	12.84(3.60)	2.42(1.59)	13.31(3.64)	15.15(3.95)	6.12(2.54)
Bunny (Check)	8.20(2.91)	12.46(3.20)	15.45(3.40)	14.85(3.36)	14.39(3.85)
RCH 2 Bt (Check)	10.66(3.31)	2.14(1.56)	14.58(3.75)	12.12(3.43)	6.63(2.53)
F test	S	S	S	S	S
SED	0.71	0.68	0.90	0.94	0.82
C.D. at 5%	1.42	1.36	1.82	1.89	1.64
C.V.	32.57	39.88	28.63	37.07	43.13

**Table 25. Square damage (%) at Guntur**

<b>Entry</b>	<b>59DAS</b>	<b>67DAS</b>	<b>104DAS</b>	<b>121DAS</b>
RCH 111 Bt	1.95(8.00)	0.00	0.52 (2.47)	0.00
RCH 371 Bt	3.04(9.91)	0.00	0.00	0.00
MRC6100 Bt	6.10(13.68)	0.00	0.00	0.00
MRC 7228BGII	1.34(5.39)	0.00	0.00	0.00
MRC 7351 BGII	1.60(7.00)	0.00	0.00	0.00
NCS 913 Bt	2.22(8.45)	0.00	0.00	0.30 (3.14)
JKCH 99 Bt	2.11(8.32)	0.00	0.00	0.00
JKCH 10 Bt	2.95(7.72)	0.00	0.00	0.00
JKCH 634 Bt	1.17(5.07)	0.00	0.00	0.00
NCEH 2R Bt	0.00(0.00)	0.00	0.00	0.00
NCEH 3R BT	1.03(4.89)	0.00	0.00	0.00
Tulasi 4 Bt	1.70(6.04)	0.00	0.00	0.00
Tulasi 117 Bt	2.16(6.70)	0.00	0.00	0.00
NPH 2270 Bt	3.88(8.91)	0.00	0.00	0.00
NPH 2171 Bt	2.34 (7.08)	0.00	0.00	0.62 (4.52)
Brahma Bt	0.37 (2.07)	0.00	0.00	0.00
Dhanwan Bt	3.20 (10.03)	0.00	0.00	0.00
GK 207 Bt	1.27 (4.97)	0.00	0.00	0.00
GK 209 Bt	3.36 (9.08)	0.00	0.00	0.00
ACH 33-1Bt	2.18 (6.86)	0.00	0.00	0.00
ACH 11-1Bt	1.95 (7.787)	0.00	0.00	0.00
ACH 21-1Bt	3.89 (11.61)	0.00	0.00	0.00
KDCHH 9632 Bt	2.79 (7.48)	0.00	0.00	0.00
KDCHH 441 BG II	0.63 (2.40)	0.00	0.00	0.00
PRCH 102 Bt	3.74 (11.01)	0.00	0.00	0.00
PRCH 103 Bt	0.56 (2.50)	0.00	0.00	0.00
Bunny (Check)	9.92 (18.07)	0.00	0.00	0.00
RCH 2Bt (Check)	4.85 (12.23)	0.00	0.00	0.00
RCH 368Bt (Check)	3.89 (10.96)	0.00	0.00	0.00
F Test	Sig.		NS	NS
CD (p=0.05)	7.55	-	-	-
CV(%)	61.6	-	932.7	932.7

**Table 26. Square damage (%) at Dharwad**

Entry	90 DAS		110 DAS		125 DAS	
	AV	TV	AV	TV	AV	TV
RCH 111 Bt	2.43	8.97	2.23	8.60	6.19	14.41
RCH 371 Bt	0.76	5.01	2.66	9.39	5.41	13.46
MRC6100 Bt	0.47	3.92	0.61	4.47	5.05	12.99
MRC 7228BGII	0.93	5.55	0.25	2.86	4.96	12.88
MRC 7351 BGII	0.00	0.00	1.18	6.25	5.56	13.64
NCS 913 Bt	0.56	4.31	2.89	9.79	4.15	11.76
JKCH 99 Bt	0.35	3.41	3.20	10.32	6.28	14.52
JKCH 10 Bt	0.47	3.93	1.43	6.88	5.26	13.27
JKCH 634 Bt	1.65	7.38	2.45	9.01	4.94	12.85
NCEH 2R Bt	0.00	0.00	3.18	10.28	2.38	8.88
NCEH 3R BT	0.49	4.01	1.69	7.46	3.32	10.51
Tulasi 4 Bt	0.73	4.90	1.02	5.81	5.48	13.54
Tulasi 117 Bt	0.00	0.00	0.25	2.88	2.85	9.72
NPH 2270 Bt	1.11	6.05	7.19	15.56	6.52	14.80
NPH 2171 Bt	0.50	4.04	3.41	10.64	8.06	16.51
Brahma Bt	0.44	3.82	3.33	10.53	4.48	12.22
Dhanwan Bt	0.00	0.00	3.59	10.93	5.28	13.29
GK 207 Bt	0.39	3.56	2.73	9.51	3.86	11.34
GK 209 Bt	0.35	3.42	1.42	6.85	4.82	12.69
ACH 33-1Bt	1.66	7.41	1.49	7.02	5.76	13.90
ACH 11-1Bt	1.89	7.90	2.50	9.10	4.53	12.29
ACH 21-1Bt	1.09	6.00	1.47	6.96	4.56	12.34
KDCHH 9632 Bt	0.76	5.01	1.83	7.79	5.74	13.87
KDCHH 441 BG II	0.39	3.60	4.09	11.68	6.29	14.53
PRCH 102 Bt	1.01	5.77	2.20	8.53	7.07	15.42
PRCH 103 Bt	0.00	0.00	1.07	5.95	5.07	13.02
Bunny (Check)	0.49	4.00	2.92	9.84	4.76	12.61
RCH 2Bt (Check)	0.46	3.90	2.13	8.40	4.26	11.92
RCH 368Bt (Check)	0.53	4.17	1.33	6.63	4.97	12.88
F Test	NS		NS		S	
CD 5%					2.6	
CV %					13.5	

### Green boll damage

Green boll damage at 120 to 135 DAS at Siruguppa ranged from 9.2 to 22.5 per cent. Mean green boll damage at Nandyal varied from 0 to 8.0 per cent (Table 27).

**Table 27. Green boll damage (%)**

Entry	Siruguppa	Nandyal	Mean
RCH 111 Bt	14.2	0.3	7.3
RCH 371 Bt	9.2	8.0	8.6
MRC6100 Bt	11.7	2.5	7.1
MRC 7228BGII	17.5	2.6	10.0
MRC 7351 BGII	10.8	2.4	6.6
NCS 913 Bt	10.0	3.4	6.7
JKCH 99 Bt	17.5	1.9	9.7
JKCH 10 Bt	19.2	1.3	10.2
JKCH 634 Bt	22.5	1.7	12.1
NCEH 2R Bt	17.5	2.2	9.8
NCEH 3R BT	16.7	2.4	9.5
Tulasi 4 Bt	15.8	3.8	9.8
Tulasi 117 Bt	17.5	2.3	9.9
NPH 2270 Bt	14.2	0.5	7.3
NPH 2171 Bt	15.8	3.0	9.4
Brahma Bt	15.8	1.4	8.6
Dhanwan Bt	14.2	2.1	8.1
GK 207 Bt	11.7	2.0	6.8
GK 209 Bt	18.3	2.1	10.2
ACH 33-1Bt	18.3	2.2	10.2
ACH 11-1Bt	17.5	3.8	10.6
ACH 21-1Bt	16.7	5.4	11.0
KDCHH 9632 Bt	18.3	6.6	12.5
KDCHH 441 BG II	16.7	5.8	11.2
PRCH 102 Bt	13.3	1.5	7.4
PRCH 103 Bt	14.2	0.9	7.5
Bunny (Check)	15.0	0.0	7.5
RCH 2Bt (Check)	18.3	0.9	9.6
RCH 368Bt (Check)	14.2	5.4	9.8

The boll damage due to Pink boll worm was assessed in green bolls through destructive sampling. The damage was very low at Coimbatore and Guntur on Bt hybrids. The non Bt check hybrid Bunny recorded 23.3% boll damage at Guntur. At Dharwad also a maximum damage of 24% was seen on Bunny. But the damage levels on some of the Bt hybrids was also equally high (Table 28).

**Table 28. *Pectinophora gossypiella* - Green boll damage (%)**

Entry	CBE		Guntur		Dharwad	Mean
	O.V	T.V	O.V	T.V		
RCH 111 Bt	1.7	4.3	1.7	4.31	9.17	4.2
RCH 371 Bt	0.0	0.0	0.0	0.00	3.33	1.1
MRC6100 Bt	0.0	0.0	0.0	0.00	9.58	3.2
MRC 7228BGII	0.0	0.0	0.0	0.00	10.38	3.5
MRC 7351 BGII	0.0	0.0	0.0	0.00	13.83	4.6
NCS 913 Bt	0.0	0.0	0.0	0.00	8.33	2.8
JKCH 99 Bt	0.0	0.0	0.0	0.00	12.25	4.1
JKCH 10 Bt	0.0	0.0	0.0	0.00	12.98	4.3
JKCH 634 Bt	1.7	4.3	0.0	0.00	7.17	2.9
NCEH 2R Bt	0.0	0.0	0.0	0.00	9.52	3.2
NCEH 3R BT	1.7	4.3	0.0	0.00	11.67	4.4
Tulasi 4 Bt	0.0	0.0	0.0	0.00	11.75	3.9
Tulasi 117 Bt	0.0	0.0	0.0	0.00	7.47	2.5
NPH 2270 Bt	1.7	4.3	0.0	0.00	11.05	4.2
NPH 2171 Bt	0.0	0.0	3.3	8.61	6.72	3.4
Brahma Bt	1.7	4.3	0.0	0.00	9.13	3.6
Dhanwan Bt	0.0	0.0	0.0	0.00	5.11	1.7
GK 207 Bt	0.0	0.0	0.0	0.00	15.3	5.1
GK 209 Bt	0.0	0.0	0.0	0.00	13.2	4.4
ACH 33-1Bt	0.0	0.0	3.3	8.61	19.95	7.8
ACH 11-1Bt	3.3	12.9	3.3	8.61	16.72	7.8
ACH 21-1Bt	1.7	4.3	3.3	6.15	24.25	9.7
KDCHH 9632 Bt	0.0	0.0	0.0	0.00	16.03	5.3
KDCHH 441 BG II	0.0	0.0	0.0	0.00	24.85	8.3
PRCH 102 Bt	0.0	0.0	0.0	0.00	16.98	5.7
PRCH 103 Bt	1.7	4.3	0.0	0.00	10.58	4.1
Bunny (Check)	1.7	4.3	23.3	28.85	23.83	16.3
RCH 2Bt (Check)	1.7	4.3	0.0	0.00	13.72	5.1
RCH 368Bt (Check)	0.0	0.0	0.0	0.00	15.83	5.3
CD at 5%	8.5		5.56		-	
CV %	255.0		154.60		-	

**Open boll and Locule damage**

At harvest, the open boll and locule damage were studied.

Open boll damage was very low on all the hybrids at Coimbatore. At Guntur, the non Bt check hybrid Bunny recorded 10 per cent boll damage and it was nil or very low on Bt hybrids. On the other hand, boll damage was very high at Siruguppa, Nandyal and Dharwad on all the hybrids evaluated (Table 29).



**Table 29. Open boll damage at harvest (%)**

Entry	CBE		Siruguppa	Guntur		Nandyal		Dharwad		Mean
	O.V	T.V		O.V	T.V	O.V	T.V	O.V	T.V	
RCH 111 Bt	1.7	6.5	18.1	0.3	2.92	14.7	21.85	35.5	36.59	14.0
RCH 371 Bt	0.3	2.8	18.8	0.0	0.00	18.7	25.58	30.75	33.7	13.7
MRC6100 Bt	0.0	1.3	14.9	0.0	0.00	26.3	30.82	35.6	36.65	15.4
MRC 7228BGII	0.0	1.3	17.1	0.0	0.00	16.8	23.76	41.71	40.25	15.1
MRC 7351 BGII	0.0	1.3	16.1	0.0	0.00	32.3	34.40	38.15	38.16	17.3
NCS 913 Bt	0.0	1.3	21.2	0.0	0.00	33.5	35.14	38.7	38.49	18.7
JKCH 99 Bt	0.7	4.3	19.8	0.0	0.00	30.4	33.16	25.15	30.11	15.2
JKCH 10 Bt	0.7	4.3	17.5	0.0	0.00	20.3	26.36	29.3	32.79	13.6
JKCH 634 Bt	0.0	1.3	17.4	0.0	0.00	37.4	37.57	30.5	33.54	17.1
NCEH 2R Bt	0.0	1.3	21.1	0.0	0.00	42.9	41.86	31.44	34.12	19.1
NCEH 3R BT	0.0	1.3	21.6	0.0	0.00	31.2	33.41	35.23	36.43	17.6
Tulasi 4 Bt	0.3	2.8	18.5	0.0	0.00	27.8	31.55	30.17	33.33	15.4
Tulasi 117 Bt	0.7	3.6	16.3	0.0	0.00	30.4	33.26	32.77	34.94	16.0
NPH 2270 Bt	0.0	1.3	19.5	0.0	0.00	30.8	33.61	35.23	36.43	17.1
NPH 2171 Bt	0.0	1.3	19.2	1.7	4.31	23.8	28.85	21.5	27.64	13.2
Brahma Bt	0.0	1.3	16.2	0.0	0.00	43.1	40.99	30.25	33.38	17.9
Dhanwan Bt	0.0	1.3	15.7	0.0	0.00	57.4	49.27	24.15	29.45	19.4
GK 207 Bt	0.0	1.3	16.7	0.0	0.00	31.0	33.40	30	33.23	15.5
GK 209 Bt	0.0	1.3	17.4	0.0	0.00	19.1	25.67	25.22	30.16	12.3
ACH 33-1Bt	0.0	1.3	18.9	1.7	4.31	29.9	32.79	25.16	30.12	15.1
ACH 11-1Bt	0.0	1.3	19.6	3.3	8.61	23.8	28.92	30.75	33.7	15.5
ACH 21-1Bt	0.0	1.3	16.5	0.0	0.00	12.2	20.14	33.15	35.17	12.4
KDCHH 9632 Bt	0.0	1.3	17.5	0.0	0.00	27.9	31.87	30.65	33.63	15.2
KDCHH 441 BG II	0.0	1.3	17.2	0.0	0.00	26.9	31.25	21.73	27.8	13.2
PRCH 102 Bt	0.3	2.8	19.8	0.3	1.05	21.7	27.47	25.15	30.11	13.5
PRCH 103 Bt	0.0	1.3	17.6	0.0	0.00	25.7	30.47	31.72	34.3	15.0
Bunny (Check)	0.3	2.8	19.8	10.0	18.05	47.7	43.06	25.7	30.48	20.7
RCH 2Bt (Check)	0.3	2.8	18.8	0.0	0.00	27.7	30.93	23.1	28.74	14.0
RCH 368Bt (Check)	1.0	5.1	19.0	0.0	0.00	51.1	45.88	25.3	30.21	19.3
CD at 5%	3.0		3.9	3.8		12.4		5.9		
CV %	84.9		13.1	189.6		23.2		17.5		

The locule damage also followed the same trend. The non Bt check hybrid Bunny recorded the highest locule damage at all the centres and ranged from 3.7 to 44.3 per cent. The locule damage on Bt hybrids was low at Coimbatore and Guntur. It ranged from 6.6 to 14.8 percent at Siruguppa, 4.1 to 11.0 per cent at Dharwad and 8.8 to 30.9 per cent at Nandyal (Table 30).

