

**Bt COTTON
EVALUATION REPORT**

**First year
(37 Bt cotton H x H hybrids)**

SOUTH ZONE

Submitted to
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

Project Co-ordinator (Cotton Improvement)
All India Coordinated Cotton Improvement Project
CENTRAL INSTITUTE FOR COTTON RESEARCH
Regional Station, Maruthamalai Road
Coimbatore-641 003
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Executive Summary

- The All India Coordinated Cotton Improvement Project (AICCIP) undertook the evaluation of **THRTY SEVEN Bt cotton hybrids, viz.,** NECH.2R, NECH.3R, **NECH.4R (detected to be H x B hybrid)**, Bunny VIP, 2-62 VIP, 2-42 VIP, JKCH.99, DURGA, ESWAR, ACH.11-1, ACH-21-1, ACH-33-1, RCH.524 X, RCH.111, RCH.371, MRC.6100, MRC.7228X, MRC.7351X, NCS.145, NCS.207, NCS.913, DHANWAN, BRAHMA, KDCHH.9632, KDCHH.531X, KDCHH.441X, PRCH.101, PRCH.102, PRCH.103, NPH.2270, NPH.2171, NPH.2250, GK.207, GK.208, GK.209, TULASI.4 & TULASI.117. The Bt check hybrids were RCH.2 Bt, MECH.162 Bt & local check hybrid was BUNNY.
- **The Bt hybrid, NECH.4R from Nath Seeds Pvt. Ltd., Aurangabad was seen to be H x B hybrid. Since this is an intra-hirsutum evaluation and this company has provided hirsutum x barbadense hybrid seed for this evaluation, the results of this hybrid is not included in this report and this hybrid entry shall not be included in the next year's evaluations also.**
- The germination of the genotypes was reasonably good in all locations and the plant stand was quite good. It was found out that NECH.4R of M/S Nath seeds Pvt. Ltd., Aurangabad turned out to be hirsutum x barbadense hybrid which was to have been separately entered in that category of trials.
- During this year, there was drought in Nandyal and Siruguppa centres and the crop growth was affected at various phenological stages.
- The American bollworm incidence was quite negligible in this zone during 2004 season and hence proper assessment of the reaction of these 37 hybrids could not be undertaken. This was the case in unsprayed conditions too in this zone. The percent locule damage was seen to be low in most of the hybrids. In some cases, it has been recorded at a range of 11.0 to 13.3. The check hybrid, Bunny recorded 15.5% locule damage. Some of the entries such as Bunny VIP, ACH-33-1, NPH.2250 (14.3%) recorded 13.3% locule damage.
- The Pink bollworm damage was indicated by the open boll damage measurements in these hybrids in this zone. The mean values are presented below. It is found that hybrids such as NRECH.2R and PRCH. 101 (11.1%) had high damage in comparison to Bt and non-Bt check hybrid. Other test hybrids also recorded higher than the Bunny check hybrid.
- Most of the hybrids needed 3.5 to 4.0 sprayings of insecticides to counter the sap sucking pests in breeding evaluation. These hybrids were seen to be susceptible to various sap sucking pests and demanded protection at various phenological stages.

- Under unprotected conditions, the locule damage was quite high. The gene action was amiss in these test hybrids and Pink bollworm damage was high; it may be noted that the other two bollworms were very low in population.
- There was very severe incidence of Alternaria leaf spot disease at the Dharwad and Siruguppa centres and all the forty hybrids were found susceptible to this disease (Grade 4). Very high incidence of Grey mildew was noticed in the Dharwad and Siruguppa centres and all the 40 hybrids were found susceptible (Grade 3 - 4) to this disease. Helminthosporium leaf spot and Cercospora leaf spot diseases were observed only in the Lam centre. All forty hybrids were found to be susceptible to these two diseases.
- The seed cotton yield data shows that, under protection against sap sucking pests, the mean seed cotton yield of the zone was at the maximum in **MRC.7351X (2692 kg/ha)**, **MRC.7228X (2637 kg/ha)**, **MRC.6100 (2186 kg/ha)**, **GK 208 (2159 kg/ha)**, **RCH.371 (2120 kg/ha)** and **BRAHMA (2105 kg/ha)**.
- The seed cotton yield under unprotected conditions was seen to be drastically less than that under protected conditions. The highest seed cotton yield was recorded in **MRC.7228X (2398 kg/ha)** and **MRC.7351X (2392 kg/ha)**. **MRC.6100 recorded (2048 kg/ha)** seed cotton. The seed cotton yield under unprotected conditions was seen to be drastically less than that under protected conditions. It is seen that these Bt hybrids needed insecticide support to provide appreciable seed cotton yield in this zone.
- The fibre strength and tenacity values in all the hybrids want in fibre strength commensurate with the span length. As is stipulated in All India Coordinated Cotton Improvement Project final stages of evaluations of genotypes, the full scale mill test could only bring out the merit of fibre, as stipulated by SITRA (South India Textile Research Association, Textile Ministry) norms.

Conclusions:

- ❖ The data on various parameters of evaluations of 36 test hybrids show that these hybrids are susceptible to sap sucking pests and the gene action to reduce Pink bollworm was also not evident due to high percentage of open boll damage.
- ❖ The fibre quality data of these hybrids do not provide enough evidence that they conform to SITRA norms that is now accepted as the yard-stick of fibre quality for achieving defined yarn quality and yield. Confirmation of this through full scale mill test is desirable to recommend the promising hybrids for cultivation by farmers in this zone. The worthiness of the genotype has to be based on their ability to reduce damage due to the three bollworms along with desirable fibre property.

EVALUATION REPORT FOR FIRST YEAR

Introduction

The All India Coordinated Cotton Improvement Project (AICCIP) undertook the evaluation of **THIRTY SEVEN Bt cotton hybrids, viz.,** NECH.2R, NECH.3R, **NECH.4R (detected to be H x B hybrid)**, Bunny VIP, 2-62 VIP, 2-42 VIP, JKCH.99, DURGA, ESWAR, ACH.11-1, ACH-21-1, ACH-33-1, RCH.524 X, RCH.111, RCH.371, MRC.6100, MRC.7228X, MRC.7351X, NCS.145, NCS.207, NCS.913, DHANWAN, BRAHMA, KDCHH.9632, KDCHH.531X, KDCHH.441X, PRCH.101, PRCH.102, PRCH.103, NPH.2270, NPH.2171, NPH.2250, GK.207, GK.208, GK.209, TULASI.4 & TULASI.117.

Out of these, NECH.4R was seen to be H x B hybrid from Nath Seeds Pvt. Ltd., Aurangabad. Since this is an intra-hirsutum evaluation and this company has provided hirsutum x barbedense hybrid, the results of this hybrid shall be withheld and next year, this hybrid entry will not be conducted.

The Bt check hybrids were RCH.2 Bt, MECH.162 Bt & local check hybrid was BUNNY. The Breeding and Plant Protection evaluations were conducted in five South Zone centres, viz., Tamil Nadu Agricultural University, Coimbatore and its RARS at Vaigai Dam, University of Agricultural Sciences, Dharwad and its RARS, Siruguppa, Acharya NG Ranga Agricultural University, RARS, Guntur and RARS, Nandyal for the FIRST year (vide ICAR letter No.2(8)/2003-C.C.I. dated 25.4.2003). During this year, there was drought in Nandyal and Siruguppa centres and the crop growth was affected at various phenological stages.

The trials were laid out in accordance with standard package of practices of cotton cultivation, followed at respective centers, where the evaluations were undertaken. The untreated, acid de-linted seeds of the relevant test hybrids were provided by the above seed companies. The relevant Bt check, local checks were included for comparison and results are furnished below:

BREEDING EVALUATION

DESIGN: Randomised Block Design 2 Replications – 3 ROWS X 6 metre rows with plant protection, based on recommended package of practices of the respective centres with plant protection against all pests and diseases at the prescribed economic threshold levels for each of those biotic stresses in the concerned entries from time to time, based on close monitoring for their incidence and damage. These observations on pests and diseases were also recorded from time to time.

PLANT PROTECTION EVALUATION

DESIGN: Randomised Block design 2 Replications – 3 ROWS X 6 metre rows with no plant protection measures against prevalent bollworms and diseases. However, protection against sap sucking pests in respective entries, based on the recommended practices of respective centres was made. These observations on pests and diseases were also recorded from time to time.

RESULTS OF EVALUATIONS

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

BREEDING EVALUATION

The breeding evaluation concentrated on various observations on plant biometric characters such as number of monopodia per plant, number of sympodia per plant, nodes per plant, mean length of sympodia, number of fruiting points per sympodium, number of green bolls per plant at harvest, number of burst bolls per plant at harvest, mean boll weight, seed index, Lint index, mean seed cotton yield per plant and per plot and final yield (calculated) of seed cotton yield per hectare in addition to the fibre length, strength and micronaire of the entries tested. The Germination data of the Breeding is given below. The general plant stand of all entries was quite good, as seen from the following tables.

Germination Data

The germination of the genotypes was reasonably good in all locations and the plant stand was quite good, as is shown below. It was found out that NECH.4R of M/S Nath seeds Pvt. Ltd., Aurangabad turned out to be hirsutum x barbadense hybrid which was to have been separately entered in that category of trials. Due to the late detection of this hybrid by centres, the results of the same are not given in this report.

Germination % under Breeding Evaluation

Entry	Siruguppa	TNAU	Nandyal	Lam Guntur	Dharwad	Mean
NECH.2R	92	80	95	29	93	78
NECH.3R	94	93	100	30	100	83
NECH.4R	98	93	100	30	100	84
Bunny VIP	90	93	100	30	100	83
2-62 VIP	96	93	99	30	100	84
2-42 VIP	87	93	99	30	100	82
JKCH.99	97	95	100	29	99	84
DURGA	91	93	100	30	100	83
ESWAR	93	90	99	29	97	82
ACH.11-1	92	95	100	30	100	83
ACH.21-1	92	98	100	30	100	84
ACH.33-1	97	95	100	30	99	84
RCH.524 X	93	98	100	30	100	84
RCH.111	99	98	100	30	99	85
RCH.371	92	95	99	30	100	83
MRC.6100	94	95	100	28	100	84
MRC.7228X	98	93	99	29	100	84
MRC.7351X	97	95	99	30	99	84
NCS.145	93	80	98	26	100	80
NCS.207	99	95	98	30	100	84
NCS.913	91	93	99	30	99	82
DHANWAN	99	93	100	30	99	84
BRAHMA	100	93	98	30	97	84
KDCHH.9632	97	93	100	30	98	83
KDCHH.531X	93	90	100	30	99	82
KDCHH.441X	91	90	100	29	99	82
PRCH.101	91	93	97	30	94	81
PRCH.102	92	93	99	29	88	80
PRCH.103	97	95	99	30	100	84
NPH.2270	90	95	98	29	98	82
NPH.2171	88	93	100	30	100	82
NPH.2250	93	93	98	28	100	83
GK.207	97	93	99	28	97	83
GK.208	98	95	99	30	99	84
GK.209	93	95	99	30	99	83
TULASI.4	97	95	100	30	98	84
TULASI.117	83	85	62	21	79	66
RCH.2 Bt	100	95	99	30	99	85
MECH.162 Bt	100	93	100	30	97	84
BUNNY	97	93	100	30	100	84
CD (0.05)	5.45	2.05	14.82	1.51	7.23	
CV%	3.56	3.55	9.5	3.2	4.54	

The position of first sympodial node and its mean length in various test hybrids are provided below. The data did not show any abnormal condition in the test hybrids.

Entry	First Sympodial Node			Mean Length of First Sympodium (cm)		
	TNAU	Nandyal	Mean	TNAU	Nandyal	Mean
NECH.2R	3.6	4.2	3.9	76.7	53.4	65.1
NECH.3R	1.7	4.3	3.0	63.0	55.4	59.2
Bunny VIP	3.3	3.5	3.4	46.7	51.4	49.1
2-62 VIP	2.8	3.5	3.2	54.7	36.5	45.6
2-42 VIP	2.6	4.2	3.4	56.7	40.3	48.5
JKCH.99	3.2	4.4	3.8	90.0	45.4	67.7
DURGA	2.6	3.4	3.0	56.7	35.3	46.0
ESWAR	3.5	4.2	3.9	104.3	36.6	70.5
ACH.11-1	4.1	5.2	4.7	71.0	58.4	64.7
ACH-21-1	3.0	3.8	3.4	58.3	42.6	50.5
ACH-33-1	3.7	4.1	3.9	51.0	42.6	46.8
RCH.524 X	3.1	3.6	3.4	118.3	43.5	80.9
RCH.111	2.6	4.6	3.6	120.3	41.3	80.8
RCH.371	2.8	4.4	3.6	103.3	38.3	70.8
MRC.6100	4.9	4.1	4.5	35.0	44.5	39.8
MRC.7228X	4.1	4.6	4.4	65.0	48.8	56.9
MRC.7351X	3.4	4.1	3.8	70.0	39.3	54.7
NCS.145	3.8	3.2	3.5	76.7	43.3	60.0
NCS.207	4.3	4.4	4.4	97.3	47.6	72.5
NCS.913	3.3	4.1	3.7	57.7	42.5	50.1
DHANWAN	2.0	4.4	3.2	62.0	41.4	51.7
BRAHMA	2.6	4.5	3.6	54.0	44.5	49.3
KDCHH.9632	3.6	4.4	4.0	57.7	50.4	54.1
KDCHH.531X	4.9	3.6	4.3	46.7	45.3	46.0
KDCHH.441X	2.0	5.0	3.5	76.3	42.5	59.4
PRCH.101	2.5	4.2	3.4	119.0	61.3	90.2
PRCH.102	2.4	4.2	3.3	35.7	45.6	40.7
PRCH.103	2.6	4.6	3.6	63.3	48.2	55.8
NPH.2270	1.5	3.6	2.6	37.3	35.5	36.4
NPH.2171	2.2	4.2	3.2	96.3	33.6	65.0
NPH.2250	2.8	4.2	3.5	69.3	51.2	60.3
GK.207	3.7	4.2	4.0	66.0	46.8	56.4
GK.208	3.6	4.1	3.9	54.3	38.4	46.4
GK.209	3.4	5.0	4.2	53.0	43.6	48.3
TULASI.4	3.0	4.6	3.8	42.7	43.3	43.0
TULASI.117	2.6	4.4	3.5	108.0	44.4	76.2
Checks						
RCH.2 Bt	3.5	4.2	3.9	37.3	42.3	39.8
MECH.162 Bt	2.3	4.6	3.5	67.0	51.6	59.3
BUNNY	4.0	4.2	4.1	72.3	47.4	59.9
CD (0.05)	0.7	0.34		10.97	1.82	
CV%	14.01	5.04		9.84	2.54	

Total number of bolls/plant

The total number of bolls per plant shows that the zone's mean in the test hybrids was within a range of 22-37.

Entry	Siruguppa	TNAU	Nandyal	Lam Guntur	Dharwad	Mean
NECH.2R	19.8	28.7	23.5	68.3	16.2	31.3
NECH.3R	26.3	27.7	28.5	63.6	16.4	32.5
Bunny VIP	17.6	20.0	16.7	52.8	13.1	24.0
2-62 VIP	13.1	21.0	10.9	37.1	12.1	18.9
2-42 VIP	20.3	26.9	12.6	44.3	13.1	23.4
JKCH.99	14.9	25.3	21.7	79.0	14.3	31.0
DURGA	24.1	28.2	11.5	67.2	14.1	29.0
ESWAR	15.9	24.7	20.4	56.4	12.6	26.0
ACH.11-1	21.5	30.7	22.2	61.9	17.0	30.6
ACH-21-1	24.2	23.9	14.5	65.6	18.2	29.3
ACH-33-1	26.5	42.3	16.7	76.7	23.9	37.2
RCH.524 X	20.8	24.7	22.5	83.2	19.8	34.2
RCH.111	20.3	24.7	24.3	93.8	16.7	36.0
RCH.371	25.7	24.7	19.6	71.4	20.9	32.5
MRC.6100	31.8	20.6	20.0	47.7	26.9	29.4
MRC.7228X	26.6	37.9	15.1	74.0	17.9	34.3
MRC.7351X	40.1	35.0	17.6	59.7	19.2	34.3
NCS.145	31.8	27.7	23.0	63.7	22.3	33.7
NCS.207	23.3	27.1	19.6	54.7	13.4	27.6
NCS.913	32.6	28.2	19.7	62.5	16.1	31.8
DHANWAN	20.7	28.4	18.3	46.0	18.3	26.3
BRAHMA	30.9	22.0	21.0	73.1	14.0	32.2
KDCHH.9632	16.0	30.2	15.9	60.4	12.5	27.0
KDCHH.531X	17.7	27.3	23.1	56.9	13.1	27.6
KDCHH.441X	17.1	26.6	19.6	51.9	14.3	25.9
PRCH.101	13.2	38.0	16.6	62.1	13.5	28.7
PRCH.102	17.9	27.7	18.2	55.1	12.5	26.3
PRCH.103	18.9	24.3	19.7	61.5	17.1	28.3
NPH.2270	15.2	22.3	12.1	52.9	18.0	24.1
NPH.2171	13.5	28.1	13.3	59.0	15.2	25.8
NPH.2250	14.0	35.3	11.3	36.6	15.1	22.5
GK.207	20.6	24.1	20.2	57.5	16.7	27.8
GK.208	20.0	23.9	15.8	73.5	16.9	30.0
GK.209	21.4	28.5	20.7	69.9	15.3	31.2
TULASI.4	19.9	25.8	16.2	50.0	15.7	25.5
TULASI.117	27.7	33.1	20.7	28.4	10.2	24.0
Checks						
RCH.2 Bt	20.8	27.7	17.5	64.8	13.7	19.9
MECH.162 Bt	20.3	28.4	13.4	75.1	16.6	30.8
BUNNY	20.6	22.8	15.7	58.4	14.1	26.3
CD (0.05)	3.27	5.92	8	12.03	4.9	
CV%	9.72	14.29	27.33	12.2	18.67	

Boll weight (g)

The boll weight was of the range of 4.0 to 5.4 g. There was no difference in boll weight between checks and test entries.

Entry	Siruguppa	TNAU	Nandyal	Lam Guntur	Dharwad	Mean
NECH.2R	4.2	5.4	3.0	4.6	5.2	4.5
NECH.3R	3.9	5.3	3.2	4.4	4.7	4.3
Bunny VIP	4.0	6.0	3.0	5.0	5.0	4.6
2-62 VIP	4.0	5.9	3.7	4.9	5.2	4.7
2-42 VIP	3.2	5.1	2.7	4.4	4.6	4.0
JKCH.99	4.0	5.1	3.5	4.3	4.6	4.3
DURGA	3.7	5.4	3.5	4.0	4.9	4.3
ESWAR	3.6	4.6	3.1	3.9	4.7	4.0
ACH.11-1	3.5	4.9	3.3	4.4	4.2	4.1
ACH-21-1	4.7	6.2	3.4	4.3	5.4	4.8
ACH-33-1	3.6	4.8	2.8	4.1	5.3	4.1
RCH.524 X	4.7	5.7	2.9	4.3	5.6	4.6
RCH.111	4.1	5.4	3.0	4.4	4.2	4.2
RCH.371	3.8	5.5	4.2	4.1	4.3	4.4
MRC.6100	4.2	5.5	4.1	4.6	5.0	4.7
MRC.7228X	5.0	6.2	3.9	4.8	5.8	5.1
MRC.7351X	5.2	6.2	4.6	5.3	5.7	5.4
NCS.145	4.4	5.1	3.3	4.1	4.8	4.3
NCS.207	4.4	5.4	4.3	4.8	5.6	4.9
NCS.913	3.9	5.4	3.5	0.1	4.4	3.4
DHANWAN	4.1	6.1	2.5	4.9	5.3	4.6
BRAHMA	4.2	4.9	4.3	5.1	5.2	4.7
KDCHH.9632	3.6	5.0	3.1	4.8	4.8	4.2
KDCHH.531X	4.4	5.6	3.1	4.8	5.1	4.6
KDCHH.441X	4.1	5.2	3.1	4.7	5.2	4.5
PRCH.101	4.0	4.9	2.9	4.6	4.5	4.2
PRCH.102	4.3	5.7	3.2	4.1	5.4	4.5
PRCH.103	3.5	5.6	2.7	4.3	4.6	4.1
NPH.2270	3.6	5.0	2.5	4.1	4.9	4.0
NPH.2171	3.6	4.5	3.0	3.9	4.9	4.0
NPH.2250	3.2	4.3	2.6	4.6	3.9	3.7
GK.207	3.7	5.0	3.3	4.2	4.4	4.1
GK.208	4.3	6.0	3.0	4.9	5.6	4.7
GK.209	3.7	4.9	2.9	4.6	4.4	4.1
TULASI.4	3.5	5.2	3.2	4.4	4.7	4.2
TULASI.117	3.6	4.1	2.7	4.2	4.1	3.7
RCH.2 Bt	4.2	5.1	3.3	4.7	4.8	4.4
MECH.162 Bt	3.5	4.8	2.5	3.8	3.9	3.7
BUNNY	3.7	5.7	3.3	4.2	5.1	4.4
CD (0.05)	0.3	0.7	0.3	0.8	0.7	
CV%	3.92	8.08	6.1	11.1	8.72	

Ginning Out Turn (%)

The percent ginning out turn was in a range of 33.7 to 38.2%. There was no difference between check hybrids and test hybrids in this regard.

Entry	Siruguppa	TNAU	Nandyal	Lam Guntur	Dharwad	Mean
NECH.2R	38.8	40.6	33.5	34.6	35.1	36.5
NECH.3R	37.7	32.2	34.6	34.4	35.4	34.9
Bunny VIP	34.6	35.3	33.0	33.2	32.2	33.7
2-62 VIP	36.4	36.1	34.5	37.4	34.9	35.9
2-42 VIP	38.2	37.0	36.0	35.2	34.4	36.2
JKCH.99	36.4	32.6	38.5	36.1	34.0	35.5
DURGA	37.5	43.6	36.0	36.7	37.3	38.2
ESWAR	37.5	40.1	37.0	36.0	36.3	37.4
ACH.11-1	37.2	33.9	39.5	36.2	34.3	36.2
ACH-21-1	36.2	37.6	34.8	33.0	33.4	35.0
ACH-33-1	38.4	35.8	30.0	34.0	34.2	34.5
RCH.524 X	31.8	31.1	31.0	34.7	30.9	31.9
RCH.111	34.9	35.2	39.0	33.6	33.4	35.2
RCH.371	40.2	37.2	38.0	34.6	36.7	37.3
MRC.6100	35.5	32.3	30.8	35.1	33.8	33.5
MRC.7228X	35.8	32.9	34.0	33.1	34.7	34.1
MRC.7351X	34.2	32.7	39.0	32.9	35.0	34.8
NCS.145	37.2	24.6	39.5	33.8	35.1	34.0
NCS.207	38.0	35.4	35.7	33.2	34.3	35.3
NCS.913	39.2	36.1	36.4	35.0	37.6	36.9
DHANWAN	36.9	35.3	33.0	33.2	35.8	34.8
BRAHMA	35.3	33.7	35.0	33.3	35.2	34.5
KDCHH.9632	35.4	36.0	39.0	33.4	33.6	35.5
KDCHH.531X	32.3	30.7	36.5	33.0	30.9	32.7
KDCHH.441X	33.0	35.5	38.4	33.5	34.3	34.94
PRCH.101	31.8	32.7	36.2	33.4	30.8	33.0
PRCH.102	38.0	38.5	35.6	34.1	36.0	36.4
PRCH.103	37.3	36.7	36.2	33.8	33.1	35.4
NPH.2270	33.5	37.4	34.0	34.5	33.1	34.5
NPH.2171	36.5	38.5	37.5	34.5	34.3	36.3
NPH.2250	38.2	36.1	37.0	34.0	35.6	36.2
GK.207	35.7	34.3	32.0	35.4	33.6	34.2
GK.208	37.1	35.3	39.8	35.4	34.7	36.5
GK.209	39.2	36.9	33.5	35.1	35.9	36.1
TULASI.4	36.3	34.4	36.4	34.4	34.0	35.1
TULASI.117	36.7	34.8	36.0	34.6	36.6	35.7
RCH.2 Bt	34.9	36.8	35.2	34.4	34.4	35.2
MECH.162 Bt	37.0	38.8	36.2	35.5	36.2	36.7
BUNNY	36.1	37.3	34.5	34.0	34.7	35.3
CD (0.05)	3.078	2.5		1.16	1.14	
CV%	5.23	4.4		2.1	2.05	

Mean lint Index (g)

The mean lint index of the zone was within a range of 4.5 to 5.8 g in this zone in these test hybrids.

Entry	Siruguppa	TNAU	Nandyal	Lam Guntur	Dharwad	Mean
NECH.2R	4.7	6.5	4.0	5.2	5.4	5.2
NECH.3R	4.5	5.3	5.0	5.1	4.6	4.9
Bunny VIP	3.9	6.8	4.0	4.8	4.8	4.9
2-62 VIP	4.5	6.7	5.0	6.3	5.4	5.6
2-42 VIP	4.4	5.8	4.0	5.3	4.7	4.8
JKCH.99	5.1	6.1	4.0	6.0	6.2	5.5
DURGA	4.4	7.2	4.0	5.4	5.4	5.3
ESWAR	3.9	6.1	3.0	5.0	4.6	4.5
ACH.11-1	3.8	5.6	4.0	5.2	5.4	4.8
ACH-21-1	5.6	8.0	5.0	4.4	6.2	5.8
ACH-33-1	4.4	6.0	3.0	4.7	4.7	4.5
RCH.524 X	5.3	6.1	4.0	6.2	5.9	5.5
RCH.111	3.9	6.7	6.0	5.0	5.0	5.3
RCH.371	5.4	7.3	5.0	5.4	5.8	5.8
MRC.6100	4.5	5.5	4.0	5.9	4.9	5.0
MRC.7228X	5.5	5.8	5.0	5.5	5.8	5.5
MRC.7351X	5.3	5.7	5.0	4.7	5.4	5.2
NCS.145	4.9	5.9	4.0	4.4	5.9	5.0
NCS.207	4.6	6.2	5.0	5.1	5.2	5.2
NCS.913	4.4	6.3	4.0	5.2	5.4	5.1
DHANWAN	4.3	6.7	4.0	5.7	5.0	5.1
BRAHMA	4.4	5.7	4.0	5.0	5.5	4.9
KDCHH.9632	4.1	6.2	5.0	5.2	5.0	5.1
KDCHH.531X	4.3	6.3	4.0	5.0	4.5	4.8
KDCHH.441X	4.4	6.7	5.0	5.2	5.2	5.3
PRCH.101	3.9	5.2	4.0	4.7	4.4	4.4
PRCH.102	4.3	6.9	5.0	5.6	5.6	5.5
PRCH.103	3.9	6.1	4.0	4.3	4.5	4.6
NPH.2270	3.7	6.8	4.0	4.9	4.5	4.8
NPH.2171	3.7	5.5	5.0	4.6	4.7	4.7
NPH.2250	4.7	5.9	5.0	4.7	5.5	5.2
GK.207	4.0	6.4	3.0	5.3	4.0	4.6
GK.208	5.0	7.6	6.0	6.0	6.4	6.2
GK.209	4.7	8.6	4.0	5.5	5.0	5.6
TULASI.4	4.0	5.4	4.0	5.1	4.6	4.6
TULASI.117	3.7	4.9	4.0	4.8	4.0	4.3
RCH.2 Bt	4.6	6.9	5.0	5.2	5.3	5.4
MECH.162 Bt	4.37	6.2	4.0	4.9	4.5	4.9
BUNNY	4.3	6.4	5.0	4.7	4.8	5.0
CD (0.05)	0.66	0.62		0.63	0.35	
CV%	9.19	6.21		7.6	4.18	

Mean Seed Index (g)

The mean seed index was of the range of 8.6 to 11.5. Some of the test hybrids have shown high seed index as in the case of GK.208 (11.5).

Entry	Siruguppa	TNAU	Nandyal	Lam Guntur	Dharwad	Mean
NECH.2R	7.5	9.5	8.0	9.7	10.0	8.9
NECH.3R	7.4	11.1	9.0	9.7	8.0	9.0
Bunny VIP	7.4	12.5	8.0	10.8	10.0	9.8
2-62 VIP	7.9	11.9	9.0	10.0	10.0	9.8
2-42 VIP	7.1	9.9	7.0	9.8	9.0	8.6
JKCH.99	9.0	12.7	10.0	10.2	12.0	10.8
DURGA	7.3	9.3	5.0	8.6	9.0	7.8
ESWAR	6.5	9.2	5.0	8.4	8.0	7.4
ACH.11-1	6.4	11.0	4.0	9.1	10.3	8.2
ACH-21-1	9.8	13.3	9.0	8.7	12.0	10.6
ACH-33-1	7.0	10.7	7.0	9.4	9.0	8.6
RCH.524 X	11.3	13.4	9.0	10.9	13.0	11.5
RCH.111	7.3	12.3	8.0	9.9	10.0	9.5
RCH.371	8.0	12.2	8.0	9.7	10.0	9.6
MRC.6100	8.2	11.6	9.0	10.6	9.0	9.7
MRC.7228X	9.9	11.8	10.0	11.1	11.0	10.7
MRC.7351X	10.1	11.7	7.0	11.1	10.0	10.0
NCS.145	8.3	11.2	6.0	8.9	11.0	9.1
NCS.207	7.5	11.4	9.0	9.6	10.0	9.5
NCS.913	6.8	11.1	7.0	8.9	9.0	8.6
DHANWAN	7.3	12.3	8.0	11.2	9.0	9.6
BRAHMA	8.0	11.2	8.0	9.9	10.0	9.4
KDCHH.9632	7.4	10.9	7.0	10.4	10.0	9.1
KDCHH.531X	9.1	14.2	7.0	10.1	10.0	10.1
KDCHH.441X	8.6	12.2	8.0	10.8	10.0	9.9
PRCH.101	8.3	10.6	7.0	9.7	10.0	9.1
PRCH.102	8.1	11.1	9.0	9.8	10.0	9.6
PRCH.103	6.6	10.6	7.0	8.7	9.0	8.4
NPH.2270	7.4	11.3	8.0	9.6	9.0	9.1
NPH.2171	6.4	8.8	8.0	8.6	9.0	8.2
NPH.2250	7.5	10.5	8.0	9.7	10.0	9.1
GK.207	7.3	12.3	7.0	10.0	8.0	8.9
GK.208	8.2	13.9	12.0	11.5	12.0	11.5
GK.209	7.2	14.7	8.0	10.1	9.0	9.8
TULASI.4	7.1	10.3	7.0	9.8	9.0	8.6
TULASI.117	6.3	9.3	7.0	9.1	7.0	7.7
RCH.2 Bt	8.6	11.8	9.0	10.0	10.0	9.9
MECH.162 Bt	7.4	9.8	7.0	9.0	8.0	8.2
BUNNY	7.5	10.8	10.0	9.2	9.0	9.3
CD (0.05)	0.446	1.14		1.08	0.14	
CV%	3.5	6.24		6.8	0.94	

Seed Cotton Yield (kg/ha) - under Protected Condition

The seed cotton yield data is given below. it is found that under protection against sap sucking pests, the mean seed cotton yield of the zone was at the maximum in MRC.7351X (2692 kg/ha), MRC.7228X (2637 kg/ha), MRC.6100 (2186 kg/ha), GK 208 (2159 kg/ha), RCH.371 (2120 kg/ha) and BRAHMA (2105 kg/ha). The seed cotton yield in the case of certain hybrids at Siruguppa and Nandyal was low due to drought conditions.