**Table 30. Locule damage at harvest (%)**

Entry	CBE		Siruguppa	Guntur		Nandyal		Dharwad		Mean
	O.V	T.V		O.V	T.V	O.V	T.V	O.V	T.V	
RCH 111 Bt	0.0	1.3	12.7	0.1	0.76	9.2	17.36	8	16.44	6.0
RCH 371 Bt	0.7	3.6	8.3	0.0	0.00	18.4	25.31	7.05	15.41	6.9
MRC6100 Bt	0.0	1.3	8.1	0.0	0.00	22.4	28.13	6.15	14.37	7.3
MRC 7228BGII	0.0	1.3	9.1	0.0	0.00	14.8	20.53	6.71	15.02	6.1
MRC 7351 BGII	0.7	3.6	9.1	0.0	0.00	25.6	30.31	6.15	14.37	8.3
NCS 913 Bt	0.7	3.6	6.6	0.0	0.00	28.0	31.71	5.17	13.15	8.1
JKCH 99 Bt	0.0	1.3	13.1	0.0	0.00	26.8	30.93	4.15	11.76	8.8
JKCH 10 Bt	0.0	1.3	13.7	0.0	0.00	19.7	26.22	4.1	11.69	7.5
JKCH 634 Bt	0.0	1.3	12.5	0.0	0.00	25.1	29.97	6.65	14.95	8.8
NCEH 2R Bt	0.3	2.8	11.7	0.0	0.00	28.6	33.29	10.15	18.59	10.2
NCEH 3R BT	0.0	1.3	13.8	0.0	0.00	30.0	33.02	7.12	15.48	10.2
Tulasi 4 Bt	0.7	3.6	11.6	0.0	0.00	25.5	30.08	5.2	13.19	8.6
Tulasi 117 Bt	0.0	1.3	13.0	0.0	0.00	28.5	31.93	6.7	15.01	9.6
NPH 2270 Bt	0.0	1.3	12.1	0.0	0.00	26.6	30.98	5.15	13.12	8.8
NPH 2171 Bt	1.3	5.9	14.1	1.3	2.18	19.1	25.08	6.05	14.25	8.4
Brahma Bt	0.0	1.3	12.4	0.0	0.00	30.9	33.76	5.17	13.15	9.7
Dhanwan Bt	1.0	5.1	10.2	0.0	0.00	29.3	31.95	5.05	12.99	9.1
GK 207 Bt	0.0	1.3	9.9	0.0	0.00	22.9	28.06	6.71	15.02	7.9
GK 209 Bt	2.0	7.0	14.4	0.0	0.00	12.0	19.66	4.75	12.59	6.6
ACH 33-1Bt	1.7	6.5	10.9	0.4	2.10	21.1	26.69	7.05	15.41	8.2
ACH 11-1Bt	1.3	4.7	9.2	1.7	4.31	14.5	21.86	4.31	11.99	6.2
ACH 21-1Bt	0.3	2.8	13.8	0.0	0.00	8.8	17.21	6.87	15.2	6.0
KDCHH 9632 Bt	0.0	1.3	11.0	0.0	0.00	21.6	27.67	9.2	17.67	8.4
KDCHH 441 BG II	0.7	3.6	13.4	0.0	0.00	25.6	30.3	9.31	17.77	9.8
PRCH 102 Bt	0.7	3.6	10.9	0.1	0.54	24.9	29.89	9.15	17.62	9.1
PRCH 103 Bt	0.0	1.3	10.5	0.0	0.00	14.3	21.97	7.71	16.13	6.5
Bunny (Check)	3.7	11.0	14.8	6.3	14.31	44.3	41.73	11	19.38	16.0
RCH 2Bt (Check)	0.7	3.6	13.6	0.0	0.00	24.2	29.37	9.17	17.64	9.5
RCH 368Bt (Check)	0.7	3.6	9.9	0.0	0.00	10.4	58.72	6	14.19	5.4
CD at 5%	4.8		3.10	2.97		12.0		4.3		
CV %	93.9		16.45	222.6		25.35		10.9		

**Plant Protection Sprays**

Jassids, aphids and thrips were the predominant sucking pests. Myrid bug was noticed at Dharwad. All the entries tested were found to be susceptible to sucking pests and warranted chemical intervention at varying periods to keep them under check (Table 31).

**Table 31. No. of sprays for sucking pests**

Entry	Siruguppa	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	3	2	3	2	2.5
RCH 371 Bt	3	1	3	2	2.3
MRC6100 Bt	3	2	3	2	2.5
MRC 7228BGII	3	2	3	2	2.5
MRC 7351 BGII	3	2	3	2	2.5
NCS 913 Bt	3	1	3	2	2.3
JKCH 99 Bt	3	3	3	2	2.8
JKCH 10 Bt	3	2	2	2	2.3
JKCH 634 Bt	3	2	3	2	2.5
NCEH 2R Bt	3	0	3	2	2.0
NCEH 3R BT	3	0	3	2	2.0
Tulasi 4 Bt	3	2	3	2	2.5
Tulasi 117 Bt	3	2	3	2	2.5
NPH 2270 Bt	3	1	3	2	2.3
NPH 2171 Bt	3	2	3	2	2.5
Brahma Bt	3	1	3	2	2.3
Dhanwan Bt	3	1	3	2	2.3
GK 207 Bt	3	2	3	2	2.5
GK 209 Bt	3	2	3	2	2.5
ACH 33-1Bt	3	1	3	2	2.3
ACH 11-1Bt	3	1	3	2	2.3
ACH 21-1Bt	3	0	3	2	2.0
KDCHH 9632 Bt	3	1	2	2	2.0
KDCHH 441 BG II	3	2	3	2	2.5
PRCH 102 Bt	3	0	3	2	2.0
PRCH 103 Bt	3	2	3	2	2.5
Bunny (Check)	3	2	3	2	2.5
RCH 2Bt (Check)	3	2	3	2	2.5
RCH 368Bt (Check)	3	2	3	2	2.5

Bollworm damage was very negligible at Coimbatore and did not require any chemical intervention. At Guntur and Dharwad it was low and a maximum of single intervention was required on certain entries. At Nandyal one to four rounds of application were required. At Dharwad single application was required for all the entries (Table 32).

**Table 32. No. of spray for bollworms**

Entry	CBE	Siruguppa	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	0	3	0	2	1	1.2
RCH 371 Bt	0	3	0	2	1	1.2

MRC6100 Bt	0	3	1	1	1	1.2
MRC 7228BGII	0	3	0	2	1	1.2
MRC 7351 BGII	0	3	0	1	1	1.0
NCS 913 Bt	0	3	0	2	1	1.2
JKCH 99 Bt	0	3	0	3	1	1.4
JKCH 10 Bt	0	3	1	1	1	1.2
JKCH 634 Bt	0	3	1	1	1	1.2
NCEH 2R Bt	0	3	0	2	1	1.2
NCEH 3R BT	0	3	0	3	1	1.4
Tulasi 4 Bt	0	3	0	2	1	1.2
Tulasi 117 Bt	0	3	0	1	1	1.0
NPH 2270 Bt	0	3	1	2	1	1.4
NPH 2171 Bt	0	3	1	2	1	1.4
Brahma Bt	0	3	0	2	1	1.2
Dhanwan Bt	0	3	1	2	1	1.4
GK 207 Bt	0	3	0	2	1	1.2
GK 209 Bt	0	3	1	3	1	1.6
ACH 33-1Bt	0	3	0	3	1	1.4
ACH 11-1Bt	0	3	0	4	1	1.6
ACH 21-1Bt	0	3	0	2	1	1.2
KDCHH 9632 Bt	0	3	1	2	1	1.4
KDCHH 441 BG II	0	3	0	2	1	1.2
PRCH 102 Bt	0	3	1	2	1	1.4
PRCH 103 Bt	0	3	1	3	1	1.6
Bunny (Check)	0	3	1	3	1	1.6
RCH 2Bt (Check)	0	3	1	2	1	1.4
RCH 368Bt (Check)	0	3	1	1	1	1.2

## 2. EVALUATION UNDER UNPROTECTED CONDITIONS

All the twenty six entries were also evaluated under unsprayed conditions for bollworms. However, they were protected against sucking pests.

The open boll and locule damage were assessed at harvest. Open boll damage was less than two per cent at Coimbatore and Guntur. However, it varied from 19.9 to 60.95 per cent at other centres. Even though, maximum open boll damage was noticed in non Bt check hybrid Bunny, the open boll damage, was considerable on Bt hybrids also at these centres (Table 33).

**Table 33. Open boll damage at harvest (%) under unprotected condition**

Entry	CBE		Siruguppa	Guntur		Nandyal		Dharwad		Mean
	O.V	T.V		O.V	T.V	O.V	T.V	O.V	T.V	
RCH 111 Bt	2.3	8.5	25.0	1.2	3.67	16.4	23.2	40.91	39.79	17.17
RCH 371 Bt	0.7	4.3	23.6	1.3	3.47	20.4	26.8	34.26	35.84	16.03

MRC6100 Bt	0.0	1.3	19.8	0.3	1.67	27.7	31.7	39.81	39.14	17.50
MRC 7228BGII	0.0	1.3	22.9	0.0	0.00	18.1	24.8	37.62	37.85	15.72
MRC 7351 BGII	0.0	1.3	20.3	0.0	0.00	33.3	35.0	38.36	38.29	18.39
NCS 913 Bt	0.0	1.3	23.7	0.6	3.55	36.1	36.1	31.53	34.18	18.38
JKCH 99 Bt	1.0	5.1	23.7	0.9	3.10	32.1	34.2	32.01	34.48	17.93
JKCH 10 Bt	1.0	5.1	24.0	0.4	2.01	22.0	27.6	35.91	36.83	16.65
JKCH 634 Bt	0.0	1.3	25.5	0.0	0.00	39.4	38.8	33.14	35.16	19.60
NCEH 2R Bt	0.0	1.3	23.2	0.0	0.00	44.4	41.7	36.66	37.28	20.85
NCEH 3R BT	1.0	5.1	23.9	0.0	0.00	28.9	34.2	47	43.3	20.16
Tulasi 4 Bt	1.0	5.1	25.7	0.0	0.00	29.3	32.5	44.14	41.66	20.02
Tulasi 117 Bt	0.3	2.8	24.8	0.0	0.00	31.8	34.1	36.82	37.38	18.74
NPH 2270 Bt	0.0	1.3	23.5	0.0	0.00	32.1	34.4	28.95	32.57	16.91
NPH 2171 Bt	0.3	2.8	24.8	0.0	0.00	24.8	29.6	31.69	34.28	16.32
Brahma Bt	0.0	1.3	21.6	0.1	1.25	44.5	39.7	34.82	36.18	20.22
Dhanwan Bt	0.3	2.8	22.1	0.0	0.00	29.0	49.7	33.14	35.16	16.92
GK 207 Bt	0.3	2.8	25.1	0.0	0.00	33.3	34.9	29.14	32.69	17.57
GK 209 Bt	0.0	1.3	20.4	0.0	0.00	19.4	25.9	35.08	36.34	14.99
ACH 33-1Bt	0.0	1.3	23.3	0.2	1.60	33.3	35.1	31.55	34.19	17.67
ACH 11-1Bt	0.3	2.8	24.2	0.2	1.40	20.1	26.5	28.75	32.44	14.71
ACH 21-1Bt	0.0	1.3	23.1	0.4	2.09	22.8	28.1	38.41	38.32	16.96
KDCHH 9632 Bt	0.0	1.3	22.4	0.1	1.18	18.5	25.1	41.55	40.16	16.52
KDCHH 441 BG II	0.3	2.8	19.9	0.0	0.00	34.7	36.0	40.91	39.78	19.17
PRCH 102 Bt	0.7	4.3	23.7	0.0	0.00	28.2	32.0	31.66	34.26	16.85
PRCH 103 Bt	0.0	1.3	24.5	0.0	0.00	19.4	25.1	28.64	32.37	14.51
Bunny (Check)	0.7	4.3	26.3	1.1	5.95	49.4	44.2	60.95	51.35	27.68
RCH 2Bt (Check)	0.7	3.6	25.2	0.0	0.00	29.4	32.1	45.03	42.17	20.05
RCH 368Bt (Check)	0.7	4.3	24.0	0.0	0.00	52.2	44.5	42.53	40.72	23.87
CD at 5%	5.0		NS	NS		12.9		10.6		
CV %	69.1		12.3	-		33.8		15.35		

The same trend was noticed for locule damage also (Table 34).

**Table 34. Locule damage at harvest (%) under unprotected condition**

Entry	CBE		Siruguppa	Guntur		Nandyal		Dharwad		Mean
	O.V	T.V		O.V	T.V	O.V	T.V	O.V	T.V	
RCH 111 Bt	0.0	1.3	14.9	0.3	1.83	11.0	18.96	9.56	18.02	7.2
RCH 371 Bt	0.3	2.8	12.5	0.3	1.84	20.4	28.80	8.07	16.51	8.3
MRC6100 Bt	0.0	1.3	9.6	0.0	0.00	24.1	29.31	7.46	15.86	8.2
MRC 7228BGII	0.0	1.3	10.6	0.0	0.00	16.1	21.95	8.1	16.55	7.0
MRC 7351 BGII	0.7	3.6	9.6	0.0	0.00	28.1	31.83	7.72	16.14	9.2
NCS 913 Bt	0.3	2.8	13.3	0.3	2.03	32.7	34.68	6.63	14.93	10.6
JKCH 99 Bt	0.7	4.3	14.2	0.2	1.53	28.3	32.24	5.26	13.27	9.7
JKCH 10 Bt	0.0	1.3	15.5	0.1	0.81	21.4	27.41	4.8	12.66	8.4
JKCH 634 Bt	0.0	1.3	14.4	0.0	0.00	26.0	30.59	7.9	16.33	9.7
NCEH 2R Bt	0.3	2.8	14.6	0.0	0.00	33.6	35.32	13.2	21.31	12.3

NCEH 3R Bt	0.0	1.3	16.0	0.0	0.00	32.0	34.29	9.52	17.98	11.5
Tulasi 4 Bt	0.3	2.8	12.6	0.0	0.00	26.8	30.96	6.21	14.44	9.2
Tulasi 117 Bt	0.0	1.3	13.7	0.0	0.00	31.1	33.69	8.02	16.46	10.6
NPH 2270 Bt	0.0	1.3	12.9	0.0	0.00	27.9	31.85	6.29	14.53	9.4
NPH 2171 Bt	1.0	5.1	15.3	0.0	0.00	42.1	26.10	7.18	15.55	13.1
Brahma Bt	0.3	2.8	13.8	0.0	0.63	40.2	39.24	6.4	14.66	12.2
Dhanwan Bt	1.3	6.5	12.4	0.0	0.00	45.6	42.45	5.45	13.51	13.0
GK 207 Bt	0.0	1.3	10.7	0.0	0.00	24.2	29.01	8.11	16.55	8.6
GK 209 Bt	0.0	1.3	15.5	0.0	0.00	13.4	21.04	5.04	12.98	6.8
ACH 33-1Bt	1.3	6.5	11.8	0.2	1.38	27.8	31.39	8.04	16.48	9.8
ACH 11-1Bt	0.7	3.6	10.5	0.0	0.66	18.4	25.34	6.3	14.54	7.2
ACH 21-1Bt	0.3	2.8	13.0	0.1	1.03	15.5	22.96	9.81	18.27	7.7
KDCHH 9632 Bt	0.0	1.3	11.4	0.0	0.57	18.5	25.02	11.13	19.49	8.2
KDCHH 441 BG II	0.3	2.8	15.7	0.0	0.00	29.6	32.79	10.33	18.76	11.2
PRCH 102 Bt	0.7	3.6	11.6	0.0	0.00	26.5	29.77	12.15	20.41	10.2
PRCH 103 Bt	0.0	1.3	12.0	0.0	0.00	16.4	22.71	8.95	17.42	7.5
Bunny (Check)	2.7	9.1	16.2	0.6	4.21	46.2	42.72	16.82	24.23	16.5
RCH 2Bt (Check)	1.7	7.2	15.1	0.0	0.00	25.6	30.29	12.01	20.28	10.9
RCH 368Bt (Check)	0.7	3.6	11.4	0.0	0.00	37.3	37.53	6.16	14.38	11.1
CD at 5%	3.64		3.63	1.82		10.05		5.46		
CV %	73.60		16.93	199.70		20.28		20.25		

## E. MEAN SEED COTTON YIELD UNDER UN PROTECTED CONDITIONS

### (i) Irrigated

The non Bt check hybrid Bunny recorded the lowest yield in the trial with a mean seed cotton yield of 1587 kg/ha. All the test entries recorded higher yield ranging from 4 to 66 per cent (Table 35).

Among the Bt checks, RCH 368 Bt was higher yielding (2346 kg/ha) and nine test hybrids out yielded the check by 1 to 13 per cent. They are, MRC 6100 Bt (2642 kg/ha), RCH 371 Bt (2542 kg/ha), MRC 7351 BG II (2441 Kg/ha), Dhanwan Bt (2432 Kg/ha), Tulasi 4 Bt (2430 Kg/ha), Brahma Bt (2426 Kg/ha), Tulasi 117 Bt (2394 Kg/ha), ACH 33-1 Bt (2378 Kg/ha) and GK 207 Bt (2349 Kg/ha),

### (ii). Rainfed

The non Bt check hybrid Bunny recorded the lowest yield of 1145 kg/ha and all the test entries were superior to it by 15 to 80 per cent (Table 35).

Among the Bt check hybrids, RCH 2 Bt recorded the highest yield with 1428 kg/ha. As many as twenty hybrids out yielded all the three check hybrids. The yield increase of these hybrids over RCH 2 Bt was of the order of 5 to 44 per cent. They are MRC 6100 Bt (2062 kg/ha), NCEH 3R Bt (1950 kg/ha), RCH 371 Bt (1925

Kg/ha), GK 209 Bt (1906 Kg/ha), JKCH 99 Bt (1885 Kg/ha), ACH 21-1 Bt (1878 Kg/ha), Tulasi 4 Bt (1870 Kg/ha), NCS 913 Bt (1836 Kg/ha), RCH 111 Bt (1828 Kg/ha), ACH 11-1 Bt (1808 Kg/ha), Dhanwan Bt (1789 Kg/ha), Tulasi 117 Bt (1784 Kg/ha), Brahma Bt (1765 Kg/ha), ACH 33-1 Bt (1704 Kg/ha), MRC 7228 BG II (1696 Kg/ha), KDCHH 9632 Bt (1694 Kg/ha), MRC 7351 BG II (1663 Kg/ha), NPH 2171 Bt (1659 Kg/ha), PRCH 102 Bt (1526 Kg/ha) and JKCH 10 Bt (1503 Kg/ha).

**Table 35. Seed cotton yield (Kg/ha) under unprotected condition**

Entry	Irrigated			Rainfed			
	CBE	Siruguppa	Mean	Guntur	Nandyal	Dharwad	Mean
RCH 111 Bt	1311	2423	1867	2425	1337	1721	1828
RCH 371 Bt	2286	2798	2542	2532	1393	1850	1925
MRC6100 Bt	1985	3299	2642	2807	1527	1853	2062
MRC 7228BGII	1946	2676	2311	2595	801	1692	1696
MRC 7351 BGII	1817	3064	2441	2514	741	1734	1663
NCS 913 Bt	1763	2655	2209	2745	1108	1656	1836
JKCH 99 Bt	1761	2159	1960	1762	1500	2393	1885
JKCH 10 Bt	1539	2247	1893	1964	842	1703	1503
JKCH 634 Bt	1411	2493	1952	1305	1114	1518	1312
NCEH 2R Bt	1568	2497	2033	1821	330	1792	1314
NCEH 3R BT	1853	2602	2228	2574	1601	1675	1950
Tulasi 4 Bt	1884	2976	2430	2701	895	2015	1870
Tulasi 117 Bt	1884	2904	2394	2087	1225	2041	1784
NPH 2270 Bt	1582	2180	1881	1533	975	1699	1402
NPH 2171 Bt	1420	2188	1804	2044	1311	1622	1659
Brahma Bt	2100	2751	2426	2594	678	2022	1765
Dhanwan Bt	1879	2985	2432	2739	245	2384	1789
GK 207 Bt	1725	2972	2349	1686	766	1543	1332
GK 209 Bt	1840	2606	2223	2389	1412	1916	1906
ACH 33-1Bt	1998	2758	2378	1879	1289	1945	1704
ACH 11-1Bt	1303	2427	1865	2255	1554	1614	1808
ACH 21-1Bt	1692	2686	2189	1906	2073	1654	1878
KDCHH 9632 Bt	1716	2538	2127	1648	1849	1585	1694
KDCHH 441 BG II	1148	2143	1646	1635	997	1616	1416
PRCH 102 Bt	1848	2493	2171	2341	745	1492	1526
PRCH 103 Bt	1817	2593	2205	1940	550	1521	1337
Bunny (Check)	1735	1438	1587	2033	139	1262	1145
RCH 2Bt (Check)	1735	2352	2044	2022	616	1647	1428
RCH 368Bt (Check)	2023	2669	2346	1906	398	1625	1310
CD at 5%	388	435.62	-	5.34	514	259.04	-
CV %	13.6	10.37	-	15.38	26.42	9.09	-

## F. PATHOLOGICAL EVALUATION

During this year, high incidences of *Alternaria* leaf spot and grey mildew were observed in Guntur, Dharwad and Siruguppa at all centres and bacterial leaf blight at Dharwad and Siruguppa. There was low incidences of *Alternaria* leaf spot and grey mildew at Coimbatore.

### **Alternaria leaf spot**

At high disease pressure, the disease incidence ranged from 13.67 to 46.72 per cent and at low disease pressure, the incidence ranged from 1.36 to 4.63 per cent. All the test hybrids as well as the check hybrids have been found susceptible to *Alternaria* leaf spot (Table 36).

### **Bacterial leaf blight**

The per cent disease incidence at Dharwad and Siruguppa ranged from 8.62 to 31.7 per cent. The highest incidence was noticed in Dharwad and lowest in the trials at Siruguppa (Table 36). All hybrids were susceptible.

**Table 36. Alternaria leaf spot and Bacterial leaf blight incidences on Bt cotton**

Entries	Alternaria leaf spot							Bacterial leaf blight			
	CBE	Guntur		Dharwad		Siruguppa		Dharwad		Siruguppa	
		O.V	T.V	O.V	T.V	O.V	T.V	O.V	T.V	O.V	T.V
RCH 111 Bt	4.3	17.3	24.6	26.9	31.2	11.7	20.0	29.4	32.8	8.6	17.1
RCH 371 Bt	4.6	21.1	27.3	28.8	32.5	26.1	30.7	27.0	31.3	14.3	22.2
MRC6100 Bt	2.4	28.7	33.0	26.8	31.2	46.7	43.1	31.7	34.3	11.9	20.2
MRC 7228BGII	3.6	20.3	26.7	22.3	29.2	30.1	33.3	28.2	32.0	11.8	20.1
MRC 7351 BGII	2.3	21.0	27.2	25.6	30.4	27.5	31.6	28.7	32.4	15.8	23.4
NCS 913 Bt	2.9	25.3	29.9	25.9	30.6	33.8	35.6	27.0	31.3	13.5	21.6
JKCH 99 Bt	1.7	25.5	30.2	24.8	29.9	31.9	34.4	29.6	33.0	13.3	21.4
JKCH 10 Bt	2.4	29.0	32.6	25.9	30.6	33.3	35.2	27.9	31.9	11.5	19.8
JKCH 634 Bt	3.3	30.7	33.6	25.1	30.1	32.8	34.9	27.3	31.5	13.4	21.5
NCEH 2R Bt	2.4	25.3	30.2	26.5	31.0	29.0	32.6	27.1	31.4	10.8	19.2
NCEH 3R BT	2.6	18.5	26.1	23.7	29.1	26.6	31.1	29.0	32.6	11.5	19.8
Tulasi 4 Bt	3.1	22.3	28.2	25.4	30.3	31.1	33.9	27.0	31.3	10.5	18.9
Tulasi 117 Bt	3.3	26.6	31.0	23.4	28.9	31.9	34.4	27.4	31.6	14.8	22.6
NPH 2270 Bt	2.6	21.3	27.4	23.5	29.0	29.6	33.0	28.8	32.5	16.3	23.8
NPH 2171 Bt	1.7	19.8	26.4	25.6	30.4	29.6	33.0	30.2	33.3	13.2	21.3
Brahma Bt	1.6	19.7	26.3	23.6	29.1	31.0	33.8	27.8	31.8	12.0	20.3
Dhanwan Bt	1.4	19.8	26.3	23.5	29.0	28.1	32.0	28.3	32.1	12.1	20.4
GK 207 Bt	2.4	23.3	28.8	25.6	30.4	24.9	29.9	28.0	32.0	13.4	21.5
GK 209 Bt	2.3	17.5	25.0	24.9	29.9	27.2	31.4	26.6	31.1	13.2	21.3
ACH 33-1Bt	2.4	21.0	27.2	23.3	28.9	27.6	31.7	24.6	26.7	11.6	19.9
ACH 11-1Bt	1.4	13.7	21.7	19.6	26.3	24.9	29.9	27.4	31.4	12.9	21.1
ACH 21-1Bt	1.4	16.6	24.0	20.2	29.6	24.2	29.5	25.8	30.5	15.8	23.4



KDCHH 9632 Bt	2.7	25.8	30.5	25.0	30.0	25.7	30.5	26.9	31.2	12.6	20.8
KDCHH 441 BG II	3.1	21.7	27.7	25.9	30.6	23.1	28.7	30.5	33.5	11.7	20.0
PRCH 102 Bt	2.9	16.7	24.1	24.9	29.9	28.9	32.5	28.3	32.1	14.4	22.3
PRCH 103 Bt	3.3	23.3	28.9	24.0	29.3	29.7	33.0	29.1	32.7	13.8	21.8
Bunny (Check)	2.3	27.7	31.7	23.8	29.2	33.5	35.4	28.2	32.1	11.3	19.6
RCH 2Bt (Check)	2.4	28.4	32.2	24.6	29.8	27.9	31.9	29.4	32.8	10.4	18.8
RCH 368Bt (Check)	2.0	26.5	30.9	24.6	29.7	28.1	32.0	29.4	32.8	11.5	19.8
C.D. at 5%		4.2		NS		NS		NS		NS	
C.V.		9.2		11.8		17.1		6.0		13.7	

### Grey mildew

Among the three centres *viz.*, Guntur, Dharwad and Siruguppa where very high incidence of this disease was noticed with the PDI ranged from 15.3 to 40.41 per cent. All entries are susceptible. At Coimbatore, only few hybrids *viz.*, RCH 111 Bt, RCH 371 Bt, JKCH 99 Bt, Tulasi 4 Bt, Brahma Bt, Dhanwan Bt, ACH 11-1 Bt and ACH 21-1 Bt showed susceptibility (Table 37).

**Table 37. Incidence of Grey mildew on Bt cotton**

Entries	Grey mildew						
	CBE	Guntur		Dharwad		Siruguppa	
		O.V	T.V	O.V	T.V	O.V	T.V
RCH 111 Bt	10.0	15.3	23.0	30.7	33.7	35.2	36.4
RCH 371 Bt	12.5	17.3	24.5	26.3	30.9	36.7	37.3
MRC6100 Bt	0.0	19.7	26.3	24.8	29.9	37.3	37.6
MRC 7228BGII	0.0	21.7	27.7	24.1	29.4	36.0	37.1
MRC 7351 BGII	0.0	21.2	27.4	25.8	30.5	36.0	36.9
NCS 913 Bt	0.0	27.7	31.7	27.1	31.4	36.2	37.0
JKCH 99 Bt	16.4	19.5	26.1	24.6	29.7	35.3	36.5
JKCH 10 Bt	0.0	28.2	32.0	30.8	31.7	30.8	33.7
JKCH 634 Bt	0.0	21.7	27.7	25.4	30.3	34.0	35.7
NCEH 2R Bt	0.0	30.7	33.6	24.9	29.9	33.9	35.6
NCEH 3R BT	0.0	20.7	27.0	22.6	28.4	33.6	35.4
Tulasi 4 Bt	9.7	27.2	31.4	23.8	29.2	29.8	33.1
Tulasi 117 Bt	0.0	24.9	29.9	25.5	30.3	29.7	33.0
NPH 2270 Bt	0.0	24.5	29.6	23.7	29.1	40.4	39.5
NPH 2171 Bt	0.0	16.0	23.5	24.3	29.5	33.3	35.2
Brahma Bt	15.6	18.0	25.1	23.2	28.8	35.1	36.1
Dhanwan Bt	12.8	17.0	24.2	20.5	26.9	32.6	34.8
GK 207 Bt	0.0	22.4	28.2	22.8	28.5	35.4	36.5
GK 209 Bt	12.3	26.8	31.2	23.8	29.2	35.2	36.4
ACH 33-1Bt	9.7	17.2	24.4	22.8	28.5	36.0	36.9
ACH 11-1Bt	10.4	20.2	26.6	23.2	28.8	35.9	36.8
ACH 21-1Bt	10.6	18.3	25.3	26.0	30.7	33.7	35.5

KDCHH 9632 Bt	0.0	22.3	28.2	23.2	28.8	36.3	37.1
KDCHH 441 BG II	0.0	28.5	32.0	25.0	30.0	32.9	35.0
PRCH 102 Bt	0.0	18.3	25.3	23.6	29.1	31.1	33.9
PRCH 103 Bt	0.0	17.8	24.9	25.4	30.3	23.5	29.0
Bunny (Check)	0.0	20.0	26.5	24.6	29.7	33.3	35.2
RCH 2Bt (Check)	12.6	18.0	25.1	25.2	30.1	31.5	34.1
RCH 368Bt (Check)	12.9	31.0	30.5	23.8	29.2	36.3	37.1
C.D. at 5%		3.8		NS		NS	
C.V.		8.7		6.0		9.4	

## G. OVERALL ASSESSMENT

Twenty six Bt cotton hybrids were evaluated under both protected and unprotected conditions along with Bunny (non Bt check), RCH 2 Bt and RCH 368 Bt (Bt checks). The trial was conducted under Irrigated Conditions at Coimbatore and Siruguppa and under rainfed conditions at Guntur, Nandyal and Dharwad.