Entry	Siruguppa	TNAU	Nandyal	Lam Guntur	Dharwad	Mean
NECH.2R	1525	2593	1035	4034	659	1969
NECH.3R	2075	2481	1243	3393	686	1976
Bunny VIP	752	1883	809	3141	513	1420
2-62 VIP	647	2222	694	2189	534	1257
2-42 VIP	1214	2202	587	2365	540	1382
JKCH.99	1537	1944	1319	4003	591	1879
DURGA	1386	2428	670	3164	480	1626
ESWAR	847	2233	862	2541	474	1391
ACH.11-1	1424	2874	951	2818	541	1722
ACH-21-1	1960	2860	945	3189	997	1990
ACH-33-1	1771	2782	714	3648	952	1973
RCH.524 X	1537	1656	1024	4095	725	1807
RCH.111	1361	1831	1092	4472	793	1910
RCH.371	1971	2953	1319	3499	857	2120
MRC.6100	2711	2953	1591	2558	1116	2186
MRC.7228X	3217	3539	1229	4220	980	2637
MRC.7351X	3852	3673	1448	3717	770	2692
NCS.145	2864	1965	1168	3050	794	1968
NCS.207	2239	2119	1006	3115	691	1834
NCS.913	1783	2459	969	2947	753	1782
DHANWAN	1785	2344	704	2545	615	1599
BRAHMA	1202	2870	1344	4394	715	2105
KDCHH.9632	1763	2212	859	3329	721	1777
KDCHH.531X	1828	2737	987	3179	655	1877
KDCHH.441X	940	2099	924	2865	620	1490
PRCH.101	1015	2027	1040	3347	538	1593
PRCH.102	1563	2325	930	2622	379	1564
PRCH.103	1152	2942	1001	2959	734	1758
NPH.2270	795	2953	929	2056	798	1506
NPH.2171	706	1646	642	2536	546	1215
NPH.2250	1501	1492	345	1740	384	1092
GK.207	1819	2562	811	2565	761	1704
GK.208	1715	2860	1099	4304	815	2159
GK.209	1297	3148	1008	3667	732	1970
TULASI.4	1263	2716	859	2531	607	1595
TULASI.117	1749	2160	696	1196	438	1248
Check hybrids						
RCH.2 Bt	1388	2438	935	3372	761	1779
MECH.162 Bt	1214	2078	658	3376	599	1585
BUNNY	645	2510	466	2573	484	1336
CD (0.05)	24.52	425.99	650	582.8	217	
CV%		10.91	26.79	11.6	19.98	

Fibre quality parameters of the test Bt hybrids

The fibre property was assessed and it was found that there were test hybrids such as 2-62 VIP, JKCH.99, Eswar, ACH.11-1, RCH. 371, PRCH.101, PRCH.103, NPH.2270, NPH.2171, NPH.2250, GK.209 and MECH.162Bt (check hybrid) recorded a mean ratio of 0.8 between strength and length. The details of the various important parameters are given below.

Fibre length and tenacity data in South zone

Entry	2.5% span length				Strength			
	TNAU	Nandyal	Guntur	Mean	TNAU	Nandyal	Guntur	Mean
NECH.2R	33.4	31.3	32.3	32.4	23.7	23.6	20.9	22.7
NECH.3R	32.8	30.7	29.0	30.8	22.1	19.7	20.1	20.6
Bunny VIP	33.6	29.6	30.6	31.3	22.7	23	21	22.2
2-62 VIP	31.2	27.9	28.5	29.2	21.5	27.6	20.6	23.2
2-42 VIP	30.0	29.8	28.9	29.6	21.8	22.4	19.7	21.3
JKCH.99	25.9	25.8	25.6	25.8	18.8	21.3	18.8	19.6
DURGA	28.0	25.7	29.0	27.6	20.2	19.4	21.3	20.3
ESWAR	29.9	26.6	28.8	28.4	22	24.1	21.1	22.4
ACH.11-1	27.0	26.1	26.3	26.5	21	21.8	22.1	21.6
ACH-21-1	31.8	26.5	29.1	29.1	21.9	22.1	20.6	21.5
ACH-33-1	29.3	24.9	28.2	27.5	20.4	21.1	19.9	20.5
RCH.524 X	34.5	32.4	31.7	32.9	22	22.6	21.6	22.1
RCH.111	33.4	29.3	29.8	30.8	22	21.3	20.3	21.2
RCH.371	29.9	28.4	26.6	28.3	21.3	22.5	19.9	21.2
MRC.6100	31.9	28.4	27.5	29.3	20.2	19.4	19.9	19.8
MRC.7228X	29.9	26.7	27.5	28.0	22.5	20	21.4	21.3
MRC.7351X	31.8	31.0	28.9	30.6	20.6	22.8	19.7	21.0
NCS.145	33.8	30.6	31.5	32.0	20.7	26.1	20	22.3
NCS.207	34.0	31.7	29.7	31.8	21.3	21.3	21.7	21.4
NCS.913	30.9	22.2	29.1	27.4	19.3	21.3	20.3	20.3
DHANWAN	31.0	20.7	27.9	26.5	20.2	21.8	19.4	20.5
BRAHMA	31.6	32.7	31.4	31.9	21.7	22	21.4	21.7
KDCHH.9632	28.1	30.4	29.6	29.3	18.7	22	20.1	20.3
KDCHH.531X	30.5	24.8	27.8	27.7	19	21.8	19.5	20.1
KDCHH.441X	30.1	27.3	27.7	28.4	21.1	22.4	19.1	20.9
PRCH.101	30.0	27.1	29.9	29.0	22	22.9	21.9	22.3
PRCH.102	31.4	28.8	29.8	30.0	22.7	21.1	21.3	21.7
PRCH.103	29.9	26.8	26.7	27.8	21	22.2	21.2	21.5
NPH.2270	29.1	25.5	29.0	27.9	21.7	22.4	20.6	21.6
NPH.2171	27.0	26.9	27.4	27.1	19.2	24.6	20.2	21.3
NPH.2250	27.0	25.4	27.8	26.7	20.7	20.3	20.9	20.6
GK.207	32.8	29.7	30.2	30.9	20.6	23.1	21.8	21.8
GK.208	31.6	29.6	28.9	30.0	19.6	20.7	20.7	20.3
GK.209	30.5	25.3	28.9	28.2	22	20.4	22.1	21.5
TULASI.4	26.6	20.9	28.0	25.2	18.9	20.4	19.7	19.7
TULASI.117	28.3	26.5	27.2	27.3	20.1	20	19.5	19.9
Check hybrids								
RCH.2 Bt	34.8	31.0	30.0	31.9	20.9	20.3	18.9	20.0
MECH.162 Bt	25.1	23.4	25.0	24.5	18.2	20.5	19.4	19.4
BUNNY	30.8	31.1	30.8	30.9	20.4	22.9	20.7	21.3

Micronaire value and uniformity ratio in South zone

Entry	Micronaire value				Uniformity Ratio			
	TNAU	Nandyal	Lam Guntur	Mean	TNAU	Nandyal	Lam Guntur	Mean
NECH.2R	4.0	2.3	5.1	3.8	52.0	4.6	49.5	35.4
NECH.3R	3.6	2.8	5.0	3.8	49.0	41.4	47.7	46.0
Bunny VIP	3.7	2.5	4.6	3.6	50.0	46.1	51.1	49.1
2-62 VIP	4.4	3.1	5.3	4.3	50.0	47.7	49.0	48.9
2-42 VIP	4.1	2.7	4.8	3.9	51.0	49.8	50.9	50.6
JKCH.99	4.8	3.9	6.0	4.9	52.0	50.3	51.5	51.3
DURGA	5.0	2.8	4.5	4.1	51.0	48.1	49.7	49.6
ESWAR	4.1	3.0	4.5	3.9	50.0	50.6	49.1	49.9
ACH.11-1	4.3	2.8	5.0	4.0	52.0	53.4	52.7	52.7
ACH-21-1	4.3	2.6	4.7	3.9	53.0	45.5	47.9	48.8
ACH-33-1	4.3	2.5	5.1	4.0	51.0	47.2	49.0	49.1
RCH.524 X	4.0	2.6	5.0	3.9	51.0	44.7	48.0	47.9
RCH.111	4.1	2.6	4.8	3.8	53.0	45.6	47.0	48.5
RCH.371	4.5	2.8	5.0	4.1	51.0	50.7	47.0	49.6
MRC.6100	4.1	2.9	4.9	4.0	47.0	43.0	46.9	45.6
MRC.7228X	4.4	3.0	5.3	4.2	53.0	48.7	53.2	51.6
MRC.7351X	4.0	3.0	5.2	4.1	52.0	46.2	47.4	48.5
NCS.145	3.4	2.5	4.9	3.6	47.0	46.7	48.4	47.4
NCS.207	3.8	2.6	4.9	3.8	49.0	48.1	47.0	48.0
NCS.913	4.4	2.7	5.0	4.0	50.0	43.1	46.9	46.7
DHANWAN	4.2	2.8	5.2	4.1	51.0	44.7	48.7	48.1
BRAHMA	4.0	2.7	4.9	3.9	52.0	46.6	47.9	48.8
KDCHH.9632	4.5	3.0	5.2	4.2	53.0	47.5	49.8	50.1
KDCHH.531X	4.5	2.5	5.0	4.0	52.0	49.8	47.6	49.8
KDCHH.441X	3.4	2.3	4.9	3.5	50.0	47.7	47.7	48.5
PRCH.101	3.7	2.8	4.7	3.7	53.0	45.1	50.5	49.5
PRCH.102	4.7	3.2	5.6	4.5	49.0	49.3	48.7	49.0
PRCH.103	3.8	2.3	4.3	3.5	52.0	49.5	49.4	50.3
NPH.2270	4.2	2.9	4.9	4.0	53.0	48.2	47.1	49.4
NPH.2171	4.3	2.8	4.8	4.0	53.0	47.6	47.2	49.3
NPH.2250	4.4	2.8	5.6	4.3	51.0	48.2	51.9	50.4
GK.207	3.9	2.4	4.6	3.6	50.0	47.4	50.1	49.2
GK.208	5.0	3.6	6.0	4.9	51.0	48.8	49.7	49.8
GK.209	4.2	2.4	4.6	3.7	50.0	44.7	49.3	48.0
TULASI.4	4.2	2.8	4.8	3.9	52.0	45.4	49.8	49.1
TULASI.117	3.8	2.5	4.3	3.6	51.0	48.1	45.4	48.2
Check hybrids								
RCH.2 Bt	3.9	2.7	4.7	3.8	50.0	46.0	46.0	47.3
MECH.162 Bt	4.0	2.5	5.3	4.0	52.0	46.8	51.6	50.1
BUNNY	4.2	3.0	5.1	4.1	49.0	46.3	46.2	47.2

The table below compares the fibre strength and tenacity values across the respective micronaire values. It is seen that all the hybrids want in fibre strength commensurate with the span length. As is stipulated in All India Coordinated Cotton Improvement Project final stages of evaluations of genotypes, the full scale mill test could only bring out the merit of fibre, as stipulated by SITRA (South India Textile Research Association, Textile Ministry) norms.

Comparative mean values of span length, fibre strength and micronaire data

Entry	Span length (mm)	Fibre tenacity (g/tex)	Micronaire
NECH.2R	32.4	22.7	3.8
NECH.3R	30.8	20.6	3.8
Bunny VIP	31.3	22.2	3.6
2-62 VIP	29.2	23.2	4.3
2-42 VIP	29.6	21.3	3.9
JKCH.99	25.8	19.6	4.9
DURGA	27.6	20.3	4.1
ESWAR	28.4	22.4	3.9
ACH.11-1	26.5	21.6	4.0
ACH-21-1	29.1	21.5	3.9
ACH-33-1	27.5	20.5	4.0
RCH.524 X	32.9	22.1	3.9
RCH.111	30.8	21.2	3.8
RCH.371	28.3	21.2	4.1
MRC.6100	29.3	19.8	4.0
MRC.7228X	28.0	21.3	4.2
MRC.7351X	30.6	21.0	4.1
NCS.145	32.0	22.3	3.6
NCS.207	31.8	21.4	3.8
NCS.913	27.4	20.3	4.0
DHANWAN	26.5	20.5	4.1
BRAHMA	31.9	21.7	3.9
KDCHH.9632	29.3	20.3	4.2
KDCHH.531X	27.7	20.1	4.0
KDCHH.441X	28.4	20.9	3.5
PRCH.101	29.0	22.3	3.7
PRCH.102	30.0	21.7	4.5
PRCH.103	27.8	21.5	3.5
NPH.2270	27.9	21.6	4.0
NPH.2171	27.1	21.3	4.0
NPH.2250	26.7	20.6	4.3
GK.207	30.9	21.8	3.6
GK.208	30.0	20.3	4.9
GK.209	28.2	21.5	3.7
TULASI.4	25.2	19.7	3.9
TULASI.117	27.3	19.9	3.6
Check hybrids			
RCH.2 Bt	31.9	20.0	3.8
MECH.162 Bt	24.5	19.4	4.0
BUNNY	30.9	21.3	4.1

PLANT PROTECTION EVALUATION - Protected Condition

The mean Jassid incidence in the zone in the 37 test hybrids was assessed and given below. All the hybrids were seen to be susceptible to this pest, warranting chemical insecticide spraying.