Even though the larval population of Bollworms was low to moderate, considerable square damage was noticed at Siruguppa, Nandyal and Dharwad. However, the level of incidence was more on non Bt check Bunny and less on most of the Bt entries. Boll and locule damage was also more at Siruguppa, Nandyal and Dharwad and less at Coimbatore and Guntur.

Jassid was the main sucking pest noticed at all locations. Sucking pest damage warranted chemical intervention at all the centres. However, the reaction of Bt entries differed and required 0 to 2 rounds of application in most of the cases.

Under high disease pressure, all the entries including the check entries were found susceptible to *Alternaria* leaf spot, bacterial leaf blight and grey mildew.

For seed cotton yield all the hybrids evaluated, except JKCH 634 Bt, were better than the non Bt check hybrid Bunny under both protected and unprotected conditions.

As compared to the Best Bt check hybrid, entries MRC 6100 Bt, Brahma Bt, Dhanwan Bt, RCH 371 Bt, Tulasi 117 Bt, Tulasi 4 Bt, MRC 7351 BG II and NCS 913 Bt were found to be superior both under irrigated and rainfed conditions. These hybrids barring NCS 913 under irrigated condition were also superior to the Bt check under unprotected conditions. Entries GK 207 Bt, GK 209 Bt, ACH 33-1 Bt and PRCH 103 Bt were found superior under irrigated conditions. Of these, GK 207 Bt and ACH 33-1 Bt were also superior under unprotected conditions. Entries NCEH 3R Bt, MRC 7228 BG II and RCH 111 Bt were superior under rainfed situations only under both protected and unprotected conditions.

## SECOND YEAR INTERSPECIFIC HYBRID EVALUATION

One interspecific Bt cotton hybrid RCHB 708 Bt was evaluated at three locations Viz., Dharwad, Vaigaidam and Coimbatore. DCH 32, TCHB 213 and DHB 105 were the non-Bt check hybrids.

### A. BIOMETRICAL EVALUATION

Biometrical evaluations were made in the protected trial. The plant stand was adequate in all the entries, except DCH 32, at all locations (Table 1 and 2).

**Table 1. Germination (%)**

Entry	Vaigaidam
RCHB 708 Bt	94.0
DCH 32 (cc)	81.5
TCHB 213 (cc)	96.5
DHB 105 (cc)	89.5
CD at 5%	4.2
CV %	3.4

**Table 2. Final plant stand (Number)**

Entry	CBE	Vaigaidam	Mean
RCHB 708 Bt	48.2	37.2	42.7
DCH 32 (cc)	43.8	32.2	38.0
TCHB 213 (cc)	49.4	38.0	43.7
DHB 105 (cc)	56.0	35.4	45.7
CD at 5%	5.0	2.6	
CV %	7.3	5.3	

Mean flowering date, boll number, boll weight and ginning out turn are furnished in the tables below (Table 3 to 9).

**Table 3. First flowering (days)**

Entry	CBE	Vaigaidam	Mean
RCHB 708 Bt	58.4	48.0	53.2
DCH 32 (cc)	57.2	45.4	51.3
TCHB 213 (cc)	58.2	43.8	51.0
DHB 105 (cc)	58.2	43.0	50.6
CD at 5%	2.2	1.7	
CV %	2.8	2.8	

**Table 4. 50% flowering (days)**

Entry	CBE	Vaigaidam	Mean
RCHB 708 Bt	64.4	54.4	59.4

DCH 32 (cc)	62.8	55.0	58.9
TCHB 213 (cc)	62.8	58.0	60.4
DHB 105 (cc)	63.0	55.6	59.3
CD at 5%	2.5	NS	
CV %	2.3	3.4	

**Table 5. Bolls/plant**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	48.1	60.8	15.2	41.3
DCH 32 (cc)	53.6	44.4	12.8	36.9
TCHB 213 (cc)	38.2	64.0	10.0	37.4
DHB 105 (cc)	34.2	40.4	11.3	28.6
CD at 5%	5.9	7.2	6.0	
CV %	8.8	10.0	1.1	

**Table 6. Boll weight (g)**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	5.0	4.1	3.5	4.2
DCH 32 (cc)	4.8	4.4	3.4	4.2
TCHB 213 (cc)	4.9	4.2	3.3	4.2
DHB 105 (cc)	4.5	3.9	3.3	3.9
CD at 5%	0.5	0.3	NS	
CV %	7.2	5.3	4.2	

**Table 7. Ginning out turn (%)**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	32.2	32.0	30.4	31.6
DCH 32 (cc)	34.7	34.5	32.3	33.8
TCHB 213 (cc)	32.1	33.8	29.7	31.9
DHB 105 (cc)	36.0	34.8	33.0	34.6
CD at 5%	2.1	1.3	2.5	
CV %	4.6	2.8	1.5	

**Table 8. Lint index (g)**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	7.2	7.2	5.3	6.5
DCH 32 (cc)	6.8	6.8	6.4	6.7
TCHB 213 (cc)	6.4	6.2	6.2	6.3
DHB 105 (cc)	6.0	6.5	6.5	6.3
CD at 5%	0.9	0.4	0.4	
CV %	9.5	4.3	3.4	

**Table 9. Seed index (g)**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	15.1	14.2	13.0	14.1
DCH 32 (cc)	13.0	12.3	10.7	12.0
TCHB 213 (cc)	13.5	12.1	11.3	12.3
DHB 105 (cc)	10.7	12.1	10.2	11.0
CD at 5%	2.0	1.0	0.8	
CV %	11.2	5.4	3.3	

It may be seen from the tables above that the test entry RCHB 708 Bt did not differ from the other check hybrids in respect of flowering and boll weight. The test hybrid recorded higher boll number as compared to other hybrids. Regarding ginning out turn, eventhough it was on par with TCHB 213 (CC), it was inferior to DCH 32 and DHB 105 (CC).

#### **B. MEAN SEED COTTON YIELD UNDER PROTECTED CONDITIONS**

The Bt cotton entry RCHB 708 Bt recorded the highest mean seed cotton yield of 1771 Kg/ha under protected condition and was superior to all the three check hybrids. At Coimbatore and Dharwad, the yield differences were significant. At Vaigaidam, it was on par with TCHB 213 (C) and significantly superior to the other two check hybrids (Table 10).

**Table 10. Seed cotton yield (Kg/ha) under protected condition**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	2018	1870	1425	1771
DCH 32 (cc)	1082	1464	1247	1264
TCHB 213 (cc)	1577	2028	561	1389
DHB 105 (cc)	1236	1175	1011	1141
CD at 5%	185.3	261.1	73.0	
CV %	8.3	11.6	17.4	

#### **C. FIBRE QUALITY EVALUATION**

The fibre quality characteristics are furnished below (Table 11 to 16 ).

**Table 11. 2.5% span length (mm)**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	35.8	36.2	33.0	35.0
DCH 32 (cc)	38.1	36.6	33.5	36.1
TCHB 213 (cc)	36.2	35.3	32.4	34.6
DHB 105 (cc)	32.5	33.6	28.5	31.5

**Table 12. Micronaire**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	3.7	3.9	3.6	3.7
DCH 32 (cc)	3.7	3.7	3.4	3.6
TCHB 213 (cc)	3.7	3.6	3.1	3.5
DHB 105 (cc)	4.0	3.7	3.7	3.8

**Table13. Fibre strength (g/tex)**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	26.5	25.8	24.7	25.7
DCH 32 (cc)	25.2	24.3	23.9	24.5
TCHB 213 (cc)	24.2	24.6	23.9	24.2
DHB 105 (cc)	23.0	24.3	23.2	23.5

**Table14. Uniformity ratio (%)**

Entry	CBE	Dharwad	Mean
RCHB 708 Bt	46.0	46.0	46.0
DCH 32 (cc)	46.0	43.0	44.5
TCHB 213 (cc)	47.0	45.0	46.0
DHB 105 (cc)	47.0	47.0	47.0

**Table 15. Elongation (%)**

Entry	CBE	Dharwad	Mean
RCHB 708 Bt	7.6	5.0	6.3
DCH 32 (cc)	7.6	5.5	6.6
TCHB 213 (cc)	7.7	5.2	6.5
DHB 105 (cc)	8.5	5.1	6.8

**Table 16. Overall fibre properties**

Entry	2.5% span length (mm)	Uniformity ratio (%)	Micronaire	Strength g/tex	Elongation (%)
RCHB 708 Bt	35.0	46	3.7	25.7	6.3
DCH 32 (cc)	36.1	45	3.6	24.5	6.6
TCHB 213 (cc)	34.6	46	3.5	24.2	6.5
DHB 105 (cc)	31.5	47	3.8	23.5	6.8

It may be seen from the tables that the test hybrid was superior to the check hybrids with better micronaire and fibre strength.

## D. ENTOMOLOGICAL EVALUATION

### 1. EVALUATION UNDER PROTECTED CONDITIONS

In respect of sucking pests, all the hybrids tested were susceptible to jassids and aphids and needed chemical intervention. Thrips damage was noticed at Dharwad and whitefly damage was negligible (Table 17 to 20).

**Table 17. Jassids population/ Plant**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	3.3	3.9	4.31	3.8
DCH 32 (cc)	2.7	3.9	4.08	3.5
TCHB 213 (cc)	3.3	3.8	4.91	4.0
DHB 105 (cc)	3.7	3.9	5.55	4.4

**Table 18. Thrips population/ Plant**

Entry	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	1.5	37.27	19.4
DCH 32 (cc)	1.6	44.87	23.3
TCHB 213 (cc)	1.6	43.27	22.4
DHB 105 (cc)	1.5	48.53	25.0

**Table 19. Aphids population/ Plant**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	44.8	6.8	14.85	22.2
DCH 32 (cc)	36.8	6.9	14.18	19.3
TCHB 213 (cc)	31.1	7.2	13.71	17.3
DHB 105 (cc)	38.7	7.1	16.63	20.8

**Table 20. Whitefly population/ Plant**

Entry	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	1.0	1.47	1.3
DCH 32 (cc)	1.0	0.53	0.8
TCHB 213 (cc)	1.0	1.20	1.1
DHB 105 (cc)	1.0	1.00	1.0

Larval population of *Helicoverpa armigera* at Coimbatore and Vaigaidam and *Earias* population at Vaigaidam were minimal. However, at Dharwad larval population of *H. armigera* was noticed from 45 days onwards (Table 21 and 22).

**Table 21. Helicoverpa larvae (No./ 5 Plants)**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	0.3	0.4	3.94	1.5

DCH 32 (cc)	0.2	0.4	4.36	1.7
TCHB 213 (cc)	0.2	0.4	5.46	2.0
DHB 105 (cc)	0.0	0.5	5.72	2.1

**Table 22. Earias larvae (No./ 5 Plants)**

Entry	Vaigaidam
RCHB 708 Bt	0.4
DCH 32 (cc)	0.6
TCHB 213 (cc)	0.4
DHB 105 (cc)	0.6

Pink boll worm larvae was minimal at Coimbatore and appeared only after 120 DAS at Vaigaidam and Dharwad. Boll damage due to bollworms ranged from seven to nine per cent at Vaigaidam and 16 to 20 per cent at Dharwad (Table 23 and 24).

**Table 23. *Pectinophora gossypiella* no. of larvae/20 green bolls**

Entry	CBE		Vaigaidam	Dharwad	Mean
	O.V	T.V			
RCHB 708 Bt	0.0	0.2	5.2	1.4	2.2
DCH 32 (cc)	0.2	0.4	7.5	2.3	3.3
TCHB 213 (cc)	0.2	0.4	6.2	2.1	2.8
DHB 105 (cc)	0.0	0.2	6.7	3.3	3.3
CD at 5%	0.3		-		
CV %	83.4		-		

**Table 24. Green boll damage (%)**

Entry	CBE		Vaigaidam	Dharwad	Mean
	O.V	T.V			
RCHB 708 Bt	1.0	2.6	7.2	16.4	8.2
DCH 32 (cc)	1.0	2.6	8.7	15.4	8.4
TCHB 213 (cc)	1.0	2.6	7.4	19.5	9.3
DHB 105 (cc)	1.0	2.6	8.0	17.5	8.8
CD at 5%	7.7		-		
CV %	223.6		-		

Square damage was minimum at Coimbatore and ranged from three to eight per cent at Vaigaidam and Dharwad (Table 25).

**Table 25. Square damage (%)**

Entry	CBE		Vaigaidam	Dharwad	Mean
	O.V	T.V			
RCHB 708 Bt	0.7	3.6	5.8	3.02	3.2
DCH 32 (cc)	0.5	3.1	7.7	4.8	4.3



TCHB 213 (cc)	0.3	2.0	4.9	5.88	3.7
DHB 105 (cc)	0.5	2.7	7.1	6.25	4.6
CD at 5%	4.2		-		
CV %	112.4		-		

At harvest, open boll and locule damage were recorded. Due to very low incidence of bollworm at Coimbatore, the open boll and locule damage were also minimum. On the other hand, the open boll damage varied from 10.7 to 17.7 per cent at Vaigaidam and 29.15 to 45.71 per cent at Dharwad. RCHB 708 Bt recorded the lowest open boll and locule damage (Table 26 and 27).

**Table 26. Open boll damage at harvest (%) under protected condition**

Entry	CBE		Vaigaidam		Dharwad		Mean
	O.V	T.V	O.V	T.V	O.V	T.V	
RCHB 708 Bt	0.4	2.7	10.7	19.06	29.15	32.69	13.4
DCH 32 (cc)	1.2	4.5	16.3	23.81	34.67	36.09	17.4
TCHB 213 (cc)	1.0	4.4	13.0	21.14	42.00	40.42	18.7
DHB 105 (cc)	0.6	3.5	17.7	24.89	45.71	42.56	21.3
CD at 5%	4.14		0.78		7.00		
CV %	79.67		2.54		13.50		

**Table 27. Locule damage at harvest (%) under protected condition**

Entry	CBE		Vaigaidam		Dharwad		Mean
	O.V	T.V	O.V	T.V	O.V	T.V	
RCHB 708 Bt	0.4	2.7	8.5	16.99	6.69	15.00	5.2
DCH 32 (cc)	0.4	2.7	21.9	27.92	7.15	15.52	9.8
TCHB 213 (cc)	0.4	2.7	11.3	19.62	7.05	15.41	6.2
DHB 105 (cc)	0.8	4.0	23.1	28.71	7.10	15.46	10.3
CD at 5%	4.79		0.25		NS		
CV %	116.29		0.77		-		

## 2. EVALUATION UNDER UNPROTECTED CONDITIONS

The trial was repeated under unprotected conditions at all the three locations.

The open boll and locule damage were minimum at Coimbatore. Eventhough open boll damage at Vaigaidam and Dharwad ranged from 22 to 56 per cent, RCHB 708 Bt recorded the lowest open boll damage at both the locations. A similar trend was noticed for locule damage also (Table 28 and 29).

**Table 28. Open boll damage at harvest (%) under unprotected condition**

Entry	CBE		Vaigaidam		Dharwad		Mean
	O.V	T.V	O.V	T.V	O.V	T.V	
RCHB 708 Bt	0.0	1.3	22.2	28.08	31.97	34.45	18.0
DCH 32 (cc)	1.0	4.8	38.6	38.42	45.74	42.58	28.5
TCHB 213 (cc)	0.8	3.9	23.4	28.94	50.64	45.39	25.0
DHB 105 (cc)	0.6	3.5	39.4	38.86	56.30	48.65	32.1
CD at 5%	4.45		0.63		-		
CV %	95.40		1.36		-		

**Table 29. Locule damage at harvest (%) under unprotected condition**

Entry	CBE		Vaigaidam		Dharwad		Mean
	O.V	T.V	O.V	T.V	O.V	T.V	
RCHB 708 Bt	0.6	3.5	9.8	18.19	10.70	9.10	7.0
DCH 32 (cc)	0.2	2.2	27.9	31.88	12.15	20.41	13.4
TCHB 213 (cc)	0.8	3.9	12.0	20.22	12.69	20.88	8.5
DHB 105 (cc)	1.4	6.2	27.4	31.56	9.91	18.36	12.9
CD at 5%	4.30		1.32		3.17		
CV %	77.80		3.75		11.75		

**E. MEAN SEED COTTON YIELD UNDER UNPROTECTED CONDITIONS**

RCHB 708 Bt recorded the highest mean seed cotton yield of 1290 Kg/ha under unprotected condition and was significantly superior to all the other check hybrids (Table 30).

**Table 30. Seed cotton yield under unprotected condition (Kg/ha)**

Entry	CBE	Vaigaidam	Dharwad	Mean
RCHB 708 Bt	1363	1100	1407	1290
DCH 32 (cc)	750	791	884	808
TCHB 213 (cc)	1120	950	422	831
DHB 105 (cc)	745	683	756	728
CD at 5%	199.90	31.06	91.10	-
CV %	14.60	2.56	7.62	-

**F. PATHOLOGICAL EVALUATION**

The interspecific hybrid RCHB 708 Bt was found susceptible at Dharwad to all three foliar diseases *viz.*, Alternaria leaf spot, grey mildew and bacterial blight. However, at Coimbatore due to low disease pressure, this hybrid as well as the check hybrid had negligible or low disease incidence for Alternaria leaf spot and grey mildew (Table 31).

**Table 31. Disease incidences on Bt cotton**

Entry	Alternaria leaf spot			Grey mildew			BLB	
	CBE	Dharwad		CBE	Dharwad		Dharwad	
		O.V	T.V		O.V	T.V	O.V	T.V
RCHB 708 Bt	3.4	25.8	30.5	0.0	22.8	28.5	25.7	30.5
DCH 32 (cc)	2.4	26.3	30.9	0.0	26.5	31.0	28.7	32.4
TCHB 213 (cc)	1.9	27.5	31.6	0.0	26.8	31.2	28.7	32.4
DHB 105 (cc)	1.7	26.4	30.9	0.0	27.3	31.5	27.9	31.9
C.D. at 5%		NS			1.8		NS	
C.V.		7.0			4.4		4.7	

**G. OVERALL ASSESSMENT**

One interspecific hybrid RCHB 708 Bt was evaluated at three locations under both protected and unprotected conditions.

The test hybrid RCHB 708 Bt recorded the highest boll number and was on par with other hybrids in boll weight. With a mean ginning out turn of 31.6 per cent, it was on par with TCHB 213 but was inferior to DHB 105 and DCH 32.

All the hybrids evaluated were susceptible to sucking pests and required chemical intervention at frequent intervals. Square damage, open boll and locule damage were fairly high at Vaigaidam and Dharwad. However, the Bt hybrid RCHB 708 Bt recorded lesser incidence as compared to non-Bt check hybrids.

RCHB 708 Bt recorded the highest seed cotton yield under both protected (1771 Kg/ha) and unprotected (1290 Kg/ha) conditions and was significantly superior to the check hybrids under both protected (1141 to 1389 Kg/ha) and unprotected (728 to 808 Kg/ha) conditions. Fibre quality wise also RCHB 708 Bt was found to be superior to all the other check hybrids.

## **COMBINED REPORT OF TWO YEARS (2004-05 AND 2005-06)**

### **I. COMBINED REPORT OF INTRA HIRSUTUM HYBRIDS**

Under the All India Coordinated Cotton Improvement Project thirty seven Bt cotton hybrids were evaluated during 2004-05 season in South Zone. However, seeds of only twenty six hybrids were received from the respective seed companies for conducting the second year confirmatory trials.

The following are the twenty six Bt cotton hybrids evaluated for two consecutive years.

- xiii) RCH 111 Bt and RCH 371 Bt from RASI Seeds
- xiv) MRC 6100 Bt, MRC 7228 BG II and MRC 7351 BG II from MAHYCO Seeds
- xv) NCS 913 Bt from Nuziveedu Seeds
- xvi) JKCH 99 Bt, JKCH 10 Bt and JKCH 634 Bt from JK Seeds
- xvii) NCEH 2R Bt and NCEH 3R Bt from Nath Seeds
- xviii) Tulasi 4 Bt and Tulasi 117 Bt from Tulasi Seeds
- xix) NPH 2270 Bt and NPH 2171 Bt from Prabhat Seeds
- xx) Brahma Bt and Dhanwan Bt from Emergent Genetics
- xxi) GK 207 Bt and GK 209 Bt from Ganga Kaveri Seeds
- xxii) ACH 33-1 Bt, ACH 11-1 Bt and ACH 21-1 Bt from Ajeet Seeds
- xxiii) KDCHH 9632 Bt and KDCHH 441 BG II from Krishidhan Seeds and
- xxiv) PRCH 102 Bt and PRCH 103 Bt from Pravardhan Seeds

Bunny (the non-Bt check) and RCH 2 Bt (the Bt check) are the two check hybrids used in the trial. The results of the two year evaluation have been compiled and presented herewith.

### **A. BIOMETRICAL EVALUATION**

Eventhough the crop growth conditions were satisfactory in both the years, 2005-06 season with good distributed rainfall was more favourable for crop growth.

Mean boll weight was more during the second year. Hybrids MRC 7228 BG II, MRC 7351 BG II and KDCHH 441 BG II recorded a mean boll weight of 5.0 g and above. Mean boll weight of most of the other hybrids ranged from 4.3 to 4.8 g. The check hybrids recorded 4.5 g (Table 1).

Ginning out turn was consistent through the years. Mean ginning out turn of the check hybrids ranged from 34.5 to 35.0 per cent. NCS 913 Bt (37 %), JKCH 10 Bt (37.5%) and JKCH 634 Bt (38.4%) recorded higher ginning out turn (Table 1).

**Table 1. Boll weight (g) and Ginning percentage**

Entry	Boll weight (g)			Ginning (%)		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCH 111 Bt	4.2	4.6	4.4	35.2	34.8	35.0
RCH 371 Bt	4.4	4.5	4.5	37.3	35.9	36.6
MRC 6100 Bt	4.7	5.0	4.9	33.5	35.8	34.7
MRC 7228 BG II	5.1	5.4	5.2	34.1	32.2	33.2
MRC 7351 BG II	5.4	5.5	5.5	34.8	34.4	34.6
NCS 913 Bt	3.4	5.0	4.2	36.9	37.1	37.0
JKCH 99 Bt	4.3	4.5	4.4	35.5	35.5	35.5
JKCH 10 Bt	4.3	4.6	4.4	38.2	36.8	37.5
JKCH 634 Bt	4.0	4.5	4.3	37.4	39.5	38.4
NCEH 2R Bt	4.5	4.9	4.7	36.5	36.8	36.7
NCEH 3R Bt	4.3	4.6	4.5	34.9	35.6	35.3
TULASI 4 Bt	4.2	4.5	4.4	35.1	35.3	35.2
TULASI 117 Bt	3.7	4.5	4.1	35.7	34.6	35.1
NPH 2270 Bt	4.0	4.5	4.3	34.5	34.5	34.5
NPH 2171 Bt	4.0	4.4	4.2	36.3	35.7	36.0
BRAHMA Bt	4.7	5.2	4.9	34.5	33.9	34.2
DHANWAN Bt	4.6	5.0	4.8	34.8	34.0	34.4
GK 207 Bt	4.1	4.9	4.5	34.2	35.0	34.6
GK 209 Bt	4.1	4.5	4.3	36.1	35.6	35.9
ACH 33-1 Bt	4.1	4.5	4.3	34.5	35.4	34.9
ACH 11-1 Bt	4.1	4.5	4.3	36.2	34.2	35.2
ACH 21-1 Bt	4.8	4.9	4.9	35.0	34.7	34.8
KDCHH 9632 Bt	4.2	4.8	4.5	35.5	36.2	35.8
KDCHH.441 BG II	4.5	5.4	5.0	34.9	35.9	35.4
PRCH 102 Bt	4.5	4.9	4.7	36.4	36.3	36.3
PRCH 103 Bt	4.1	4.8	4.4	35.4	33.5	34.5
BUNNY (Check)	4.4	4.8	4.6	35.3	34.6	34.9
RCH 2 Bt (Check)	4.4	4.7	4.5	35.2	34.0	34.6

## B. MEAN SEED COTTON YIELD UNDER PROTECTED CONDITIONS

Twenty six hybrids were evaluated with two checks at Coimbatore and Siruguppa under irrigated conditions and under rainfed situations at Guntur, Nandyal and Dharwad.

**(i). Irrigated trials**

Among the check hybrids RCH 2 Bt (2072 Kg/ha) recorded the highest seed cotton yield. As many as twenty one hybrids recorded higher seed cotton yield. The increase in seed cotton yield ranging from 2 to 52 per cent. They are MRC 7351 BG II (3144 Kg/ha; 52% increase), MRC 6100 Bt (2940 Kg/ha; 42% increase), MRC 7228 BG II (2936 Kg/ha; 42% increase), RCH 371 Bt (2566 Kg/ha; 24% increase), GK 207 Bt (2420 Kg/ha; 17% increase), ACH 33-1 Bt (2418 Kg/ha; 17% increase), ACH 21-1 Bt (2417 Kg/ha; 17% increase), Dhanwan Bt (2406 Kg/ha; 16% increase), GK 209 Bt (2396 Kg/ha; 16% increase), Brahma Bt (2393 Kg/ha; 16% increase), NCS 913 Bt (2321 Kg/ha; 12% increase), Tulasi 117 Bt (2308 Kg/ha; 11% increase), Tulasi 4 Bt (2306 Kg/ha; 11% increase), PRCH 103 Bt (2303 Kg/ha; 11% increase), NCEH 3R Bt (2285 Kg/ha; 10% increase), KDCHH 9632 Bt (2201 Kg/ha; 6% increase), ACH 11-1 Bt (2171 Kg/ha; 5% increase), JKCH 10 Bt (2138 Kg/ha; 3% increase), PRCH 102 Bt (2133 Kg/ha; 3% increase), NPH 2270 Bt (2132 Kg/ha; 3% increase) and NCEH 2R Bt (2111 Kg/ha; 2% increase) (Table 2).

**(ii). Rainfed trials**

Under rainfed conditions RCH 2 Bt recorded the highest yield among the check hybrids. Nine hybrids recorded higher yield over RCH 2 Bt. The yield increase, however, ranged from 4 to 18 per cent only. They are, Brahma Bt (2200 Kg/ha; 18% increase), MRC 7228 BG II (2155 Kg/ha; 15% increase), RCH 371 Bt (2094 Kg/ha; 12% increase), RCH 111 Bt (2089 Kg/ha; 12% increase), MRC 7351 BG II (2043 Kg/ha; 9% increase), MRC 6100 Bt (1991 Kg/ha; 6% increase), NCEH 3R Bt (1978 Kg/ha; 6% increase), JKCH 99 Bt (1968 Kg/ha; 5% increase) and NCS 913 Bt (1947 Kg/ha; 4% increase) (Table 2).