Jassids (average of 3 leaves/plant)

Entry	Siruguppa	TNAU	Nandyal		Lam Guntur		Mean Number
	Number	Number	*TV	Number	TV	Number	
NECH.2R	1.0	6.0	2.5	5.7	1.2	0.7	3.3
NECH.3R	0.9	3.2	2.3	4.6	1.3	0.9	2.4
Bunny VIP	1.0	4.0	2.0	3.9	1.6	1.8	2.7
2-62 VIP	1.2	8.0	2.6	7.5	2.0	2.9	4.9
2-42 VIP	1.7	4.8	2.6	6.8	2.5	5.3	4.6
JKCH.99	0.9	3.2	2.6	6.9	1.9	2.9	3.5
DURGA	1.1	5.0	2.1	4.3	2.2	4.1	3.6
ESWAR	1.0	4.1	2.7	7.3	2.7	6.2	4.7
ACH.11-1	1.3	8.1	2.3	4.8	2.1	3.9	4.5
ACH-21-1	1.3	6.2	2.0	6.7	1.8	2.4	4.1
ACH-33-1	1.3	4.2	2.0	3.5	2.6	6.3	3.8
RCH.524 X	1.0	3.6	2.7	6.9	2.3	4.1	3.9
RCH.111	1.5	9.2	2.4	5.1	2.1	3.5	4.8
RCH.371	1.0	4.4	2.2	4.3	1.9	3.1	3.2
MRC.6100	1.1	5.2	2.4	5.3	1.9	2.6	3.6
MRC.7228X	1.2	6.2	2.0	3.5	1.2	0.6	2.9
MRC.7351X	1.4	6.2	2.1	4.0	1.8	2.1	3.4
NCS.145	0.7	4.8	2.3	4.7	1.8	2.6	3.2
NCS.207	1.1	5.2	2.9	9.6	2.1	2.4	4.6
NCS.913	1.4	6.8	2.5	6.0	2.6	5.8	5.0
DHANWAN	1.9	6.2	2.3	4.9	3.0	7.9	5.2
BRAHMA	1.5	4.8	2.6	6.4	2.5	6.5	4.8
KDCHH.9632	1.0	8.1	1.6	2.1	2.3	4.5	3.9
KDCHH.531X	1.1	5.6	2.0	3.7	1.9	2.3	3.2
KDCHH.441X	1.3	6.0	2.0	3.6	2.0	3.1	3.5
PRCH.101	1.7	6.3	2.5	6.2	1.2	4.1	4.6
PRCH.102	1.7	5.4	2.0	3.3	2.3	4.3	3.7
PRCH.103	1.6	6.2	2.1	4.0	2.2	3.9	3.9
NPH.2270	1.5	4.4	2.3	5.5	2.0	2.9	3.6
NPH.2171	1.6	5.4	1.9	3.2	2.3	5.5	3.9
NPH.2250	1.1	4.2	2.2	4.7	1.9	2.9	3.2
GK.207	1.1	4.2	2.1	3.9	1.3	0.7	2.5
GK.208	0.6	2.8	1.9	3.7	1.5	1.3	2.1
GK.209	1.5	4.2	1.5	1.9	2.1	3.3	2.7
TULASI.4	1.7	7.0	2.1	4.4	2.0	3.3	4.1
TULASI.117	1.1	8.2	2.4	5.6	1.9	2.5	4.3
RCH.2 Bt	0.8	6.2	2.3	4.9	1.8	3.3	3.8
MECH.162 Bt	1.3	7.8	2.2	4.5	1.7	2.0	3.9
BUNNY	1.2	8.8	1.7	2.6	2.1	3.4	4.0
CD (0.05)	0.402	1.06		0.8	0.9	0.9	
CV%	19.71	14.43		22.37	28.1	28.1	

* TV- transformed values

Thrips(average of 3 leaves/plant)

The mean thrips population in the zone in the 37 test hybrids was assessed and given below. All the hybrids were seen to be susceptible to this pest, warranting chemical insecticide spraying.

Entry	TNAU	Nandyal		Lam Guntur		Mean number
	Number	*TV	Number	TV	Number	
NECH.2R	2.0	2.8	8.2	4.5	19.7	10.0
NECH.3R	0.3	5.9	34.8	4.2	17.6	17.6
Bunny VIP	1.3	4.0	15.8	4.9	22.5	13.2
2-62 VIP	2.4	4.4	19.0	4.5	19.9	13.8
2-42 VIP	2.0	3.3	11.0	2.9	8.6	7.2
JKCH.99	0.8	3.4	12.0	4.0	14.9	9.2
DURGA	1.5	4.6	20.8	4.7	21.6	14.6
ESWAR	2.3	4.2	17.6	4.7	21.1	13.7
ACH.11-1	2.5	6.6	44.6	4.5	19.1	22.1
ACH-21-1	0.8	4.1	16.1	4.8	22.5	13.1
ACH-33-1	0.8	4.5	22.4	4.4	18.9	14.0
RCH.524 X	1.3	4.7	21.4	4.9	22.9	15.2
RCH.111	3.0	3.9	16.2	4.4	19.7	13.0
RCH.371	0.6	6.3	39.0	4.7	21.1	20.2
MRC.6100	0.8	6.2	46.2	2.5	5.1	17.4
MRC.7228X	0.0	8.2	66.2	2.3	10.7	25.6
MRC.7351X	0.0	6.6	43.6	4.1	17.1	20.2
NCS.145	1.2	4.6	21.6	4.7	20.9	14.6
NCS.207	1.1	3.7	14.4	4.5	19.5	11.7
NCS.913	0.8	2.7	8.6	4.1	15.9	8.4
DHANWAN	1.1	5.9	34.6	3.0	9.1	14.9
BRAHMA	0.9	4.9	24.4	9.5	12.4	12.6
KDCHH.9632	2.2	3.5	12.0	4.4	18.4	10.9
KDCHH.531X	1.2	5.4	29.6	3.5	11.9	14.2
KDCHH.441X	1.2	4.2	17.0	1.8	2.2	6.8
PRCH.101	0.9	4.6	21.6	4.1	16.2	12.9
PRCH.102	1.2	3.9	16.2	4.4	20.2	12.5
PRCH.103	2.0	4.5	20.0	4.7	21.7	14.6
NPH.2270	1.4	3.2	10.4	3.8	13.9	8.6
NPH.2171	1.0	4.1	18.8	3.9	15.4	11.7
NPH.2250	1.2	4.4	19.4	3.3	9.9	10.2
GK.207	2.2	4.9	23.5	4.4	18.6	14.7
GK.208	1.1	5.1	28.2	4.6	21.2	16.8
GK.209	0.0	5.2	28.6	5.0	14.9	14.5
TULASI.4	2.2	4.7	24.4	4.6	20.3	15.6
TULASI.117	1.0	3.5	11.8	3.6	12.3	8.4
RCH.2 Bt	1.5	3.5	12.5	4.1	15.8	9.9
MECH.162 Bt	1.3	6.0	37.7	4.1	15.7	18.2
BUNNY	2.2	4.8	21.2	4.5	19.3	14.2
CD (0.05)	0.58		11.97		NS	
CV%	7.64		26.13		40	

* TV- transformed values

Whitefly (average of 3 leaves/plant)

The mean whitefly incidence in the zone in the 37 test hybrids was assessed and given below. The whitefly was at a low level during 2004 season in this zone.

Entry	TNAU	Nandyal		Lam Guntur		Mean number
	Number	*TV	Number	TV	Number	
NECH.2R	5.4	1.5	1.9	1.6	1.5	2.9
NECH.3R	6.2	1.7	2.4	1.8	2.3	3.6
Bunny VIP	4.4	1.6	2.3	1.4	1.7	2.8
2-62 VIP	8.2	1.6	2.0	1.4	1.9	4.0
2-42 VIP	6.2	1.4	1.5	1.5	1.4	3.0
JKCH.99	2.4	1.6	2.1	1.6	1.7	2.1
DURGA	3.6	1.5	1.7	1.4	0.9	2.1
ESWAR	7.4	1.4	1.8	1.5	1.1	3.4
ACH.11-1	6.2	1.7	2.5	2.5	5.5	4.7
ACH-21-1	7.8	1.7	2.4	1.6	2.1	4.1
ACH-33-1	8.8	1.6	2.2	1.7	1.9	4.3
RCH.524 X	4.2	1.7	2.3	1.8	2.3	2.9
RCH.111	2.4	1.9	3.1	1.3	0.7	2.1
RCH.371	3.8	2.2	4.9	1.8	2.3	3.7
MRC.6100	4.4	1.6	2.3	2.3	4.1	3.6
MRC.7228X	6.2	1.6	2.2	1.6	1.6	3.3
MRC.7351X	5.4	2.2	4.4	2.3	4.5	4.8
NCS.145	6.2	1.8	2.6	2.1	3.5	4.1
NCS.207	4.8	1.8	2.6	2.0	3.8	3.7
NCS.913	5.2	1.5	1.7	1.7	1.8	2.9
DHANWAN	7.4	1.3	1.3	1.5	1.4	3.4
BRAHMA	5.8	1.7	2.3	1.8	2.2	3.4
KDCHH.9632	4.2	1.4	1.5	1.5	1.4	2.4
KDCHH.531X	3.4	1.4	1.5	1.8	2.5	2.5
KDCHH.441X	6.8	1.8	2.9	1.4	1.3	3.6
PRCH.101	2.8	1.9	3.3	1.6	1.4	2.5
PRCH.102	5.2	11.7	2.6	1.4	1.1	3.0
PRCH.103	4.4	1.6	2.2	1.7	2.3	3.0
NPH.2270	2.3	1.7	2.3	2.2	4.3	3.0
NPH.2171	2.3	1.4	4.4	1.6	1.4	2.7
NPH.2250	8.6	1.1	0.8	1.6	1.5	3.7
GK.207	8.2	1.7	2.5	1.7	1.8	4.2
GK.208	6.4	1.8	3.0	1.9	2.1	3.8
GK.209	7.2	1.8	2.8	2.7	2.1	4.0
TULASI.4	4.4	2.1	4.1	1.4	6.7	5.0
TULASI.117	5.2	1.5	1.8	1.6	0.9	2.6
RCH.2 Bt	6.0	1.6	2.0	1.8	1.4	3.1
MECH.162 Bt	4.8	1.6	2.2	1.6	2.3	3.1
BUNNY	5.4	1.8	2.7		3.6	3.9
CD (0.05)	0.58		0.55		0.6	
CV%	20.74		20.63		22.1	

* TV- transformed values

American bollworms

The American bollworm incidence was quite negligible in this zone during 2004 season and hence proper assessment of the reaction of these 37 hybrids could not be undertaken. The following data shows the poor incidence in this zone.

Entry	Siruguppa	TNAU	Nandyal		Lam Guntur		Mean Number/ plant
	Number/ plant	Number/ plant	*TV	Number/ plant	TV	Number/ plant	
NECH.2R	1.1	1.0	1.5	2.0	1.0	0.0	1.0
NECH.3R	0.4	2.0	0.7	0.0	1.0	0.7	0.8
Bunny VIP	0.2	0.0	1.0	0.7	1.0	0.0	0.2
2-62 VIP	0.3	2.0	0.9	0.3	1.1	0.1	0.7
2-42 VIP	0.6	1.0	0.7	0.0	1.0	0.0	0.4
JKCH.99	0.2	2.0	0.7	0.0	1.0	0.0	0.6
DURGA	0.7	0.0	0.9	0.3	1.0	0.0	0.3
ESWAR	0.6	0.0	1.2	1.0	1.0	0.0	0.4
ACH.11-1	0.5	1.0	1.2	1.0	1.1	0.1	0.7
ACH-21-1	0.4	0.0	1.5	2.0	1.1	0.1	0.6
ACH-33-1	0.6	1.0	0.7	0.0	1.1	0.1	0.4
RCH.524 X	0.3	1.0	0.9	0.3	1.0	0.0	0.4
RCH.111	0.5	1.0	1.2	1.0	1.0	0.1	0.6
RCH.371	0.4	1.0	0.7	0.0	1.1	0.2	0.4
MRC.6100	0.3	1.0	0.7	0.0	1.0	0.0	0.3
MRC.7228X	0.2	1.0	0.7	0.0	1.0	0.1	0.3
MRC.7351X	0.5	0.0	0.7	0.0	1.0	0.0	0.1
NCS.145	0.6	0.0	1.0	0.7	1.0	0.0	0.3
NCS.207	0.2	1.0	1.3	1.3	1.0	0.0	0.6
NCS.913	0.7	1.0	1.7	2.7	1.0	0.0	1.1
DHANWAN	0.1	0.0	1.2	1.0	1.0	0.0	0.3
BRAHMA	0.4	1.0	1.5	1.7	1.0	0.0	0.8
KDCHH.9632	0.3	1.0	0.7	0.0	1.0	0.0	0.3
KDCHH.531X	0.4	1.0	0.7	0.0	1.0	0.0	0.4
KDCHH.441X	1.7	1.0	0.7	0.0	1.0	0.0	0.7
PRCH.101	0.5	1.0	0.7	0.0	1.0	0.0	0.4
PRCH.102	0.6	1.0	1.2	1.0	1.0	0.0	0.7
PRCH.103	0.4	1.0	0.9	0.3	1.0	0.0	0.4
NPH.2270	0.7	2.0	0.8	0.0	1.1	0.1	0.7
NPH.2171	1.3	1.0	1.3	1.3	1.0	0.1	0.9
NPH.2250	0.3	0.0	1.3	1.3	1.0	0.1	0.4
GK.207	0.7	1.0	0.9	0.3	1.0	0.1	0.5
GK.208	0.5	1.0	1.5	2.0	1.0	0.1	0.9
GK.209	0.6	0.0	0.9	0.3	1.0	0.1	0.2
TULASI.4	0.8	0.0	0.9	0.3	1.0	0.0	0.3
TULASI.117	0.1	0.0	0.7	0.0	1.0	0.0	0.0
RCH.2 Bt	0.7	0.0	1.0	0.7	1.0	0.1	0.4
MECH.162 Bt	0.4	1.0	0.7	0.0	1.1	0.1	0.4
BUNNY	0.3	1.0	1.3	1.3	1.1	0.1	0.7
CD (0.05)	0.1	NS		0.6		NS	
CV%	12.2	8.5		34.7		4.5	

Locule damage (%)

The percent locule damage was seen to be low in most of the hybrids. In some cases, it has been recorded at a range of 11.0 to 13.3 as given in bolded figures below. The check hybrid, Bunny recorded 15.5% locule damage. Some of the entries such as Bunny VIP, ACH-33-1, NPH.2250 (14.3%) recorded 13.3% locule damage.