**Table 2. Mean seed cotton yield (Kg/ha) under protected condition**

Entry	Irrigated			Rainfed		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCH 111 Bt	1596	2226	1911	2119	2059	2089
RCH 371 Bt	2462	2670	2566	1892	2296	2094
MRC 6100 Bt	2832	3048	2940	1755	2228	1991
MRC 7228 BG II	3378	2494	2936	2143	2166	2155
MRC 7351 BG II	3763	2525	3144	1978	2108	2043
NCS 913 Bt	2121	2521	2321	1556	2338	1947
JKCH 99 Bt	1741	2147	1944	1971	1965	1968
JKCH 10 Bt	1907	2369	2138	1438	1698	1568
JKCH 634 Bt	1540	2200	1870	1292	1261	1277

NCEH 2R Bt	2059	2164	2111	1909	1486	1697
NCEH 3R Bt	2278	2292	2285	1774	2183	1978
TULASI 4 Bt	1990	2623	2306	1332	2156	1744
TULASI 117 Bt	1955	2662	2308	777	2054	1415
NPH 2270 Bt	1874	2390	2132	1261	1778	1519
NPH 2171 Bt	1176	2136	1656	1241	1509	1375
BRAHMA Bt	2036	2751	2393	2151	2250	2200
DHANWAN Bt	2065	2747	2406	1288	2074	1681
GK 207 Bt	2191	2650	2420	1379	1942	1661
GK 209 Bt	2223	2569	2396	1802	1859	1831
ACH 33-1 Bt	2277	2559	2418	1771	1931	1851
ACH 11-1 Bt	2149	2192	2171	1437	1821	1629
ACH 21-1 Bt	2410	2424	2417	1710	1729	1720
KDCHH 9632 Bt	1988	2415	2201	1636	1780	1708
KDCHH.441 BG II	1520	1995	1757	1470	1540	1505
PRCH 102 Bt	1944	2323	2133	1310	1933	1622
PRCH 103 Bt	2047	2558	2303	1565	2023	1794
BUNNY (Check)	1578	1861	1719	1174	1406	1290
RCH 2 Bt (Check)	1913	2230	2072	1689	2050	1870

### C. FIBRE QUALITY EVALUATION

Mean fibre length (2.5% span length) varied from 26.4 mm to 32.3 mm. The Bt check hybrid RCH 2 Bt recorded a fibre length of 30.9 mm. MRC 7351 BG II (30.5 mm), NCEH 2R Bt (31.5 mm), Brahma Bt (32.3 mm), GK 207 Bt (31.3 mm) were superior to the check hybrids. PRCH 103 Bt recorded the lowest micronaire (3.6), followed by Tulasi 117 Bt and GK 209 Bt (3.8). The micronaire of the rest of the hybrids ranged from 3.9 to 5.0 (Table 3). Uniformity ratio of NCEH 2R Bt was 43 per cent. The rest of the hybrids recorded mean uniformity ratio ranging from 47 to 52 per cent. The fibre strength in these hybrids varied from 20.0 to 22.9 g/tex (Table 4).

**Table 3. 2.5% Span length (mm) and Micronaire**

Entry	2.5% Span length (mm)			Micronaire		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCH 111 Bt	30.8	29.9	30.4	3.8	4.2	4.0
RCH 371 Bt	28.3	29.1	28.7	4.1	4.6	4.4
MRC 6100 Bt	29.3	28.4	28.9	4.0	4.7	4.4
MRC 7228 BG II	28.0	28.1	28.0	4.2	5.0	4.6
MRC 7351 BG II	30.6	30.3	30.5	4.1	4.8	4.5
NCS 913 Bt	27.4	29.5	28.5	4.0	4.4	4.2
JKCH 99 Bt	25.8	27.9	26.9	4.9	5.2	5.0
JKCH 10 Bt	27.6	29.3	28.5	4.1	4.3	4.2

JKCH 634 Bt	28.4	25.8	27.1	3.9	4.7	4.3
NCEH 2R Bt	32.4	30.5	31.5	3.8	4.1	4.0
NCEH 3R Bt	30.8	30.6	30.7	3.8	4.3	4.0
TULASI 4 Bt	25.2	29.2	27.2	3.9	4.1	4.0
TULASI 117 Bt	27.3	29.6	28.4	3.6	4.0	3.8
NPH 2270 Bt	27.9	28.5	28.2	4.0	4.3	4.1
NPH 2171 Bt	27.1	29.0	28.1	4.0	4.3	4.1
BRAHMA Bt	31.9	32.6	32.3	3.9	3.9	3.9
DHANWAN Bt	26.5	30.8	28.7	4.1	4.1	4.1
GK 207 Bt	30.9	31.7	31.3	3.6	3.9	3.8
GK 209 Bt	28.2	30.1	29.2	3.7	4.0	3.8
ACH 33-1 Bt	27.5	29.1	28.3	4.0	4.4	4.2
ACH 11-1 Bt	26.5	26.2	26.4	4.0	4.5	4.3
ACH 21-1 Bt	29.1	29.9	29.5	3.9	4.1	4.0
KDCHH 9632 Bt	29.3	28.3	28.8	4.2	4.3	4.2
KDCHH.441 BG II	28.4	27.3	27.9	3.5	4.6	4.1
PRCH 102 Bt	30.0	28.8	29.4	4.5	5.4	5.0
PRCH 103 Bt	27.8	28.0	27.9	3.5	3.7	3.6
BUNNY (Check)	30.9	29.4	30.2	4.1	4.1	4.1
RCH 2 Bt (Check)	31.9	29.9	30.9	3.8	4.7	4.2

**Table 4. Fibre strength (g/tex)**

Entry	Uniformity ratio (%)			Fibre strength (g/tex)		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCH 111 Bt	49	48	48	21.2	23.0	22.1
RCH 371 Bt	50	49	49	21.2	21.1	21.2
MRC 6100 Bt	46	48	47	19.8	20.2	20.0
MRC 7228 BG II	52	50	51	21.3	22.4	21.8
MRC 7351 BG II	49	49	49	21.0	21.5	21.3
NCS 913 Bt	47	46	47	20.3	22.2	21.3
JKCH 99 Bt	51	49	50	19.6	21.7	20.7
JKCH 10 Bt	50	48	49	20.3	22.7	21.5
JKCH 634 Bt	50	52	51	22.4	21.6	22.0
NCEH 2R Bt	51	50	51	22.7	23.0	22.9
NCEH 3R Bt	46	47	47	20.6	21.8	21.2
TULASI 4 Bt	49	46	47	19.7	23.0	21.4
TULASI 117 Bt	48	46	47	19.9	22.1	21.0
NPH 2270 Bt	49	51	50	21.6	22.6	22.1
NPH 2171 Bt	49	50	50	21.3	22.8	22.0
BRAHMA Bt	49	47	48	21.7	23.4	22.6
DHANWAN Bt	48	49	49	20.5	23.2	21.8
GK 207 Bt	49	49	49	21.8	23.5	22.6
GK 209 Bt	48	48	48	21.5	24.2	22.9



ACH 33-1 Bt	49	50	49	20.5	22.5	21.5
ACH 11-1 Bt	53	51	52	21.6	22.0	21.8
ACH 21-1 Bt	49	47	48	21.5	22.8	22.2
KDCHH 9632 Bt	50	50	50	20.3	20.8	20.6
KDCHH.441 BG II	49	50	49	20.9	21.5	21.2
PRCH 102 Bt	49	51	50	21.7	22.8	22.2
PRCH 103 Bt	50	49	49	21.5	23.4	22.5
BUNNY (Check)	47	47	47	21.3	23.1	22.2
RCH 2 Bt (Check)	47	48	48	20.0	22.4	21.2

The overall fibre quality was good and on par with the released check hybrid RCH 2 Bt (Table 5).

**Table 5. Overall fibre properties**

Entry	2.5% Span length (mm)	Uniformity ratio (%)	Micronaire	Strength (g/tex)
RCH 111 Bt	30.4	48	4.0	22.1
RCH 371 Bt	28.7	49	4.4	21.2
MRC 6100 Bt	28.9	47	4.4	20.0
MRC 7228 BG II	28.0	51	4.6	21.8
MRC 7351 BG II	30.5	49	4.5	21.3
NCS 913 Bt	28.5	47	4.2	21.3
JKCH 99 Bt	26.9	50	5.0	20.7
JKCH 10 Bt	28.5	49	4.2	21.5
JKCH 634 Bt	27.1	51	4.3	22.0
NCEH 2R Bt	31.5	51	4.0	22.9
NCEH 3R Bt	30.7	47	4.0	21.2
TULASI 4 Bt	27.2	47	4.0	21.4
TULASI 117 Bt	28.4	47	3.8	21.0
NPH 2270 Bt	28.2	50	4.1	22.1
NPH 2171 Bt	28.1	50	4.1	22.0
BRAHMA Bt	32.3	48	3.9	22.6
DHANWAN Bt	28.7	49	4.1	21.8
GK 207 Bt	31.3	49	3.8	22.6
GK 209 Bt	29.2	48	3.8	22.9
ACH 33-1 Bt	28.3	49	4.2	21.5
ACH 11-1 Bt	26.4	52	4.3	21.8
ACH 21-1 Bt	29.5	48	4.0	22.2
KDCHH 9632 Bt	28.8	50	4.2	20.6
KDCHH.441 BG II	27.9	49	4.1	21.2
PRCH 102 Bt	29.4	50	5.0	22.2
PRCH 103 Bt	27.9	49	3.6	22.5
BUNNY (Check)	30.2	47	4.1	22.2
RCH 2 Bt (Check)	30.9	48	4.2	21.2

## D. ENTOMOLOGICAL EVALUATION

### 1. EVALUATION UNDER PROTECTED CONDITIONS

#### Sucking pests

Jassids, thrips and aphids were the main sucking pests. All the hybrids evaluated harboured these pests at varying intensities at different times and exhibited susceptible reaction at varying grades. Chemical intervention was required at varying intervals to control the sucking pests (Table 6 and 7).

**Table 6. Jassid and thrips population**

Entry	Jassids/ Plant			Thrips/ Plant		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCH 111 Bt	4.8	2.8	3.8	13.0	16.2	14.6
RCH 371 Bt	3.2	2.5	2.9	20.2	24.2	22.2
MRC 6100 Bt	3.6	2.7	3.2	17.4	22.8	20.1
MRC 7228 BG II	2.9	2.5	2.7	25.6	25.3	25.5
MRC 7351 BG II	3.4	2.8	3.1	20.2	21.5	20.9
NCS 913 Bt	5.0	2.9	4.0	8.4	16.3	12.4
JKCH 99 Bt	3.5	3.2	3.3	9.2	13.3	11.2
JKCH 10 Bt	3.6	2.4	3.0	14.6	19.5	17.1
JKCH 634 Bt	4.7	2.9	3.8	13.7	20.7	17.2
NCEH 2R Bt	3.3	2.0	2.6	10.0	19.9	14.9
NCEH 3R Bt	2.4	2.4	2.4	17.6	15.9	16.7
TULASI 4 Bt	4.1	2.8	3.5	15.6	16.3	15.9
TULASI 117 Bt	4.3	2.8	3.5	8.4	14.0	11.2
NPH 2270 Bt	3.6	3.5	3.5	8.6	17.1	12.8
NPH 2171 Bt	3.9	3.1	3.5	11.7	20.1	15.9
BRAHMA Bt	4.8	3.1	4.0	12.6	16.5	14.6
DHANWAN Bt	5.2	2.8	4.0	14.9	22.7	18.8
GK 207 Bt	2.5	2.6	2.5	14.7	23.0	18.8
GK 209 Bt	2.7	3.0	2.9	14.5	21.6	18.1
ACH 33-1 Bt	3.8	2.9	3.3	14.0	22.4	18.2
ACH 11-1 Bt	4.5	2.7	3.6	22.1	20.8	21.4
ACH 21-1 Bt	4.1	2.5	3.3	13.1	19.6	16.3
KDCHH 9632 Bt	3.9	3.0	3.5	10.9	20.9	15.9
KDCHH.441 BG II	3.5	3.2	3.4	6.8	21.1	13.9
PRCH 102 Bt	3.7	3.6	3.7	12.5	20.0	16.2
PRCH 103 Bt	3.9	3.2	3.5	14.6	23.5	19.0
BUNNY (Check)	4.0	2.7	3.3	14.2	15.5	14.9
RCH 2 Bt (Check)	3.8	3.4	3.6	9.9	13.9	11.9

**Table 7. Whitefly population/ Plant**

Entry	2004-05	2005-06	Mean
RCH 111 Bt	2.1	1.5	1.8
RCH 371 Bt	3.7	1.5	2.6
MRC 6100 Bt	3.6	3.2	3.4
MRC 7228 BG II	3.3	2.4	2.9
MRC 7351 BG II	4.8	2.7	3.7
NCS 913 Bt	2.9	1.7	2.3
JKCH 99 Bt	2.1	1.9	2.0
JKCH 10 Bt	2.1	1.7	1.9
JKCH 634 Bt	3.4	1.8	2.6
NCEH 2R Bt	2.9	1.7	2.3
NCEH 3R Bt	3.6	1.9	2.7
TULASI 4 Bt	5.0	2.4	3.7
TULASI 117 Bt	2.6	2.1	2.3
NPH 2270 Bt	3.0	1.8	2.4
NPH 2171 Bt	2.7	2.2	2.4
BRAHMA Bt	3.4	1.9	2.6
DHANWAN Bt	3.4	1.9	2.6
GK 207 Bt	4.2	2.8	3.5
GK 209 Bt	4.0	2.4	3.2
ACH 33-1 Bt	4.3	2.5	3.4
ACH 11-1 Bt	4.7	2.1	3.4
ACH 21-1 Bt	4.1	2.2	3.2
KDCHH 9632 Bt	2.4	1.8	2.1
KDCHH.441 BG II	3.6	2.8	3.2
PRCH 102 Bt	3.0	2.3	2.6
PRCH 103 Bt	3.0	3.0	3.0
BUNNY (Check)	3.9	2.5	3.2
RCH 2 Bt (Check)	3.1	1.6	2.3

**Bollworms**

Open boll and locule damage at harvest were the highest in the non-Bt check hybrid Bunny. The Bt check hybrid RCH 2 Bt recorded a mean open boll damage of 12.1 per cent and locule damage of 9.5 per cent. Most of the hybrids evaluated were comparable to the Bt check hybrids in open boll and locule damage (Table 8).

**Table 8. Open boll damage and locule damage under protected conditions**

Entry	Open boll damage (%)			Locule damage (%)		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCH 111 Bt	2.7	14.0	8.4	6.1	6.0	6.0
RCH 371 Bt	5.5	13.7	9.6	7.7	6.9	7.3

MRC 6100 Bt	6.4	15.4	10.9	4.2	7.3	5.8
MRC 7228 BG II	8.0	15.1	11.6	7.7	6.1	6.9
MRC 7351 BG II	8.0	17.3	12.7	6.4	8.3	7.4
NCS 913 Bt	6.9	18.7	12.8	4.9	8.1	6.5
JKCH 99 Bt	3.9	15.2	9.5	5.7	8.8	7.2
JKCH 10 Bt	7.7	13.6	10.6	8.2	7.5	7.9
JKCH 634 Bt	8.0	17.1	12.5	6.2	8.8	7.5
NCEH 2R Bt	11.1	19.1	15.1	7.6	10.2	8.9
NCEH 3R Bt	5.2	17.6	11.4	5.2	10.2	7.7
TULASI 4 Bt	1.2	15.4	8.3	4.2	8.6	6.4
TULASI 117 Bt	6.8	16.0	11.4	6.9	9.6	8.3
NPH 2270 Bt	5.4	17.1	11.2	4.3	8.8	6.5
NPH 2171 Bt	7.7	13.2	10.5	5.8	8.4	7.1
BRAHMA Bt	4.6	17.9	11.3	6.0	9.7	7.8
DHANWAN Bt	5.7	19.4	12.6	6.6	9.1	7.9
GK 207 Bt	5.6	15.5	10.6	8.8	7.9	8.3
GK 209 Bt	5.3	12.3	8.8	10.5	6.6	8.6
ACH 33-1 Bt	5.9	15.1	10.5	13.3	8.2	10.8
ACH 11-1 Bt	8.1	15.5	11.8	8.5	6.2	7.3
ACH 21-1 Bt	8.1	12.4	10.2	7.3	6.0	6.6
KDCHH 9632 Bt	4.7	15.2	10.0	6.1	8.4	7.2
KDCHH.441 BG II	8.8	13.2	11.0	7.6	9.8	8.7
PRCH 102 Bt	6.8	13.5	10.1	5.8	9.1	7.5
PRCH 103 Bt	4.7	15.0	9.9	8.1	6.5	7.3
BUNNY (Check)	5.7	20.7	13.2	15.7	16.0	15.9
RCH 2 Bt (Check)	10.2	14.0	12.1	9.4	9.5	9.5

### Plant protection

Two to three rounds of sprayings were required to control the sucking pests. On the other hand, for bollworms, one to two rounds of chemical application was required in the case of most of the hybrids. GK 209 Bt and ACH 11-1 Bt required more than two rounds of sprayings to control the bollworms. Due to low incidence of bollworms, even the control hybrids required only one to two rounds of chemical intervention (Table 9).