Entry	Siruguppa	TNAU	Nandyal		Lam Guntur		Mean %
	%	%	*TV	%	TV	%	
NECH.2R	10.2	4.2	17.4	11.2	12.5	5.0	7.6
NECH.3R	9.7	4.2	8.2	2.7	11.3	4.1	5.2
Bunny VIP	13.0	0.0	30.8	26.6	12.9	5.5	11.3
2-62 VIP	11.5	0.0	15.6	9.0	11.0	3.7	6.1
2-42 VIP	9.7	4.0	29.2	22.6	7.2	2.8	9.8
JKCH.99	9.1	4.3	12.3	7.7	2.5	1.8	5.7
DURGA	10.8	3.2	23.6	16.1	7.7	2.8	8.2
ESWAR	16.6	0.0	11.6	4.4	10.6	3.7	6.2
ACH.11-1	13.2	3.0	22.4	14.6	10.3	3.3	8.5
ACH-21-1	6.5	0.0	22.5	18.4	11.5	4.2	7.3
ACH-33-1	11.3	2.0	37.2	36.9	7.6	3.0	13.3
RCH.524 X	8.6	7.5	13.4	7.3	13.3	5.5	7.2
RCH.111	7.6	5.1	16.6	10.2	4.7	1.3	6.1
RCH.371	8.7	3.0	23.9	16.4	9.4	2.9	7.7
MRC.6100	8.9	2.0	7.7	2.3	11.0	3.8	4.2
MRC.7228X	8.4	0.0	22.2	18.5	9.5	3.8	7.7
MRC.7351X	8.6	0.0	20.1	13.0	11.3	4.1	6.4
NCS.145	10.2	3.0	23.0	19.8	14.1	5.7	9.7
NCS.207	7.8	2.0	21.5	14.5	12.4	4.7	7.3
NCS.913	8.0	0.0	17.6	9.3	8.8	2.3	4.9
DHANWAN	10.3	1.5	18.5	11.3	9.9	3.2	6.6
BRAHMA	11.5	1.5	16.2	8.4	8.6	2.5	6.0
KDCHH.9632	11.2	2.0	15.6	8.1	9.9	3.2	6.1
KDCHH.531X	7.7	2.2	22.8	17.5	3.4	0.9	7.1
KDCHH.441X	7.3	2.0	20.7	17.0	11.2	4.0	7.6
PRCH.101	6.6	3.3	15.6	9.6	12.1	4.6	6.0
PRCH.102	11.2	1.0	17.1	8.7	8.3	2.2	5.8
PRCH.103	9.4	2.0	24.3	18.4	7.5	2.5	8.1
NPH.2270	7.4	1.0	12.9	6.9	8.0	1.9	4.3
NPH.2171	7.9	0.0	18.1	12.1	9.8	3.3	5.8
NPH.2250	10.4	4.0	38.8	39.9	9.4	2.8	14.3
GK.207	9.1	0.5	26.9	21.1	12.2	4.6	8.8
GK.208	10.8	0.0	36.1	35.0	7.9	2.9	12.2
GK.209	12.0	0.0	31.5	28.0	6.5	1.9	10.5
TULASI.4	6.9	0.0	12.7	5.7	11.4	4.0	4.2
TULASI.117	7.0	0.0	22.5	16.3	11.3	4.3	6.9
RCH.2 Bt	8.9	0.0	28.8	24.2	12.0	4.6	9.4
MECH.162 Bt	7.2	2.0	29.8	25.4	10.5	3.2	9.5
BUNNY	12.8	3.5	36.8	42.8	11.9	4.0	15.7
CD (0.05)	2.717	25.04		18.35		NS	
CV%	17	11.01		50.93		40	

* TV- transformed values

Open boll damage (%)

The Pink bollworm damage was indicated by the open boll damage measurements in these hybrids in this zone. The mean values are presented below. It is found that hybrids such as NRECH.2R and PRCH. 101 (11.1%) had high damage in comparison to Bt and non-Bt check hybrid. Other test hybrids also recorded higher than the Bunny check hybrid.

Entry	Siruguppa	TNAU	Nandyal		Lam Guntur		Dharwad	mean %
	%	%	*TV	%	TV	%	%	
NECH.2R	30.7	2.2	18.1	12.1	19.2	15.3	14.0	11.1
NECH.3R	32.7	3.2	8.3	2.8	12.9	10.9	11.0	5.2
Bunny VIP	36.4	0.0	30.2	25.8	18.2	19.5	17.6	8.3
2-62 VIP	37.6	0.0	15.2	8.4	15.5	13.9	13.3	7.3
2-42 VIP	34.2	2.0	27.4	21.4	13.0	17.0	15.7	5.2
JKCH.99	27.2	3.4	12.7	8.3	10.1	10.9	10.7	3.9
DURGA	28.0	1.1	24.0	16.6	16.0	15.3	13.4	7.7
ESWAR	37.0	0.0	12.2	4.7	15.9	12.9	12.4	8.0
ACH.11-1	30.8	3.3	22.8	15.1	16.3	15.8	14.3	8.1
ACH-21-1	35.9	0.0	23.0	19.2	16.3	16.9	15.8	8.1
ACH-33-1	30.7	2.1	41.1	43.4	13.4	22.4	20.5	5.9
RCH.524 X	31.1	3.0	13.8	7.9	17.8	13.7	12.9	9.5
RCH.111	37.6	4.0	17.1	10.8	9.0	13.6	13.8	2.7
RCH.371	32.4	2.0	24.3	17.0	13.5	15.6	14.2	5.5
MRC.6100	24.9	1.5	7.9	2.4	14.5	9.5	8.8	6.4
MRC.7228X	24.0	0.0	22.2	18.5	16.1	14.5	12.6	8.0
MRC.7351X	23.4	0.0	20.7	13.9	16.1	13.3	11.3	8.0
NCS.145	32.1	2.1	23.8	20.8	17.3	17.3	16.0	9.1
NCS.207	33.1	2.0	20.9	178.6	14.0	44.3	55.1	6.5
NCS.913	34.6	0.0	18.3	10.0	15.2	14.0	12.9	6.9
DHANWAN	33.8	0.5	18.4	11.1	13.5	13.7	12.8	5.7
BRAHMA	28.6	2.0	16.2	8.3	12.3	11.8	10.9	4.6
KDCHH.9632	36.0	1.5	15.0	7.8	12.4	12.8	12.5	4.7
KDCHH.531X	47.3	1.7	23.1	18.6	7.5	16.9	17.5	2.6
KDCHH.441X	31.6	2.0	21.0	17.2	17.1	16.1	14.9	8.8
PRCH.101	42.1	2.0	15.1	8.7	19.5	16.4	16.0	11.1
PRCH.102	31.3	2.0	17.4	8.9	14.9	13.4	12.2	6.8
PRCH.103	30.1	3.2	24.5	18.6	10.2	15.1	14.1	4.7
NPH.2270	30.8	1.0	12.9	6.8	13.3	11.6	11.0	5.4
NPH.2171	33.8	0.0	19.2	13.7	15.6	14.8	13.8	7.7
NPH.2250	34.0	1.0	40.4	42.4	15.1	23.0	21.0	6.9
GK.207	32.4	2.2	27.4	21.7	13.4	16.9	15.4	5.6
GK.208	31.2	0.0	38.1	38.3	11.5	20.6	18.9	6.1
GK.209	29.3	0.0	31.2	27.5	11.2	17.1	15.5	5.3
TULASI.4	26.0	0.0	13.9	7.0	14.2	10.1	8.5	1.2
TULASI.117	27.6	0.0	22.4	15.7	14.7	14.2	12.5	6.8
RCH.2 Bt	31.0	0.0	29.5	25.3	18.4	18.7	16.6	10.2
MECH.162 Bt	24.9	2.2	29.8	25.1	14.0	16.7	14.6	6.1
BUNNY	33.4	1.5	36.5	42.2	13.8	22.0	20.7	5.7
CD (0.05)	8.63	1.18		18.89			NS	
CV%	16.75	169.16		51.57			33.6	

* TV-transformed values

Number of sprays undertaken under PROTECTED conditions

Most of the hybrids needed 3.5 to 4.0 sprayings of insecticides to counter the sap sucking pests in breeding evaluation. These hybrids were seen to be susceptible to various sap sucking pests and demanded protection at various phenological stages.

Entry	Siruguppa			TNAU			Nandyal			Lam Guntur			Mean		
	SP#	BW*	total	SP	BW	Total	SP	BW	total	SP	BW	total	SP	BW	total
NECH.2R	3	2	5	2	-	2	4	0	4	0	2	2	2.3	1.3	3.3
NECH.3R	3	2	5	1	-	1	4	2	6	0	2	2	2.0	2.0	3.5
Bunny VIP	3	2	5	1	-	1	4	3	7	0	2	2	2.0	2.3	3.8
2-62 VIP	3	2	5	2	-	2	4	3	7	0	1	1	2.3	2.0	3.8
2-42 VIP	3	2	5	1	-	1	4	1	5	1	4	5	2.3	2.3	4.0
JKCH.99	3	2	5	1	-	1	4	1	5	0	2	2	2.0	1.7	3.3
DURGA	3	2	5	1	-	1	4	1	5	0	1	1	2.0	1.3	3.0
ESWAR	3	2	5	1	-	1	4	0	4	0	3	3	2.0	1.7	3.3
ACH.11-1	3	2	5	2	-	2	4	3	7	0	5	5	2.3	3.3	4.8
ACH-21-1	3	2	5	1	-	1	4	2	6	0	1	1	2.0	1.7	3.3
ACH-33-1	3	2	5	1	-	1	4	0	4	0	2	2	2.0	1.3	3.0
RCH.524 X	3	2	5	1	-	1	4	3	7	0	1	1	2.0	2.0	3.5
RCH.111	3	2	5	2	-	2	4	1	5	1	1	2	2.5	1.3	3.5
RCH.371	3	2	5	1	-	1	4	1	5	0	2	2	2.0	1.7	3.3
MRC.6100	3	2	5	1	-	1	4	2	6	0	1	1	2.0	1.7	3.3
MRC.7228X	3	2	5	2	-	2	4	2	6	0	1	1	2.3	1.7	3.5
MRC.7351X	3	2	5	2	-	2	4	1	5	0	2	2	2.3	1.7	3.5
NCS.145	3	2	5	1	-	1	4	3	7	0	3	3	2.0	2.7	4.0
NCS.207	3	2	5	1	-	1	4	1	5	0	4	4	2.0	2.3	3.8
NCS.913	3	2	5	2	-	2	4	1	5	0	1	1	2.3	1.3	3.3
DHANWAN	3	2	5	2	-	2	4	1	5	1	2	3	2.5	1.7	3.8
BRAHMA	3	2	5	1	-	1	4	3	7	0	2	2	2.0	2.3	3.8
KDCHH.9632	3	2	5	1	-	1	4	2	6	0	2	2	2.0	2.0	3.5
KDCHH.531X	3	2	5	1	-	1	4	2	6	0	2	2	2.0	2.0	3.5
KDCHH.441X	3	2	5	2	-	2	4	1	5	1	2	3	2.5	1.7	3.8
PRCH.101	3	2	5	2	-	2	4	1	5	0	1	1	2.3	1.3	3.3
PRCH.102	3	2	5	1	-	1	4	1	5	0	1	1	2.0	1.3	3.0
PRCH.103	3	2	5	1	-	1	4	2	6	0	1	1	2.0	1.7	3.3
NPH.2270	3	2	5	1	-	1	4	2	6	1	1	2	2.3	1.7	3.5
NPH.2171	3	2	5	1	-	1	4	2	6	1	3	4	2.3	2.3	4.0
NPH.2250	3	2	5	1	-	1	4	2	6	1	3	4	2.3	2.3	4.0
GK.207	3	2	5	1	-	1	4	2	6	0	2	2	2.0	2.0	3.5
GK.208	3	2	5	1	-	1	4	0	4	0	1	1	2.0	1.0	2.8
GK.209	3	2	5	1	-	1	4	3	7	1	4	5	2.3	3.0	4.5
TULASI.4	3	2	5	1	-	1	4	3	7	0	1	1	2.0	2.0	3.5
TULASI.117	3	2	5	1	-	1	4	0	4	0	1	1	2.0	1.0	2.8
RCH.2 Bt	3	2	5	1	-	1	4	0	4	1	1	2	2.3	1.0	3.0
MECH.162 Bt	3	2	5	1	-	1	4	2	6	0	4	4	2.0	2.7	4.0
BUNNY	3	2	5	1	-	1	4	2	6	0	2	2	2.0	2.0	3.5

#SP-sucking pests, * BW-Bollworms

PLANT PROTECTION EVALUATION- Unprotected Condition

Jassids (average of 3 leaves/plant)

The mean Jassid incidence, under unprotected condition was assessed in the zone in the 37 test hybrids and given below. All the test hybrids were susceptible to this pest.

Entry	Siruguppa	TNAU	Nandyal		Lam Guntur		Dharwad	Mean Number
	Number	Number	*TV	Number	TV	Number	Number	
NECH.2R	2.4	6.4	2.2	4.5	2.5	5.5	1.7	4.7
NECH.3R	1.7	6.5	2.5	5.7	2.3	4.3	1.9	4.5
Bunny VIP	2.8	6.9	3.0	8.5	2.3	4.3	1.5	5.6
2-62 VIP	1.7	8.0	3.2	10.3	2.9	7.7	0.9	6.9
2-42 VIP	2.3	7.1	2.9	8.5	2.9	7.9	2.0	6.5
JKCH.99	2.8	8.6	2.6	7.0	3.0	7.9	1.2	6.6
DURGA	2.0	7.1	2.6	6.5	2.5	5.3	0.6	5.2
ESWAR	1.6	6.4	3.1	8.9	2.3	4.7	1.5	5.4
ACH.11-1	1.2	7.2	2.1	4.1	2.2	3.7	0.9	4.0
ACH-21-1	1.0	8.6	2.1	3.7	2.4	5.0	1.2	4.6
ACH-33-1	1.3	7.3	2.3	4.9	2.6	5.7	0.2	4.8
RCH.524 X	1.9	6.3	1.9	3.7	2.9	7.7	0.2	4.9
RCH.111	1.5	8.2	2.3	4.9	3.0	8.1	0.6	5.7
RCH.371	1.6	7.6	2.5	5.7	2.8	6.7	0.3	5.4
MRC.6100	2.0	8.6	2.0	3.9	2.5	5.1	0.5	4.9
MRC.7228X	1.8	6.2	1.9	3.3	2.7	6.6	0.2	4.5
MRC.7351X	1.3	9.2	1.9	3.3	2.6	5.9	0.6	4.9
NCS.145	0.9	9.5	2.1	3.8	2.5	5.3	1.0	4.9
NCS.207	1.8	7.4	2.5	6.2	2.7	6.2	0.5	5.4
NCS.913	2.6	7.1	3.6	12.2	2.7	6.1	0.2	7.0
DHANWAN	2.4	7.6	2.5	6.0	2.6	5.8	0.1	5.4
BRAHMA	1.5	8.6	2.4	5.4	2.5	5.1	0.2	5.1
KDCHH.9632	2.3	9.1	2.0	4.0	2.4	4.9	0.1	5.1
KDCHH.531X	1.5	7.1	2.3	4.8	2.4	4.7	0.2	4.5
KDCHH.441X	1.3	6.2	2.1	4.5	2.6	5.8	0.3	4.4
PRCH.101	2.2	8.1	2.4	5.9	2.7	4.4	0.3	5.1
PRCH.102	1.9	7.4	2.7	7.7	2.8	6.7	0.6	5.9
PRCH.103	1.1	6.1	2.4	5.1	2.5	5.5	0.3	4.5
NPH.2270	2.1	7.2	3.1	9.1	2.7	6.4	0.5	6.2
NPH.2171	2.3	6.8	2.9	7.8	2.7	6.8	0.4	5.9
NPH.2250	2.2	8.1	2.7	8.5	2.7	6.5	0.3	6.3
GK.207	1.9	6.2	2.5	5.6	2.6	6.1	0.8	4.9
GK.208	3.1	8.1	2.1	4.3	2.7	6.5	0.3	5.5
GK.209	0.9	8.6	3.0	8.5	2.4	4.9	0.3	5.7
TULASI.4	2.0	8.1	2.8	7.3	2.5	5.3	0.2	5.7
TULASI.117	2.5	9.1	2.8	8.5	3.1	8.9	0.5	7.2
RCH.2 Bt	3.3	6.3	3.0	8.7	3.3	9.9	0.3	7.0
MECH.162 Bt	1.9	8.3	2.6	6.5	2.8	7.1	0.5	5.9
BUNNY	1.7	6.2	1.8	2.7	2.6	6.2	0.7	4.2
CD (0.05)	0.582	6.2		0.96		0.055	0.22	
CV%	15.22	1.8		23.11		13	18.97	

*TV-transformed values

Thrips (average of 3 leaves/plant)

The mean thrips population, under unprotected condition was assessed in the zone in the 37 test hybrids and given below. All the hybrids were seen to be susceptible to this pest.