**Table 9. Spray schedule under protected conditions**

Entry	Sucking pests			Bollworms		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCH 111 Bt	2.50	2.50	2.50	1.33	1.20	1.27
RCH 371 Bt	2.00	2.25	2.13	1.67	1.20	1.43
MRC 6100 Bt	2.00	2.50	2.25	1.67	1.20	1.43
MRC 7228 BG II	2.30	2.50	2.40	1.67	1.20	1.43
MRC 7351 BG II	2.30	2.50	2.40	1.67	1.00	1.33

NCS 913 Bt	2.30	2.25	2.28	1.33	1.20	1.27
JKCH 99 Bt	2.00	2.75	2.38	1.67	1.40	1.53
JKCH 10	2.00	2.25	2.13	1.33	1.20	1.27
JKCH 634	2.00	2.50	2.25	1.67	1.20	1.43
NCEH 2R Bt	2.30	2.67	2.48	1.33	1.20	1.27
NCEH 3R Bt	2.00	2.00	2.00	2.00	1.40	1.70
TULASI 4 Bt	2.00	2.00	2.00	2.00	1.20	1.60
TULASI 117 Bt	2.00	2.50	2.25	1.00	1.00	1.00
NPH 2270 Bt	2.30	2.25	2.28	1.67	1.40	1.53
NPH 2171 Bt	2.30	2.50	2.40	2.33	1.40	1.87
BRAHMA Bt	2.00	2.25	2.13	2.33	1.20	1.77
DHANWAN Bt	2.50	2.25	2.38	1.67	1.40	1.53
GK 207 Bt	2.00	2.50	2.25	2.00	1.20	1.60
GK 209 Bt	2.30	2.50	2.40	3.00	1.60	2.30
ACH 33-1 Bt	2.00	2.25	2.13	1.33	1.40	1.37
ACH 11-1 Bt	2.30	2.25	2.28	3.33	1.60	2.47
ACH 21-1 Bt	2.00	2.00	2.00	1.67	1.20	1.43
KDCHH 9632 Bt	2.00	2.00	2.00	2.00	1.40	1.70
KDCHH.441 BG II	2.50	2.50	2.50	1.67	1.20	1.43
PRCH 102 Bt	2.00	2.00	2.00	1.33	1.40	1.37
PRCH 103 Bt	2.00	2.50	2.25	1.67	1.60	1.63
BUNNY (Check)	2.00	2.50	2.25	2.00	1.60	1.80
RCH 2 Bt (Check)	2.30	2.50	2.40	1.00	1.40	1.20

## 2. EVALUATION UNDER UNPROTECTED CONDITIONS

Under unprotected conditions, the non-Bt check hybrid, recorded a mean open boll damage of 27.2 per cent and locule damage of 20.4 per cent. The Bt check hybrid RCH 2 Bt recorded a open boll damage of 16.9 per cent and locule damage of 9.9 per cent. The test hybrids were also on par with the Bt check hybrids and superior to non-Bt check hybrid in open boll and locule damage (Table 10).

**Table 10. Open boll damage and locule damage under unprotected conditions**

Entry	Open boll damage (%)			Locule damage (%)		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCH 111 Bt	19.4	17.2	18.3	12.2	7.2	9.7
RCH 371 Bt	17.1	16.0	16.6	8.9	8.3	8.6
MRC 6100 Bt	14.9	17.5	16.2	11.3	8.2	9.8
MRC 7228 BG II	11.8	15.7	13.8	7.7	7.0	7.3
MRC 7351 BG II	15.0	18.4	16.7	8.6	9.2	8.9
NCS 913 Bt	15.3	18.4	16.8	8.1	10.6	9.4
JKCH 99 Bt	17.5	17.9	17.7	11.5	9.7	10.6
JKCH 10 Bt	13.2	16.6	14.9	7.4	8.4	7.9

JKCH 634 Bt	16.1	19.6	17.9	9.2	9.7	9.4
NCEH 2R Bt	15.5	20.9	18.2	9.0	12.3	10.7
NCEH 3R Bt	16.7	20.2	18.4	9.7	11.5	10.6
TULASI 4 Bt	15.2	20.0	17.6	8.3	9.2	8.7
TULASI 117 Bt	16.9	18.7	17.8	10.7	10.6	10.6
NPH 2270 Bt	18.6	16.9	17.8	8.2	9.4	8.8
NPH 2171 Bt	20.0	16.3	18.2	9.8	13.1	11.5
BRAHMA Bt	15.0	20.2	17.6	10.8	12.2	11.5
DHANWAN Bt	15.1	16.9	16.0	9.0	13.0	11.0
GK 207 Bt	17.3	17.6	17.4	9.1	8.6	8.9
GK 209 Bt	14.9	15.0	14.9	6.7	6.8	6.7
ACH 33-1 Bt	19.4	17.7	18.5	10.6	9.8	10.2
ACH 11-1 Bt	20.5	14.7	17.6	10.0	7.2	8.6
ACH 21-1 Bt	21.4	17.0	19.2	14.7	7.7	11.2
KDCHH 9632 Bt	14.2	16.5	15.4	10.8	8.2	9.5
KDCHH.441 BG II	18.5	19.2	18.8	12.1	11.2	11.6
PRCH 102 Bt	19.4	16.8	18.1	8.7	10.2	9.4
PRCH 103 Bt	16.7	14.5	15.6	8.6	7.5	8.0
BUNNY (Check)	26.7	27.7	27.2	24.3	16.5	20.4
RCH 2 Bt (Check)	13.8	20.1	16.9	8.9	10.9	9.9

## E. MEAN SEED COTTON YIELD UNDER UNPROTECTED CONDITIONS

### (i). Irrigated trials

Under irrigated conditions, the Bt check hybrid RCH 2 Bt recorded a mean seed cotton yield of 1820 Kg/ha. As many as fifteen test hybrids recorded higher seed cotton yield than RCH 2 Bt. The yield increase ranged from 1 to 37 per cent. They are MRC 7351 BG II (2496 Kg/ha; 37% increase), MRC 7228 BG II (2442 Kg/ha; 34% increase), MRC 6100 Bt (2424 Kg/ha; 33% increase), Brahma Bt (2180 Kg/ha; 20% increase), NCS 913 Bt (2143 Kg/ha; 18% increase), Dhanwan Bt (2001 Kg/ha; 10% increase), Tulasi 4 Bt (1943 Kg/ha; 7% increase), Tulasi 117 Bt (1934 Kg/ha; 6% increase), ACH 33-1 Bt (1927 Kg/ha; 6% increase), GK 209 Bt (1913 Kg/ha; 5% increase), ACH 21-1 Bt (1896 Kg/ha; 4% increase), RCH 371 Bt (1887 Kg/ha; 4% increase), NCEH 3R Bt (1870 Kg/ha; 3% increase), GK 207 Bt (1868 Kg/ha; 3% increase) and NCEH 2R Bt (1838 Kg/ha; 1% increase) (Table 11).

### (ii). Rainfed trials

Under rainfed conditions, as many as 21 hybrids recorded better yield than the best check RCH 2 Bt (1327 Kg/ha). The yield increases ranged from 2 to 51 per cent. They are MRC 6100 Bt (2002 Kg/ha; 51% increase), MRC 7228 BG II (1998 Kg/ha; 50% increase), MRC 7351 BG II (1955 Kg/ha; 47% increase), Brahma Bt (1838 Kg/ha; 38%

increase), RCH 371 Bt (1803 Kg/ha; 36% increase), NCEH 3R Bt (1648 Kg/ha; 24% increase), JKCH 99 Bt (1637 Kg/ha; 23% increase), RCH 111 Bt (1607 Kg/ha; 21% increase), Dhanwan Bt (1591 Kg/ha; 20% increase), KDCHH 441 BG II (1563 Kg/ha; 18% increase), NCS 913 Bt (1561 Kg/ha; 18% increase), GK 209 Bt (1547 Kg/ha; 17% increase), ACH 21-1 Bt (1533 Kg/ha; 16% increase), ACH 11-1 Bt (1466 Kg/ha; 10% increase), Tulasi 4 Bt (1454 Kg/ha; 10% increase), ACH 33-1 Bt (1439 Kg/ha; 8% increase), NCEH 2R Bt (1429 Kg/ha; 8% increase), Tulasi 117 Bt (1393 Kg/ha; 5% increase), NPH 2171 Bt (1374 Kg/ha; 4% increase), GK 207 Bt (1372 Kg/ha; 3% increase) and JKCH 10 Bt (1349 Kg/ha; 2% increase) (Table 11).

**Table 11. Mean seed cotton yield (Kg/ha) under unprotected condition**

Entry	Irrigated			Rainfed		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCH 111 Bt	936	1867	1402	1387	1828	1607
RCH 371 Bt	1232	2542	1887	1680	1925	1803
MRC 6100 Bt	2207	2642	2424	1942	2062	2002
MRC 7228 BG II	2573	2311	2442	2272	1696	1984
MRC 7351 BG II	2551	2441	2496	2247	1663	1955
NCS 913 Bt	2076	2209	2143	1285	1836	1561
JKCH 99 Bt	776	1960	1368	1388	1885	1637
JKCH 10 Bt	1026	1893	1459	1196	1503	1349
JKCH 634 Bt	1295	1952	1623	1093	1312	1203
NCEH 2R Bt	1643	2033	1838	1544	1314	1429
NCEH 3R Bt	1513	2228	1870	1347	1950	1648
TULASI 4 Bt	1457	2430	1943	1038	1870	1454
TULASI 117 Bt	1473	2394	1934	1002	1784	1393
NPH 2270 Bt	985	1881	1433	1095	1402	1249
NPH 2171 Bt	1078	1804	1441	1089	1659	1374
BRAHMA Bt	1934	2426	2180	1910	1765	1838
DHANWAN Bt	1569	2432	2001	1392	1789	1591
GK 207 Bt	1387	2349	1868	1413	1332	1372
GK 209 Bt	1602	2223	1913	1187	1906	1547
ACH 33-1 Bt	1477	2378	1927	1173	1704	1439
ACH 11-1 Bt	1015	1865	1440	1124	1808	1466
ACH 21-1 Bt	1603	2189	1896	1189	1878	1533
KDCHH 9632 Bt	1301	2127	1714	943	1694	1318
KDCHH.441 BG II	1313	1646	1479	1711	1416	1563
PRCH 102 Bt	1078	2171	1624	950	1526	1238
PRCH 103 Bt	1179	2205	1692	1305	1337	1321
BUNNY (Check)	1248	1587	1417	819	1145	982
RCH 2 Bt (Check)	1596	2044	1820	1226	1428	1327

## F. PATHOLOGICAL EVALUTION

### Alternaria leaf spot

At high disease pressure, all the test entries and also the check hybrids (Bunny and RCH 2 Bt) were found susceptible to Alternaria leaf spot at Guntur, Dharwad and Siruguppa in both the years. At Coimbatore, where there was low incidence of the disease the test entries *viz.*, JKCH 99 Bt, JKCH 634 Bt, NCEH 2R, NPH 2171 Bt, Brahma Bt, GK 207 Bt and KDCHH 9632 Bt were either free from the disease or had very low incidence (1.6 to 3.3 PDI) (Table 12).

**Table 12. Alternaria leaf spot**

Entries	2004-05 (PDI)				2005-06			
	CBE	Guntur	Dharwad*	Siruguppa*	CBE	Guntur	Dharwad	Siruguppa
RCH 111 Bt	25.0	19.3	4	4	4.3	17.3	26.9	11.7
RCH 371 Bt	10.0	20.7	4	4	4.6	21.1	28.8	26.1
MRC6100 Bt	8.8	18.7	4	4	2.4	28.7	26.8	46.7
MRC 7228BGII	13.8	20.3	4	4	3.6	20.3	22.3	30.1
MRC 7351 BGII	16.3	18.0	4	4	2.3	21.0	25.6	27.5
NCS 913 Bt	21.3	19.3	4	4	2.9	25.3	25.9	33.8
JKCH 99 Bt	0.0	18.7	4	4	1.7	25.5	24.8	31.9
JKCH 10 Bt	13.8	19.3	4	4	2.4	29.0	25.9	33.3
JKCH 634 Bt	0.0	17.0	4	4	3.3	30.7	25.1	32.8
NCEH 2R Bt	0.0	25.7	4	4	2.4	25.3	26.5	29.0
NCEH 3R BT	20.0	32.3	4	4	2.6	18.5	23.7	26.6
Tulasi 4 Bt	11.3	23.3	3	4	3.1	22.3	25.4	31.1
Tulasi 117 Bt	6.3	20.7	4	4	3.3	26.6	23.4	31.9
NPH 2270 Bt	13.8	21.3	4	4	2.6	21.3	23.5	29.6
NPH 2171 Bt	0.0	27.0	4	4	1.7	19.8	25.6	29.6
Brahma Bt	0.0	18.0	4	4	1.6	19.7	23.6	31.0
Dhanwan Bt	13.8	24.7	4	4	1.4	19.8	23.5	28.1
GK 207 Bt	0.0	21.3	4	4	2.4	23.3	25.6	24.9
GK 209 Bt	6.3	18.7	4	4	2.3	17.5	24.9	27.2
ACH 33-1Bt	21.3	28.3	4	4	2.4	21.0	23.3	27.6
ACH 11-1Bt	8.8	30.7	4	4	1.4	13.7	19.6	24.9
ACH 21-1Bt	18.8	27.0	4	4	1.4	16.6	20.2	24.2
KDCHH 9632 Bt	0.0	20.0	4	4	2.7	25.8	25.0	25.7
KDCHH 441 BG II	23.0	18.0	4	4	3.1	21.7	25.9	23.1
PRCH 102 Bt	26.3	21.3	4	4	2.9	16.7	24.9	28.9
PRCH 103 Bt	15.0	19.3	4	4	3.3	23.3	24.0	29.7
Bunny (Check)	0.0	25.3	4	4	2.3	27.7	23.8	33.5
RCH 2Bt (Check)	22.5	25.3	4	4	2.4	28.4	24.6	27.9

\*Grades

### Bacterial leaf blight



All the test entries have been found susceptible to bacterial blight at Dharwad and Siruguppa during the two years of test (Table 13).