Entry	TNAU	Nandyal		Lam Guntur		Dharwad	Mean Number
	Number	*TV	Number	TV	Number	Number	
NECH.2R	2.3	5.1	25.5	4.8	2.3	19.8	12.5
NECH.3R	1.0	5.2	26.7	4.9	24.7	31.3	20.9
Bunny VIP	1.8	4.0	15.3	5.5	29.9	28.6	18.9
2-62 VIP	3.2	4.9	24.1	4.7	19.7	35.5	20.6
2-42 VIP	1.8	3.7	13.5	3.1	10.0	29.9	13.8
JKCH.99	1.0	4.8	22.4	4.6	20.3	34.7	19.6
DURGA	1.8	4.0	15.6	4.2	25.4	37.6	20.1
ESWAR	2.5	4.6	20.4	5.6	30.4	35.2	22.1
ACH.11-1	3.2	5.0	25.7	5.0	24.1	42.2	23.8
ACH-21-1	1.5	5.4	28.9	5.2	26.9	35.5	23.2
ACH-33-1	1.5	5.9	34.5	4.8	22.9	35.6	23.6
RCH.524 X	2.2	5.7	32.2	5.3	27.5	34.7	24.1
RCH.111	3.5	5.1	25.6	4.6	20.9	31.7	20.4
RCH.371	1.3	5.9	34.8	5.3	28.0	40.0	26.0
MRC.6100	1.0	5.4	29.7	2.7	6.1	37.0	18.5
MRC.7228X	1.3	5.8	32.9	3.6	13.3	41.2	22.2
MRC.7351X	1.8	6.5	42.3	4.2	18.8	27.1	22.5
NCS.145	2.5	4.3	18.6	5.0	24.4	33.4	19.7
NCS.207	1.8	4.3	50.0	4.8	22.5	35.8	27.5
NCS.913	0.8	7.4	19.3	4.6	20.2	35.9	19.0
DHANWAN	1.3	5.4	20.9	3.5	12.1	38.4	18.1
BRAHMA	1.0	4.8	22.6	4.0	15.7	39.8	19.8
KDCHH.9632	2.0	4.8	23.1	5.2	27.0	39.4	22.9
KDCHH.531X	1.5	5.8	32.7	3.5	12.5	33.9	20.1
KDCHH.441X	1.0	4.5	20.7	1.9	3.0	35.8	15.1
PRCH.101	1.2	4.6	21.2	4.8	22.7	23.9	17.3
PRCH.102	1.3	3.9	15.2	4.4	20.5	30.7	16.9
PRCH.103	2.2	4.8	22.7	5.4	28.8	38.7	23.1
NPH.2270	1.2	4.7	21.7	4.2	17.8	38.0	19.7
NPH.2171	1.5	4.4	19.4	4.2	18.0	32.2	17.8
NPH.2250	1.0	4.0	15.9	3.5	11.1	32.2	15.0
GK.207	2.1	5.1	25.6	5.1	25.5	26.7	20.0
GK.208	1.4	4.6	20.9	5.2	27.3	38.8	22.1
GK.209	0.1	5.2	27.2	4.8	21.9	29.3	19.6
TULASI.4	2.0	5.5	26.1	5.0	24.7	36.0	22.2
TULASI.117	0.3	4.1	16.5	3.8	13.9	37.9	17.2
RCH.2 Bt	0.3	4.6	20.3	4.3	18.3	33.0	18.0
MECH.162 Bt	0.5	5.6	31.0	5.9	30.8	32.5	23.7
BUNNY	2.0	5.2	26.7	4.8	22.5	42.8	23.5
CD (0.05)	2.2		1.11		1.25	1.35	
CV%	1.5		13.96		17.4	11.74	

*TV-transformed values

The mean whitefly population in the zone in the 36 test hybrids and given below. All the hybrids were seen to be susceptible to this pest. The population of whitefly was quite low in 2004 season in this zone.

The Spotted bollworm was sporadic in this zone. However, they were seen to infest the Bt test hybrids, as seen below.

Entry	Whitefly (average of 3 leaves/plant)					Spotted Bollworm			
	TNAU	Nandyal		Lam Guntur		Mean number	TNAU	Dharwad	Mean number
	number	*TV	Number	TV	Number		Number	Number	
NECH.2R	8.4	3.2	9.6	1.9	2.7	6.9	2.0	0.0	1.0
NECH.3R	9.8	2.8	7.8	2.1	3.5	7.0	1.0	1.0	1.0
Bunny VIP	7.4	3.0	9.3	1.2	3.1	6.6	0.0	2.0	1.0
2-62 VIP	10.4	3.4	11.6	1.6	1.9	8.0	0.0	0.0	0.0
2-42 VIP	8.2	2.6	6.6	1.7	1.8	5.5	1.0	0.0	0.5
JKCH.99	7.4	2.4	5.4	1.9	2.5	5.1	1.0	0.5	0.8
DURGA	8.2	2.5	5.9	1.6	1.6	5.2	0.0	0.5	0.3
ESWAR	9.2	2.7	7.0	1.6	1.7	6.0	0.0	0.5	0.3
ACH.11-1	10.0	3.5	12.4	1.9	2.8	8.4	1.0	1.1	1.1
ACH-21-1	8.2	3.8	14.4	2.1	3.6	8.7	0.0	0.0	0.0
ACH-33-1	6.2	3.6	13.4	2.1	3.6	7.7	1.0	1.0	1.0
RCH.524 X	8.4	2.6	6.8	1.5	1.4	5.5	1.0	1.0	1.0
RCH.111	8.2	3.3	10.3	1.8	2.5	7.0	1.0	0.5	0.8
RCH.371	8.6	3.5	12.0	2.0	2.8	7.8	0.0	1.0	0.5
MRC.6100	10.2	3.0	9.4	2.8	7.7	9.1	0.0	0.5	0.3
MRC.7228X	10.4	3.6	12.2	1.9	2.5	8.4	0.0	1.5	0.8
MRC.7351X	11.8	3.5	11.6	2.4	4.5	9.3	0.0	0.0	0.0
NCS.145	10.2	3.0	9.0	2.2	4.6	7.9	1.0	1.0	1.0
NCS.207	9.8	3.1	9.2	1.7	2.0	7.0	1.0	0.0	0.5
NCS.913	8.2	2.7	6.8	1.7	2.1	5.7	0.0	0.0	0.0
DHANWAN	8.4	3.2	10.8	2.0	3.0	7.4	0.0	0.0	0.0
BRAHMA	9.2	3.4	10.8	2.0	3.1	7.7	0.0	0.5	0.3
KDCHH.9632	10.2	2.8	7.4	1.9	2.6	6.7	0.0	0.0	0.0
KDCHH.531X	9.2	3.2	10.4	1.4	1.1	6.9	1.0	1.0	1.0
KDCHH.441X	8.4	3.6	14.0	1.9	2.5	8.3	0.0	0.0	0.0
PRCH.101	8.2	2.8	7.6	1.8	2.2	6.0	1.0	0.0	0.5
PRCH.102	8.2	2.7	6.8	1.5	1.3	5.4	0.0	1.0	0.5
PRCH.103	9.2	2.0	6.6	1.8	2.5	6.1	1.0	0.5	0.8
NPH.2270	9.4	3.1	7.0	1.7	2.0	6.1	0.0	0.5	0.3
NPH.2171	9.3	2.5	5.6	1.6	1.7	5.5	0.0	0.0	0.0
NPH.2250	9.8	2.4	5.2	1.6	1.7	5.6	1.0	1.0	1.0
GK.207	9.2	3.1	9.4	2.1	3.3	7.3	0.0	0.5	0.3
GK.208	8.4	3.4	11.6	1.6	1.6	7.2	0.0	1.3	0.6
GK.209	4.2	14.0	15.7	1.6	1.6	7.2	0.0	0.5	0.3
TULASI.4	9.8	2.7	7.0	1.8	2.4	6.4	0.0	0.5	0.3
TULASI.117	9.8	3.1	9.2	1.7	1.9	7.0	0.0	0.0	0.0
RCH.2 Bt	10.2	2.4	5.6	1.8	2.3	6.0	0.0	0.5	0.3
MECH.162 Bt	9.8	3.2	10.2	1.6	1.8	7.3	0.0	0.5	0.3
BUNNY	8.5	3.4	11.4	2.3	4.9	8.3	1.0	0.0	0.5
CD (0.05)	2.22	0.99	0.99		0.57		NS	0.11	
CV%	7.1	19.96	19.96		19.3		8.83	3.5	

*TV-transformed values

American bollworm

The American bollworm incidence was quite negligible under unsprayed conditions too in this zone during 2004 season and hence proper assessment of the reaction of these 37 hybrids could not be undertaken. The following data shows the poor incidence in this zone.

Entry	Siruguppa	TNAU	Nandyal		Lam Guntur		Dharwad	Mean Number/plant
	Number/plant	Number/Plant	*TV	Number/Plant	TV	Number/Plant	Number/plant	
NECH.2R	0.6	1.0	0.7	0.0	1.0	0.0	1.0	0.5
NECH.3R	0.5	2.0	1.2	1.0	1.0	0.3	0.0	0.8
Bunny VIP	0.8	0.0	0.7	0.0	1.0	0.0	1.0	0.4
2-62 VIP	0.1	0.0	0.7	0.0	1.1	0.7	4.0	1.0
2-42 VIP	0.7	1.0	1.0	0.7	1.0	0.0	1.6	0.8
JKCH.99	0.5	0.0	1.0	0.7	1.0	0.0	0.5	0.3
DURGA	0.3	1.0	1.2	1.3	1.0	0.0	0.0	0.5
ESWAR	0.4	0.0	0.9	0.3	1.1	0.7	0.0	0.3
ACH.11-1	0.6	2.0	0.9	0.3	1.1	0.7	1.1	0.9
ACH-21-1	0.3	0.0	1.0	0.7	1.1	0.7	2.0	0.7
ACH-33-1	0.5	1.0	1.3	2.0	1.0	0.0	1.0	0.9
RCH.524 X	0.8	2.0	0.7	0.0	1.0	0.3	0.5	0.7
RCH.111	0.1	1.0	0.9	0.3	1.1	1.0	1.0	0.7
RCH.371	0.7	0.0	1.1	0.7	1.0	0.0	1.5	0.6
MRC.6100	0.4	1.0	1.2	1.0	1.0	0.3	2.0	0.9
MRC.7228X	0.5	0.0	1.3	1.3	1.0	0.3	2.5	0.9
MRC.7351X	0.6	2.0	1.1	0.7	1.0	0.3	2.5	1.2
NCS.145	0.5	1.0	0.7	0.0	1.0	0.0	0.5	0.4
NCS.207	0.4	0.0	1.4	1.7	1.0	0.0	0.5	0.5
NCS.913	0.6	0.0	0.7	0.0	1.0	0.0	2.0	0.5
DHANWAN	0.3	1.0	0.7	0.0	1.0	0.0	0.5	0.4
BRAHMA	0.5	0.0	0.9	0.3	1.0	0.0	2.0	0.6
KDCHH.9632	0.8	1.0	0.2	1.0	1.0	0.0	2.8	1.1
KDCHH.531X	0.1	1.0	1.3	1.3	1.0	0.0	1.8	0.8
KDCHH.441X	0.3	1.0	1.0	0.7	1.0	0.3	2.0	0.9
PRCH.101	0.4	1.0	1.0	0.7	1.0	0.0	1.0	0.6
PRCH.102	0.5	1.0	1.0	0.7	1.0	0.3	1.0	0.7
PRCH.103	0.2	1.0	1.3	1.3	1.0	0.0	2.0	0.9
NPH.2270	0.6	2.0	1.1	0.7	1.1	0.7	2.0	1.2
NPH.2171	0.9	0.0	0.9	0.3	1.0	0.0	2.0	0.6
NPH.2250	0.3	1.0	1.0	0.7	1.0	0.3	3.3	1.1
GK.207	0.7	1.0	0.7	0.0	1.0	0.3	3.1	1.0
GK.208	0.4	0.0	1.3	1.3	1.0	0.0	1.6	0.7
GK.209	0.2	0.0	0.9	0.3	1.0	0.3	1.5	0.5
TULASI.4	0.5	0.0	1.8	3.3	1.0	0.0	1.0	1.0
TULASI.117	0.4	0.0	0.7	0.0	1.0	0.3	0.5	0.2
RCH.2 Bt	0.3	0.0	0.7	0.0	1.0	0.0	1.0	0.3
MECH.162 Bt	0.1	0.0	0.7	0.0	1.1	0.7	3.0	0.8
BUNNY	0.7	1.0	0.7	0.0	1.1	0.7	4.0	1.3
CD (0.05)	0.11	NS		0.67		NS	0.27	
CV%	14.44	10.66		42.95		4.8	6.18	

*TV-transformed values

Locule damage (%)

Under unprotected conditions, the locule damage was quite high, as indicated in the following table. The gene action was amiss in these test hybrids and Pink bollworm damage was high; it may be noted that the Spotted and American bollworms were very low in population during this season.

Entry	Siruguppa	TNAU	Nandyal		Lam Guntur		Dharwad	Mean %
	%	%	*TV	%	TV	%	%	
NECH.2R	10.2	7.2	18.5	12.9	12.0	4.7	10.2	9.0
NECH.3R	9.7	9.2	21.9	13.9	7.5	2.3	13.3	9.7
Bunny VIP	13.0	2.5	24.9	22.7	15.9	9.2	12.3	11.9
2-62 VIP	11.5	0.0	17.0	8.8	6.0	2.9	22.0	9.0
2-42 VIP	9.7	9.2	21.8	14.2	16.3	8.1	19.3	12.1
JKCH.99	13.1	8.3	25.8	24.4	10.8	3.7	8.1	11.5
DURGA	9.0	7.2	17.7	9.4	10.5	3.3	8.0	7.4
ESWAR	9.4	0.0	24.1	19.0	11.2	3.9	13.8	9.2
ACH.11-1	11.3	8.4	15.5	9.9	11.8	4.4	16.0	10.0
ACH-21-1	13.7	0.0	36.7	35.7	11.7	5.8	18.3	14.7
ACH-33-1	7.9	6.2	26.9	21.3	12.0	4.7	13.2	10.6
RCH.524 X	11.9	9.5	24.4	18.4	8.3	3.0	10.1	10.6
RCH.111	8.9	9.2	31.1	31.1	11.1	4.0	7.9	12.2
RCH.371	16.7	5.2	17.9	10.5	9.8	2.9	9.5	8.9
MRC.6100	13.0	4.7	30.0	26.6	6.5	1.9	10.4	11.3
MRC.7228X	9.7	0.0	17.8	11.5	9.4	3.9	13.5	7.7
MRC.7351X	10.8	0.0	24.2	21.1	6.1	1.7	9.4	8.6
NCS.145	12.0	9.3	23.3	16.1	10.6	3.5	13.9	11.0
NCS.207	14.6	4.1	22.8	15.6	7.1	2.3	10.6	9.4
NCS.913	8.6	0.0	24.9	18.1	8.3	3.0	10.6	8.1
DHANWAN	12.6	2.4	21.2	14.1	8.0	2.9	13.0	9.0
BRAHMA	12.0	3.5	24.6	19.9	9.2	2.8	15.7	10.8
KDCHH.9632	14.2	6.0	25.7	19.0	9.2	2.3	12.7	10.8
KDCHH.531X	11.3	7.3	20.6	12.6	7.7	2.6	6.5	8.0
KDCHH.441X	14.6	4.2	31.7	29.1	8.7	2.4	10.2	12.1
PRCH.101	15.1	9.3	28.4	24.1	9.9	3.1	12.7	12.9
PRCH.102	11.0	3.5	20.1	15.6	7.4	2.5	10.8	8.7
PRCH.103	15.2	4.1	19.1	11.9	11.0	3.7	8.1	8.6
NPH.2270	12.0	3.2	17.4	11.2	14.1	6.7	7.9	8.2
NPH.2171	6.9	0.0	28.2	22.4	13.0	5.7	14.1	9.8
NPH.2250	8.4	7.2	50.6	59.2	15.2	7.6	25.5	21.6
GK.207	10.3	2.2	23.3	16.2	12.7	5.1	11.8	9.1
GK.208	12.2	0.0	24.6	18.2	15.3	7.4	11.3	9.8
GK.209	13.6	0.0	12.6	8.1	10.0	3.2	8.7	6.7
TULASI.4	12.6	0.0	20.3	12.6	7.1	2.3	14.2	8.3
TULASI.117	18.3	0.0	20.3	17.8	14.1	6.2	11.1	10.7
RCH.2 Bt	11.2	0.0	24.3	17.8	8.5	3.8	11.7	8.9
MECH.162 Bt	13.7	9.7	21.2	16.6	13.3	5.4	20.0	13.1
BUNNY	13.3	9.2	51.7	61.3	14.9	6.6	31.1	24.3
CD (0.05)	3.04	3.4		26.83		NS	1.01	
CV%	15.83	9.8		28.05		46.8	4.21	

*TV-transformed values

The bolded rows provide the indication of poor gene action in reducing the Pink bollworm damage below desirable levels.

Open boll damage (%)

The Pink bollworm damage, indicating open boll damage also shows that most of these hybrids in this zone did not have gene action to reduce this damage due to Pink bollworm. The percent open boll damage was ranging between 13.1 to 29.8% in test hybrids. The check non-Bt hybrid had 26.7%.

Entry	Siruguppa	TNAU	Nandyal		Lam Guntur		Dharwad	Mean %
	%	%	*TV	%	TV	%	%	
NECH.2R	44.6	4.5	17.9	12.0	14.7	6.7	9.9	15.5
NECH.3R	42.7	6.4	22.2	14.0	16.5	8.2	12.2	16.7
Bunny VIP	36.0	0.0	24.9	22.6	18.1	11.3	16.7	17.3
2-62 VIP	45.7	0.0	17.5	9.3	7.8	3.1	11.5	13.9
2-42 VIP	43.7	6.2	22.2	14.8	23.2	15.5	14.6	19.0
JKCH.99	38.3	7.4	25.7	24.3	17.0	8.8	8.9	17.5
DURGA	36.3	4.2	17.5	9.4	13.7	5.8	10.6	13.2
ESWAR	46.4	2.0	24.5	19.2	13.7	6.4	6.6	16.1
ACH.11-1	65.8	8.3	15.7	10.2	14.2	8.2	9.9	20.5
ACH-21-1	51.3	0.0	40.0	41.5	16.6	8.3	5.9	21.4
ACH-33-1	58.4	5.2	26.3	20.5	15.7	6.6	6.7	19.4
RCH.524 X	44.8	7.9	24.5	18.5	14.6	6.5	10.1	17.5
RCH.111	41.0	7.4	35.6	34.8	13.7	6.8	6.9	19.4
RCH.371	57.2	3.2	18.0	10.5	14.7	7.1	7.4	17.1
MRC.6100	39.2	2.5	30.3	26.9	15.2	2.6	3.2	14.9
MRC.7228X	32.8	0.0	18.3	12.6	7.8	11.0	2.7	11.8
MRC.7351X	46.1	0.0	24.3	21.4	17.7	3.7	3.7	15.0
NCS.145	37.8	4.7	23.4	16.2	10.2	6.0	3.9	13.7
NCS.207	41.9	5.9	21.8	14.5	14.2	4.8	7.9	15.0
NCS.913	42.1	0.0	25.1	18.4	12.0	4.8	11.0	15.3
DHANWAN	44.6	3.0	20.7	13.6	12.1	4.4	9.8	15.1
BRAHMA	34.8	4.0	25.1	20.3	9.9	2.7	13.1	15.0
KDCHH.9632	45.3	2.5	25.9	19.2	9.3	4.1	0.0	14.2
KDCHH.531X	34.9	2.7	20.7	12.7	11.4	6.0	9.1	13.1
KDCHH.441X	39.9	6.3	32.1	29.7	13.3	4.7	11.9	18.5
PRCH.101	38.7	6.2	29.3	25.7	15.5	9.2	12.6	18.5
PRCH.102	52.3	4.8	26.6	20.9	17.0	3.9	15.3	19.4
PRCH.103	46.7	6.5	19.4	12.2	9.3	8.4	9.9	16.7
NPH.2270	62.2	1.9	18.1	12.1	16.7	8.5	8.5	18.6
NPH.2171	54.0	1.0	28.2	22.4	19.9	16.5	5.9	20.0
NPH.2250	44.0	6.0	50.7	59.4	22.5	15.1	24.7	29.8
GK.207	54.5	4.2	23.0	15.8	15.7	7.6	4.4	17.3
GK.208	43.3	3.8	24.8	18.4	20.5	12.3	11.2	17.8
GK.209	49.4	0.0	12.7	8.3	20.5	12.5	4.1	14.9
TULASI.4	51.4	0.0	20.1	12.3	13.7	6.2	6.0	15.2
TULASI.117	54.1	0.0	19.5	16.1	18.0	9.9	4.3	16.9
RCH.2 Bt	38.4	0.0	21.6	14.3	17.0	9.2	6.9	13.8
MECH.162 Bt	43.8	7.7	21.2	16.6	16.5	8.1	6.8	16.6
BUNNY	37.0	5.7	53.0	63.2	20.6	12.4	15.1	26.7
CD (0.05)	7.99	2.2		20.37	NS	NS	1.57	
CV%	10.8	11.5		48.31	38.5	38.5	4.48	

*TV-transformed values

The seed cotton yield under unprotected conditions was seen to be drastically less than that under protected conditions. The highest seed cotton yield was recorded in MRC.7228X (2398 kg/ha) and MRC.7351X (2392 kg/ha). MRC.6100 recorded (2048 kg/ha) seed cotton.

Seed Cotton Yield (Unprotected)

Entry	Siruguppa	TNAU	Nandyal	Lam Guntur	Dharwad	Mean
NECH.2R	1411	1874	903	2425	1303	1583
NECH.3R	1626	1400	812	1968	1261	1413
Bunny VIP	748	1891	217	1280	1263	1080
2-62 VIP	673	1704	377	1072	1433	1052
2-42 VIP	251	1886	160	959	1281	907
JKCH.99	218	1333	423	1958	1784	1143
DURGA	184	1867	412	1824	1351	1128
ESWAR	243	2346	423	1662	1194	1173
ACH.11-1	197	1832	526	1728	1117	1080
ACH-21-1	640	2565	400	1774	1392	1354
ACH-33-1	425	2528	492	1735	1292	1294
RCH.524 X	336	1160	709	2758	2357	1464
RCH.111	215	1657	553	1890	1719	1207
RCH.371	844	1620	594	2236	2211	1501
MRC.6100	2174	2239	1155	1906	2764	2048
MRC.7228X	2725	2420	1406	2935	2475	2392
MRC.7351X	2491	2610	1246	3190	2306	2369
NCS.145	1653	1753	915	2816	1121	1652
NCS.207	1578	2064	617	2788	1124	1634
NCS.913	1843	2309	274	1896	1685	1601
DHANWAN	978	2160	663	1789	1724	1463
BRAHMA	1759	2109	1155	2884	1692	1920
KDCHH.9632	849	1753	423	1507	898	1086
KDCHH.531X	1583	1832	709	2325	1631	1616
KDCHH.441X	1141	1484	594	2491	2047	1552
PRCH.101	419	1123	686	1918	1289	1087
PRCH.102	377	1778	434	1510	905	1001
PRCH.103	678	1679	286	2055	1573	1254
NPH.2270	276	1694	274	1612	1400	1051
NPH.2171	205	1951	286	1517	1464	1085
NPH.2250	147	1756	263	1211	548	785
GK.207	835	1938	640	1708	1892	1403
GK.208	475	1790	540	2094	1711	1322
GK.209	945	2259	494	1627	1441	1353
TULASI.4	1199	1714	423	1574	1117	1205
TULASI.117	983	1963	469	1422	1114	1190
RCH.2 Bt	991	2200	434	1759	1484	1374
MECH.162 Bt	860	1978	469	1736	1395	1288
BUNNY	597	1899	117	1827	513	991
CD 0.05	296	447	288	801	90	
CV%	20	15	31	26	6	

The yield in protected plots was far superior to the entries in unprotected conditions. The following table provides the mean seed cotton yield under both the conditions. It is seen that these Bt hybrids need insecticide support to provide appreciable seed cotton yield in this zone.

Mean seed cotton yield under both protected and unprotected conditions

Entry	Mean Yield under protected condition (kg/ha)	Mean Yield under unprotected condition (kg/ha)
NECH.2R	1969	1583
NECH.3R	1976	1413
Bunny VIP	1420	1080
2-62 VIP	1257	1052
2-42 VIP	1382	907
JKCH.99	1879	1143
DURGA	1626	1128
ESWAR	1391	1173
ACH.11-1	1722	1080
ACH-21-1	1990	1354
ACH-33-1	1973	1294
RCH.524 X	1807	1464
RCH.111	1910	1207
RCH.371	2120	1501
MRC.6100	2186	2048
MRC.7228X	2637	2392
MRC.7351X	2692	2369
NCS.145	1968	1652
NCS.207	1834	1634
NCS.913	1782	1601
DHANWAN	1599	1463
BRAHMA	2105	1920
KDCHH.9632	1777	1086
KDCHH.531X	1877	1616
KDCHH.441X	1490	1552
PRCH.101	1593	1087
PRCH.102	1564	1001
PRCH.103	1758	1254
NPH.2270	1506	1051
NPH.2171	1215	1085
NPH.2250	1092	785
GK.207	1704	1403
GK.208	2159	1322
GK.209	1970	1353
TULASI.4	1595	1205
TULASI.117	1248	1190
RCH.2 Bt	1779	1374
MECH.162 Bt	1585	1288
BUNNY	1336	991

PLANT PATHOLOGY EVALUATION

The 37 Bt test hybrids along with two Bt and one non-Bt checks were evaluated during this year (2004 - 05) for their reaction against *Alternaria* leaf spot and Grey mildew in the Dharwad, Siruguppa, Lam (Guntur) and Coimbatore centres; against bacterial blight at Dharwad and Siruguppa and against *Helminthosporium* and *Cercospora* leaf spots at Lam.

Alternaria leaf spot

There was very severe incidence of this disease at the Dharwad and Siruguppa centres and all the forty hybrids were found susceptible to this disease (Grade 4). In the Lam centre, there was moderate disease incidence viz., 11.33 to 21.66 per cent in the breeding trials and 17.00 to 30.60 per cent in the entomology trials. In the Coimbatore trials, few hybrids viz., NECH 2R, NECH 4R, JKCH 99, ESWAR, NCS 145, BRAHMA and NPH 2171 did not show any symptoms of the disease under in both breeding and Plant protection evaluations, as seen below.

Alternaria leaf spot disease (Percent Disease Incidence)

Name of entry	Dharwad		Siruguppa		Coimbatore				LAM	
	P	UP	P	UP	Protected		Unprotected		Protected	Unprotected
					Grade	PDI	Grade	PDI		
NECH.2R	4	4	4	4	0	0.00	0	0.00	18.33 (25.32)	25.66 (30.41)
NECH.3R	4	4	4	4	0	0.00	2	20.00	15.66 (23.25)	22.33 (28.15)
Bunny VIP	3	4	4	4	2	22.50	1	13.75	13.0 (20.93)	18.0 (24.94)
2-62 VIP	4	4	4	4	1	11.25	0	0.00	15.33 (22.98)	26.66 (27.68)
2-42 VIP	3	4	4	4	1	7.50	2	18.75	11.33 (19.56)	15.66 (23.3)
JKCH.99	4	4	3	4	0	0.00	0	0.00	13.66 (21.43)	18.66 (25.57)
DURGA	3	4	4	4	2	26.25	1	13.75	15.33 (22.84)	19.33 (26.04)
ESWAR	3	4	4	4	0	0.00	0	0.00	11.66 (19.83)	17 (24.33)
ACH-11-1	4	4	4	4	0	0.00	1	8.75	19.66 (26.23)	30.66 (33.6)
ACH-21-1	4	4	4	4	1	17.50	2	18.75	18.33 (25.32)	27 (31.26)
ACH-33-1	4	4	4	4	2	15.00	2	21.25	21.66 (27.71)	28.33 (32.14)
RCH.524 X	4	4	4	4	1	18.75	1	13.75	13.33 (21.27)	18.66 (25.43)
RCH.111	4	4	4	4	2	23.75	2	25.00	16.0 (23.47)	19.33 (25.94)
RCH.371	4	4	4	4	0	0.00	1	10.00	18.0 (25.06)	20.66 (27.00)
MRC.6100	4	4	3	4	0	0.00	1	8.75	15.33 (22.98)	18.66 (25.57)
MRC.7228X	3	4	4	4	1	16.25	1	13.75	18.0 (25.06)	20.33 (26.75)
MRC.7351X	3	4	4	4	2	26.25	1	16.25	13.33	18