**Table 13. Bacterial leaf blight**

Entries	2004-05*		2005-06 (PDI)	
	Dharwad	Siruguppa	Dharwad	Siruguppa
RCH 111 Bt	4	3	29.4	8.6
RCH 371 Bt	4	1	27.0	14.3
MRC6100 Bt	4	1	31.7	11.9
MRC 7228BGII	4	1	28.2	11.8
MRC 7351 BGII	4	1	28.7	15.8
NCS 913 Bt	4	2	27.0	13.5
JKCH 99 Bt	4	4	29.6	13.3
JKCH 10 Bt	4	2	27.9	11.5
JKCH 634 Bt	3	2	27.3	13.4
NCEH 2R Bt	3	3	27.1	10.8
NCEH 3R BT	3	2	29.0	11.5
Tulasi 4 Bt	3	3	27.0	10.5
Tulasi 117 Bt	3	3	27.4	14.8
NPH 2270 Bt	2	2	28.8	16.3
NPH 2171 Bt	3	2	30.2	13.2
Brahma Bt	4	2	27.8	12.0
Dhanwan Bt	3	2	28.3	12.1
GK 207 Bt	3	2	28.0	13.4
GK 209 Bt	4	3	26.6	13.2
ACH 33-1Bt	4	2	24.6	11.6
ACH 11-1Bt	3	1	27.4	12.9
ACH 21-1Bt	4	2	25.8	15.8
KDCHH 9632 Bt	4	3	26.9	12.6
KDCHH 441 BG II	4	1	30.5	11.7
PRCH 102 Bt	4	3	28.3	14.4
PRCH 103 Bt	4	3	29.1	13.8
Bunny (Check)	4	1	28.2	11.3
RCH 2Bt (Check)	4	2	29.4	10.4

\*Grades

### Grey mildew

Overall, the test entries have been found highly susceptible to grey mildew at Guntur, Dharwad and Siruguppa in both the years of test. However, at low disease pressure in Coimbatore the test entries *viz.*, MRC 7228 BG II, MRC 7351 BG II, NCS 913 Bt, JKCH 10 Bt, NCEH 2R Bt, NCEH 3R Bt, Tulasi 117 Bt, NPH 2171 Bt, GK 209 Bt, KDCHH 9632 Bt and PRCH 102 Bt were free from grey mildew disease during two years of test (Table 14).

**Table 14. Grey mildew**

Entries	2004-05				2005-06 (PDI)			
	CBE	Guntur	Dharwad*	Siruguppa*	CBE	Guntur	Dharwad	Siruguppa
RCH 111 Bt	8.75	29.33	3	4	10.0	15.3	30.7	35.2
RCH 371 Bt	7.5	21	3	4	12.5	17.3	26.3	36.7
MRC6100 Bt	17.5	19.33	4	4	0.0	19.7	24.8	37.3
MRC 7228BGII	0	27.83	4	4	0.0	21.7	24.1	36.0
MRC 7351 BGII	0	19.16	3	4	0.0	21.2	25.8	36.0
NCS 913 Bt	0	18.58	3	4	0.0	27.7	27.1	36.2
JKCH 99 Bt	0	24	4	4	16.4	19.5	24.6	35.3
JKCH 10 Bt	0	23.66	3	4	0.0	28.2	30.8	30.8
JKCH 634 Bt	13.75	27.5	4	4	0.0	21.7	25.4	34.0
NCEH 2R Bt	0	20.83	3	4	0.0	30.7	24.9	33.9
NCEH 3R BT	0	18.25	3	4	0.0	20.7	22.6	33.6
Tulasi 4 Bt	2.5	20.3	4	4	9.7	27.2	23.8	29.8
Tulasi 117 Bt	0	23.5	3	4	0.0	24.9	25.5	29.7
NPH 2270 Bt	3.75	18.83	4	4	0.0	24.5	23.7	40.4
NPH 2171 Bt	0	20.83	4	4	0.0	16.0	24.3	33.3
Brahma Bt	0	20.83	4	4	15.6	18.0	23.2	35.1
Dhanwan Bt	0	29.33	3	4	12.8	17.0	20.5	32.6
GK 207 Bt	0	27.66	3	4	0.0	22.4	22.8	35.4
GK 209 Bt	0	28.83	4	4	12.3	26.8	23.8	35.2
ACH 33-1Bt	17.5	20	4	4	9.7	17.2	22.8	36.0
ACH 11-1Bt	8.75	21.33	4	4	10.4	20.2	23.2	35.9
ACH 21-1Bt	5	27.25	3	4	10.6	18.3	26.0	33.7
KDCHH 9632 Bt	0	24	4	4	0.0	22.3	23.2	36.3
KDCHH 441 BG II	0	18.83	4	4	0.0	28.5	25.0	32.9
PRCH 102 Bt	0	26.83	4	4	0.0	18.3	23.6	31.1
PRCH 103 Bt	2.5	16.33	4	4	0.0	17.8	25.4	23.5
Bunny (Check)	0	23.16	4	4	0.0	20.0	24.6	33.3
RCH 2Bt (Check)	0	23.83	4	4	12.6	18.0	25.2	31.5

**\*Grades**

Eventhough all the test entries have been found susceptible at varying degrees to Alternaria leaf spot, bacterial leaf blight and grey mildew, these diseases can be managed with early detection and application of proper plant protection measures.

**G. OVERALL ASSESSMENT**

Twenty six test hybrids were evaluated along with Bunny (non-Bt check) and RCH 2 Bt (Bt check) under both irrigated and rainfed situations.

The larval population of bollworm was low at all the centres. Square damage, boll damage were low at Guntur and Coimbatore and moderate at Siruguppa, Nandyal and

Dharwad. However, the percentage of bollworm damage was low in Bt hybrids as compared to the non-Bt check hybrid Bunny. All the entries tested were found to be susceptible to sucking pests and needed chemical intervention twice or thrice to control them. Similarly, one to two rounds of sprayings were also required to check the bollworm damage especially after 110 DAS.

Under high disease pressure, all the test entries as well as the check hybrids were found to be susceptible to the major diseases. However, they can be managed with proper early detection and timely plant protection measures.

Seven hybrids recorded higher seed cotton yield over the check hybrids under both irrigated and rainfed situations. These hybrids were superior to the check hybrids even under unprotected conditions. They are RCH 371 Bt, MRC 6100 Bt, MRC 7228 BG II, MRC 7351 BG II, NCS 913 Bt, NCEH 3R Bt and Brahma Bt.

Eight hybrids were superior to the check hybrids both under protected and unprotected conditions in the irrigated areas. They are NCEH 2R Bt, Tulasi 4 Bt, Tulasi 117 Bt, Dhanwan Bt, GK 207 Bt, GK 209 Bt, ACH 33-1 Bt and ACH 21-1 Bt.

Hybrids RCH 111 Bt and JKCH 99 Bt were superior under rainfed conditions. Under unprotected conditions also, they were the superior to the check hybrids.

Quality wise, all the hybrids were on par with the check hybrids.

## II. COMBINED REPORT OF INTERSPECIFIC HYBRID

Two interspecific hybrids RCHB 708 Bt and RCHB 702 Bt were evaluated during 2004-05 season. However, seed of RCHB 708 Bt alone was received from the seed company for conducting the second year trial. In the combined report, results of the two year trials of the interspecific hybrid RCHB 708 Bt have been reported. DCH 32, TCHB 213 and DHB 105 were the non-Bt check hybrids used in the trial.

The test hybrid RCHB 708 Bt recorded a mean boll weight of 4.2 g and was on par with DCH 32 and TCHB 213. RCHB 708 Bt recorded a mean ginning out turn of 32.4 per cent, as against 34.7 per cent of DCH 32 and 34.3 per cent of DHB 105. TCHB 213 recorded the lowest ginning out turn of 30.8 per cent (Table 1).

**Table 1. Boll weight (%) and ginning percentage**

Entry	Boll weight (g)			Ginning (%)		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCHB.708 Bt	4.1	4.2	4.2	33.3	31.6	32.4
DCH.32 (CC)	3.9	4.2	4.0	35.6	33.8	34.7
TCHB.213 (CC)	4	4.2	4.1	29.8	31.9	30.8
DHB.105 (CC)	3.8	3.9	3.8	33.9	34.6	34.3

The fibre properties of the test hybrid RCHB 708 Bt was found to be superior to all the other test hybrids (Table 2 and 3).

**Table 2. 2.5% Span length (mm) and Micronaire**

Entry	2.5% Span length (mm)			Micronaire		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCHB.708 Bt	35.7	35.0	35.3	3.6	3.7	3.7
DCH.32 (CC)	34.7	36.1	35.4	3.2	3.6	3.4
TCHB.213 (CC)	34.9	34.6	34.8	3.3	3.5	3.4
DHB.105 (CC)	32.0	31.5	31.8	3.4	3.8	3.6

**Table 3. Fibre strength (g/tex) and Overall fibre properties**

Entry	Strength g/tex			Overall fibre properties		
	2004-05	2005-06	Mean	2.5% Span length (mm)	Micronaire	Strength g/tex
RCHB.708 Bt	25.3	25.7	25.5	35.3	3.7	25.5
DCH.32 (CC)	23.5	24.5	24.0	35.4	3.4	24.0
TCHB.213 (CC)	24.3	24.2	24.3	34.8	3.4	24.3
DHB.105 (CC)	24.1	23.5	23.8	31.8	3.6	23.8

All the hybrids evaluated were found to be susceptible to sucking pests and warranted two to three times chemical intervention to control them (Table 4, 5 and 6).

**Table 4. Jassids population /plant - Under protected condition**

Entry	2004-05			2005-06			
	Coimbatore	Vaigai Dam	Mean	CBE	Vaigaidam	Dharwad	Mean
RCHB.708 Bt	6.80	12.50	9.65	3.3	3.9	4.31	3.8
DCH.32 (CC)	6.72	13.75	10.24	2.7	3.9	4.08	3.5
TCHB.213 (CC)	2.30	12.50	7.40	3.3	3.8	4.91	4.0
DHB.105 (CC)	6.92	11.50	9.21	3.7	3.9	5.55	4.4

**Table 5. Thrips population /plant - Under protected condition**

Entry	2004-05			2005-06		
	Coimbatore	Vaigai Dam	Mean	Vaigaidam	Dharwad	Mean
RCHB.708 Bt	2	9	5.5	1.5	37.27	19.4
DCH.32 (CC)	1.33	4.5	2.92	1.6	44.87	23.3
TCHB.213 (CC)	2.15	7.75	4.95	1.6	43.27	22.4
DHB.105 (CC)	1.05	6.75	3.9	1.5	48.53	25.0

**Table 6. Number of sprays for sap sucking pests – Protected**

Entry	2004-05	2005-06	Mean
RCHB.708 Bt	1.3	3	2.2
DCH.32 (CC)	1.3	3	2.2
TCHB.213 (CC)	1.3	3	2.2
DHB.105 (CC)	1.7	3	2.4

As regards bollworm damage, it was observed that the larval population under protected conditions and open boll and locule damage under both protected and unprotected conditions were less in RCHB 708 Bt, as compared to the other three check hybrids.

**Table 7. American boll worm (No. of larvae/5 plants)**

Entry	American bollworm		
	2004-05	2005-06	Mean
RCHB.708 Bt	0.63	1.5	1.08
DCH.32 (CC)	0.88	1.7	1.27
TCHB.213 (CC)	0.75	2.0	1.38
DHB.105 (CC)	0.88	2.1	1.48

**Table 8. Open boll damage (%) and locule damage (%) - Protected**

Entry	Open boll damage (%)			Locule damage (%)		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCHB.708 Bt	7.54	13.40	10.47	14.65	5.21	9.93
DCH.32 (CC)	6.42	17.39	11.91	22.10	9.83	15.96
TCHB.213 (CC)	7.38	18.67	13.03	30.25	6.24	18.25
DHB.105 (CC)	6.82	21.34	14.08	22.94	10.33	16.63

**Table 9. Open boll damage (%) and locule damage (%) – Unprotected Condition**

Entry	Open boll damage (%)			Locule damage (%)		
	2004-05	2005-06	Mean	2004-05	2005-06	Mean
RCHB.708 Bt	15.05	18.04	16.55	17.64	7.02	12.33
DCH.32 (CC)	18.91	28.45	23.68	31.75	13.41	22.58
TCHB.213 (CC)	16.00	24.95	20.48	29.43	8.48	18.96
DHB.105 (CC)	19.40	32.09	25.74	21.13	12.90	17.02

Mean seed cotton yield of RCHB 708 Bt was found to be the highest under both protected and unprotected conditions.

**Table 10. Mean seed cotton yield under protected condition (Kg/ha)**

Entry	2004-05	2005-06	Mean
RCHB.708 Bt	1499	1771	1635
DCH.32 (CC)	986	1264	1125
TCHB.213 (CC)	995	1389	1192
DHB.105 (CC)	1070	1141	1105

**Table 11. Mean seed cotton yield under Unprotected condition (Kg/ha)**

Entry	2004-05	2005-06	Mean
RCHB.708 Bt	1174	1290	1232
DCH.32 (CC)	760	808	784
TCHB.213 (CC)	862	831	846
DHB.105 (CC)	858	728	793

The test hybrid RCHB 708 Bt was found susceptible to Alternaria leaf spot, bacterial leaf blight and grey mildew at Dharwad during the two years of test and for Alternaria leaf spot at Coimbatore during 2004-05. There was low incidence of Alternaria leaf spot and grey mildew during 2005-06 at Coimbatore and the test hybrid RCHB 708 Bt was free from grey mildew and showed mild reaction to Alternaria leaf spot (Table 12).

**Table 12. Disease incidences on Bt entry during 2004-05 and 2005-06**

Entry	Alternaria leaf spot				Grey mildew			Bacterial leaf blight	
	2004-05		2005-06		2004-05		2005-06	Dharwad	
	CBE	Dharwad	CBE	Dharwad	CBE	Dharwad	Dharwad	2004-05	2005-06
RCHB 708 Bt	25.0	30.6	3.4	25.8	0.0	30.5	22.8	30.5	25.7
DCH 32 (cc)	17.5	28.6	2.4	26.3	0.0	31.3	26.5	28.4	28.7
TCHB 213 (cc)	22.5	27.9	1.9	27.5	11.3	33.7	26.8	30.2	28.7
DHB 105 (cc)	8.8	26.9	1.7	26.4	6.3	30.7	27.3	27.5	27.9

**Overall Summary**

The interspecific hybrid RCHB 708 Bt recorded higher yield and better fibre quality over all the other three non-Bt checks used in the trial. The overall bollworm damage in terms of open boll and locule damage was also less in RCHB 708 Bt.