									(21.19)	(25.06)
NCS.145	3	4	4	4	0	0.00	0	0.00	12.66 (20.76)	18.66 (25.55)
NCS.207	4	4	4	4	1	11.25	0	0.00	19.66(26.23)	28.66 (32.33)
NCS.913	3	4	4	4	2	27.50	2	21.25	12.0 (20.17)	19.33 (26.00)
DHANWAN	4	4	4	4	1	18.75	1	13.75	18.0 (25.06)	24.66 (29.74)
BRAHMA	4	4	4	4	0	0.00	0	0.00	12.36 (20.44)	18 (25.060)
KDCHH.9632	4	4	4	4	1	15.00	0	0.00	15.66 (23.21)	20 (26.450)
KDCHH.531X	4	4	4	4	0	0.00	1	6.25	16.33 (23.64)	26 (30.58)
KDCHH. 441X	4	4	4	4	0	0.00	2	23.75	13.0 (20.94)	18 (25.08)
PRCH.101	4	4	4	4	1	16.25	2	25.00	15.66 (23.21)	21 (27.24)
PRCH.102	3	4	4	4	2	27.50	2	26.25	18.0 (24.39)	21.26 (27.71)
PRCH.103	4	4	4	4	2	25.00	1	15.00	17.66 (24.78)	19.33 (25.96)
NPH.2270	4	4	4	4	0	0.00	1	13.75	12.33 (20.5)	21.33 (27.46)
NPH.2171	4	4	4	4	0	0.00	0	0.00	18.66 (25.57)	27.0 (31.280)
NPH.2250	4	4	4	4	1	21.25	0	0.00	15.66 (23.09)	20.66 (26.99)
GK.207	4	4	4	4	1	26.25	0	0.00	15.0 (22.72)	21.33 (27.43)
GK.208	3	4	4	4	1	17.50	2	21.25	17.0 (24.28)	26.0 (30.58)
GK.209	4	4	4	4	1	13.75	1	6.25	15.0 (22.6)	18.66 (25.52)
TULASI.4	3	3	4	4	0	0.00	2	11.25	19.33 (25.96)	23.33 (28.78)
TULASI.117	4	4	4	4	0	0.00	1	6.25	15.66 (23.21)	20.66 (26.95)
RCH.2 Bt	4	4	4	4	2	26.25	2	22.50	18(25.06)	25.66 (30.23)
MECH.162 Bt	4	4	4	4	1	18.75	0	0.00	11.33(19.53)	18.0 (25.01)
BUNNY	4	4	4	4	1	15.00	0	0.00	17(24.35)	25.33 (30.16)

P = Protected UP = Unprotected

Bacterial blight

All 40 hybrids showed susceptibility to this disease at Dharwad. At Siruguppa, few hybrids showed resistant reaction. This may be due to the low incidence of the disease at this centre.

Bacterial blight disease (Per cent Disease Incidence)

Name of entry	Dharwad		Siruguppa	
	Protected	Unprotected	Protected	Unprotected
NECH.2R	4	3	2	3
NECH.3R	3	3	2	2
NECH.4R	3	4	3	4
Bunny VIP	3	4	2	2
2-62 VIP	3	3	2	2
2-42 VIP	4	4	1	2
JKCH.99	4	4	3	4
DURGA	3	4	2	2
ESWAR	4	3	3	2
ACH-11-1	4	3	2	1
ACH-21-1	4	4	3	2
ACH-33-1	4	4	2	2
RCH.524 X	3	4	2	3
RCH.111	4	4	2	3
RCH.371	4	4	2	1
MRC.6100	4	4	2	1
MRC.7228X	3	4	2	1
MRC.7351X	3	4	2	1
NCS.145	2	4	3	2
NCS.207	4	4	1	2
NCS.913	3	4	2	2
DHANWAN	4	3	1	2
BRAHMA	4	4	3	2
KDCHH.9632	3	4	1	3
KDCHH.531X	4	4	2	2
KDCHH. 441X	4	4	2	1
PRCH.101	4	4	2	2
PRCH.102	4	4	2	3
PRCH.103	3	4	2	3
NPH.2270	3	2	1	2
NPH.2171	3	3	2	2
NPH.2250	4	3	2	2
GK.207	3	3	2	2
GK.208	3	4	3	4
GK.209	4	4	2	3
TULASI.4	3	3	2	3
TULASI.117	4	3	3	3
RCH.2 Bt	4	4	2	2
MECH.162 Bt	3	4	3	2
BUNNY	4	4	2	1

Grey mildew

Very high incidence of Grey mildew was noticed in the Dharwad and Siruguppa centres and all the 40 hybrids were found susceptible (Grade 3 - 4) to this disease. In the Lam centre, the disease incidence varied from 12.91 to 29.33 per cent and 16.33 to 29.33 per cent respectively breeding and entomology trials. At this centre also, all hybrids were found to be equally susceptible. In Coimbatore, very low incidence of the disease was noticed and the

hybrids viz., NECH 2R, NECH 3R, 2-62VIP, JKCH 99, NCS 913, Dhanwan, Brahma, KDCHH 9632, KDCHH 531X, NPH 2171, NPH 2250, GK 207, GK 208, GK 209, RCH 2 Bt, MECH 162 Bt and Bunny were free from this disease. The last three hybrids are known to be susceptible for this disease.

Grey mildew disease (Per cent Disease Incidence)

Name of entry	Dharwad		Siruguppa		Coimbatore				LAM	
	P	UP	P	UP	P		UP		P	UP
					Grade	PDI	Grade	PDI		
NECH.2R	4	3	4	4	0	0.00	0	0.00	16.68 (23.97)	20.83 (27.14)
NECH.3R	4	3	4	4	0	0.00	0	0.00	12.91 (20.98)	18.25 (25.22)
NECH.4R	4	3	4	4	0	0.00	1	7.50	24.33 (29.52)	28.16 (32.04)
Bunny VIP	4	3	4	4	1	2.50	0	0.00	25.33 (30.18)	28.66 (32.36)
2-62 VIP	4	4	4	4	0	0.00	0	0.00	21.83 (27.82)	21.83 (27.820)
2-42 VIP	4	4	4	4	2	11.25	0	0.00	28.5 (32.25)	28.5 (32.25)
JKCH.99	4	4	4	4	0	0.00	0	0.00	24 (29.32)	24 (29.32)
DURGA	4	3	4	4	2	13.75	0	0.00	23.66 (29.07)	23.66 (29.07)
ESWAR	4	4	4	4	1	12.50	1	13.75	27.5 (31.61)	27.5 (31.61)
ACH-11-1	4	4	4	4	2	16.25	1	8.75	21.33 (27.48)	21.33 (27.48)
ACH-21-1	4	3	4	4	1	8.75	1	5.00	27.25 (31.43)	27.25 (31.43)
ACH-33-1	4	4	4	4	2	18.77	1	17.50	20 (26.55)	20 (26.55)
RCH.524 X	4	4	4	4	0	12.50	0	0.00	21.5 (27.56)	21.5 (27.56)
RCH.111	4	3	4	4	0	0.00	1	8.75	29.33 (32.76)	29.33 (32.76)
RCH.371	4	3	4	4	2	18.75	1	7.50	21 (27.2)	21 (27.2)
MRC.6100	4	4	4	4	1	17.50	2	17.50	19.33 (26.19)	19.33 (26.19)
MRC.7228X	4	4	4	4	1	12.50	0	0.00	27.83 (31.83)	27.83 (31.83)
MRC.7351X	4	3	4	4	0	0.00	0	0.00	19.16 (25.91)	19.16 (25.91)
NCS.145	4	4	4	4	1	3.75	1	8.75	24.5 (29.64)	24.5 (29.64)
NCS.207	3	4	4	4	1	2.50	1	6.25	28.33 (32.14)	28.33 (32.14)
NCS.913	4	3	4	4	0	0.00	0	0.00	18.58 (25.49)	18.58 (25.49)
DHANWAN	3	3	4	4	0	0.00	0	0.00	29.33 (32.77)	29.33 (32.77)
BRAHMA	4	4	4	4	0	0.00	0	0.00	20.83 (27.12)	20.83 (27.12)
KDCHH.9632	4	4	4	4	0	0.00	0	0.00	24 (29.31)	24 (29.31)
KDCHH.531X	4	4	4	4	0	0.00	0	0.00	27.5 (31.62)	27.5 (31.62)
KDCHH. 441X	4	4	4	4	1	15.00	0	0.00	18.83 (25.71)	18.83 (25.71)
PRCH.101	4	4	4	4	1	16.25	0	0.00	21.63 (27.84)	21.63 (27.84)

PRCH.102	4	4	4	4	1	3.75	0	0.00	26.83 (31.17)	26.83 (31.17)
PRCH.103	4	4	4	4	2	18.75	1	2.50	16.33 (23.82)	16.33 (23.82)
NPH.2270	4	4	4	4	1	2.50	1	3.75	18.83 (25.70)	18.83 (25.70)
NPH.2171	4	4	4	4	0	0.00	0	0.00	20.83 (27.14)	20.83 (27.14)
NPH.2250	4	4	4	4	0	0.00	0	0.00	25 (29.98)	25 (29.98)
GK.207	4	3	4	4	0	0.00	0	0.00	27.66 (31.72)	27.66 (31.72)
GK.208	4	3	4	4	0	0.00	0	0.00	18.5(25.42)	18.5(25.42)
GK.209	4	4	4	4	0	0.00	0	0.00	28.83 (32.46)	28.83 (32.46)
TULASI.4	4	4	3	4	1	2.50	1	2.50	20.3 (26.77)	20.3 (26.77)
TULASI.117	4	3	4	4	1	2.50	0	0.00	23.5 (28.98)	23.5 (28.98)
RCH.2 Bt	3	4	4	4	0	0.00	0	0.00	23.83 (29.2)	23.83 (29.2)
MECH.162 Bt	4	4	4	4	0	0.00	0	0.00	23.5 (28.96)	23.5 (28.96)
BUNNY	4	4	4	4	0	0.00	0	0.00	23.16 (28.76)	23.16 (28.76)

P = Protected UP = Unprotected

Helminthosporium and Cercospora leaf spots

The above two minor diseases were observed only in the Lam centre. All forty hybrids were found to be susceptible to these two diseases.

Helminthosporium and *Cercospora* leaf spots (Per cent Disease Incidence)

Name of entry	LAM, Guntur			
	<i>Helminthosporium</i>		<i>Cercospora</i>	
	Protected	Unprotected	Protected	Unprotected
NECH.2R	16.66(27.25)	26.33(30.87)	27.00(31.18)	33.00(34.99)
NECH.3R	21.66(27.59)	27.66(31.7)	28.33(32.13)	32.66(36.07)
NECH.4R	21.00(27.23)	23.33(29.49)	30.33(33.36)	38.33(38.16)
Bunny VIP	24.66(29.75)	27.66(31.72)	11.33(19.47)	16.33(23.51)
2-62 VIP	17.33(24.52)	23.33(28.85)	24.33(29.36)	31.33(33.94)
2-42 VIP	21.50(27.58)	26.66(31.07)	21.33(27.24)	30.66(33.54)
JKCH.99	24.5(29.65)	30.66(33.62)	27.33(31.33)	36.00(36.74)
DURGA	24.66(29.72)	27.00(30.95)	20.66(26.92)	26.66(31.04)
ESWAR	18.66(25.52)	24.33(29.41)	26.00(30.360)	36.66(37.06)
ACH-11-1	20.66(26.94)	25.33(30.22)	14.33(22.23)	20.00(26.53)
ACH-21-1	21.83(27.85)	27.00(31.31)	21.00(27.03)	31.33(33.98)
ACH-33-1	23.16(28.71)	29.66(32.99)	19.00(25.73)	31.33(30.39)
RCH.524 X	21.50(27.58)	26.33(30.86)	20.33(27.97)	29.00(32.41)
RCH.111	23.33(28.8)	26.33(30.88)	12.90(20.17)	15.33(23.00)
RCH.371	22.33(28.06)	28.00(31.94)	23.33(28.65)	32.33(34.39)
MRC.6100	17.50(24.72)	23.33(28.88)	31.66(32.50)	45.66(42.50)
MRC.7228X	20.33(26.78)	25.66(30.43)	27.33(31.48)	33.33(35.23)
MRC.7351X	16.66(23.97)	21.66(27.69)	21.66(27.45)	29.00(32.19)
NCS.145	17.83(24.72)	20.66(27.00)	21.00(27.03)	29.00(32.22)
NCS.207	18.00(25.07)	23.66(29.04)	15.00(22.72)	18.33(25.33)
NCS.913	17.33(24.51)	23.33(27.94)	12.66(20.76)	19.66(26.22)
DHANWAN	19.50(26.12)	24.66(29.77)	17.00(24.08)	23.00(28.37)
BRAHMA	15.00(27.74)	19.33(26.08)	26.33(30.48)	33.66(35.25)

KDCHH.9632	16.50(23.98)	19.66(26.32)	19.33(25.85)	25.00(29.66)
KDCHH.531X	18.50(25.45)	22.00(27.94)	22.33(28.03)	27.00(31.13)
KDCHH. 441X	18.16(25.03)	24.00(29.33)	20.00(26.27)	28.00(31.74)
PRCH.101	19.83(26.38)	23.00(28.65)	12.00(20.17)	16.00(23.49)
PRCH.102	18.33(25.34)	24.66(29.77)	12.66(20.52)	16.66(23.92)
PRCH.103	18.83(25.73)	23.00(29.65)	11.00(19.08)	17.00(24.05)
NPH.2270	20.33(26.64)	23.33(28.88)	15.66(23.21)	20.00(26.54)
NPH.2171	20.83(27.08)	25.33(30.19)	14.00(21.78)	16.00(25.20)
NPH.2250	21.66(27.75)	28.00(31.95)	14.66(19.56)	15.00(22.59)
GK.207	19.50(26.11)	24.33(29.53)	11.00(19.22)	14.33(22.11)
GK.208	14.66(22.4)	19.00(25.83)	15.66(23.21)	20.33(26.70)
GK.209	17.00(22.6)	20.00(26.53)	13.66(21.68)	17.66(24.82)
TULASI.4	16.50(23.85)	19.33(26.07)	11.00(19.26)	13.66(21.64)
TULASI.117	15.00(22.63)	18.00(25.10)	16.33(23.82)	22.33(28.12)
RCH.2 Bt	16.33(23.86)	20.66(27.01)	24.33(29.34)	31.66(34.17)
MECH.162 Bt	12.33(23.25)	20.66(27.02)	18.00(24.92)	26.00(30.43)
BUNNY	15.66(23.21)	17.66(24.85)	16.00(23.07)	21.33(27.89)
CD at 5%	4.74	2.07	6.83	8.22
CV %	11.4	4.4	16.8	17.2

Conclusions:

❖ The data on various parameters of evaluations of 36 test hybrids show that these hybrids are susceptible to sap sucking pests. The gene action to reduce Pink bollworm damage was not evident since high percentage of open boll damage was recorded in most of the test entries.

❖ The fibre quality data of these hybrids do not provide enough evidence that they conform to SITRA norms that is now accepted as the yard-stick for achieving defined yarn yield and quality. Confirmation of this through full scale mill test is desirable to recommend the promising hybrids for cultivation by farmers in this zone.

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