

Agronomy, Physiology & Biochemistry Panel

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TECHNICAL PROGRAMME FOR 2015-16

AGRONOMY

Agronomy IA: Agronomic requirements of promising pre-release/ recently released *hirsutum* /*arboreum* genotypes/ hybrids of cotton

Agronomy 1B: Evaluation of compact culture under HDPS with different nutrient levels.

Agronomy II: Developing suitable Agronomy for ruling *Bt* hybrids of the region

Agronomy III: Weed Management in cotton

Agronomy IV: Improving use efficiency of inputs (water and nutrient)

IVa: Drip irrigation in *Bt* cotton

IVb : Moisture conservation technique for ET based drip irrigation in *Bt* cotton

Agronomy V: Technology for organic cotton Production.

PHYSIOLOGY and BIOCHEMISTRY

1: Screening of cotton genotypes for abiotic stress tolerance

1a: Screening genotypes for water stress tolerance

1b: Screening genotypes for salinity stress tolerance

2: Studies on defoliant in cotton

3: Preparing for Climate Change: Effect of environment on crop phenology development, yield and fiber development

4: Manipulation of source sink relationship through growth regulators for enhancing production in cotton

- 5: Evaluation of cotton genotypes for seed oil, gossypol and protein.
- 6: Testing of swell (CCPU) Forchlorfenuron bio-efficacy on cotton crop (Paid trial)
- 7: Evaluation of Double for bio efficacy on *Bt* cotton (Paid trial)

Details of Technical Programme for 2015-16

COTTON AGRONOMY

The details of Technical Programme formulated under Agronomy are presented as under:

AgronomyIA: Agronomic requirements of promising pre-release/ recently released hirsutum arboreum genotypes/ hybrids of Cotton

Under this project, the pre-released varieties/hybrids developed and suggested by the breeding panel under irrigated/rainfed conditions shall be tested at respective centers in the zone for their response to optimum fertilizer levels and crop geometry requirements (applicable to both public & private sector varieties/hybrids). All the coordinating participating centers shall invariably conduct these trials incorporating the new genotypes /hybrids against the local check for determining the optimum spacing and fertilizer requirements. In addition, centers can take up agronomic requirements of any promising entry as per local requirements/needs after obtaining prior approval from the Project Coordinator, CICR, Coimbatore.

North Zone				
Zone/Centers	Hirsutum vars.	Hirsutum hybrids	Arbor. vars	Arbor. hybrids
Faridkot		FHH 209, HSHH 31		
Bathinda		FHH 209, HSHH 31		
Abohar		FHH 209		
Hisar		FHH 209, HSHH 31		

Central Zone				
Zone/Centers	Hirsutum vars.	Hirsutum hybrids	Barbedanse. vars	Hir x barb
Akola	SCS 1062, GBHV 180	DHH 1251		
Nanded	SCS 1062, GBHV 180	DHH 1251		
Rahuri	SCS 1062,	RHH 0917	DB 40	RHB- 0812,

	GISV 267			RHB - 0708
Surat		RHH 0917	DB 40	RHB- 0812, RHB - 0708
Junagarh	SCS 1062, GISV 267			
Bhwanipatna	SCS 1062, GBHV 180	DHH 1251		

Southern Zone					
Zone/Centers	Hirsutum vars.	Hirsutum hybrids	Barbedanse. vars	Arbor. Hyb	HxB
Dharwad			DB 40, DB 39		RHB 0812
Coimbatore	SCS 1062, BGDS 1063		DB 40, DB 39		RHB 0812
Lam	SCS 1062, BGDS 1063		DB 40, DB 39		RHB 0812
Raichur	SCS 1062, BGDS 1063				
Bangalore	SCS 1062, BGDS 1063				RHB 0812

Observation to be recorded (Replication wise data to be reported)

1. Plant height (cm) at harvest
2. No of Monpodia at harvest
3. No of Sympodia at harvest
4. Boll per sq meter.
- 5 Boll weight (g)
- 6 Final Plant population (no /net plot)
7. Seed cotton Yield (kg/ha)

Statistics

1. Standard Deviation
2. Critical Difference
3. Coefficient variation

Data should be reported in interaction tables in above said parameters to find out optimum spacing and fertilizer level requirement of of each entry, which is warranted for release

Agron 1B:Evaluation of compact culture under HDPS with different nutrient levels.

	North zone	Central Zone		South Zone	
Location	Bathinda* Faridkot* Abohar* Hisar Sriganganagar	Surat & Rahuri	Akola Bhwanipatna & Nanded	Coimbatore Raichur, Lam,& Srivilliputtur	Nandyal &Bangalore
Entries	CSH 3075, F 2381	ARBC 19	ARBC 64	LH 2298, TCH 1705	ARBC 64
Spacing (cm)	67.5x15 67.5x 20 80x 15*	60x10 75x10 90x10	45x10 60x10 75x10	60x10 75 x 10 90x 10	45x10 60x10 75x10
Fertilizer levels	RDF State Rec., 125% of RDF & 150% of RDF	RDF State Rec, 125% of RDF & 150% of RDF	RDF State Rec, 125% of RDF & 150% of RDF	RDF State Rec, 125% of RDF & 150% of RDF	RDF State Rec, 125% of RDF & 150% of RDF
Design	FRBD/Split	FRBD/Split	FRBD/Split	FRBD/Split	FRBD/Split

All the breeders of the above varieties / hybrids are requested to submit 1.0 kg (variety)/0.5 kg (hybrid) and 2.0 kg for variety HDPS and 1.0 kg for hybrids HDPS of **seeds directly to the concerned agronomists (not to Project Coordinator)** and to keep track with the agronomists for getting the data on agronomy trial and to submit the lint samples to CIRCOT from concerned location. The agronomists are requested to submit the 5 kg lint samples directly for micro-spinning to Director, CIRCOT, Mumbai. Further, agronomists are requested to send the agronomic trials data to the concerned breeder in addition to the Principal Investigator (Agronomy) in time to facilitate the breeder to submit the release proposals before due date.

Action to be taken:

1. These varieties/hybrids have been recommended by the Breeding panel after ascertaining their performance only.
2. Concerned Breeders shall send the required Seeds directly to the Agronomists of respective Centers without delay for taking up experiments.
3. One or two centers may send lint samples for full scale spinning.

Observation to be recorded (Replication wise data to be reported)

1. Plant height (cm) at harvest
2. No of Monpodia at harvest
3. No of Sympodia at harvest
4. Average sympodial length (cm)
5. Boll per sq meter.
6. Boll weight (g)

7. Final Plant population (no /net plot)
8. Seed cotton Yield (kg/ha)

Statistics

1. Standard Deviation
2. Critical Difference
3. Coefficient variation

Data should be reported in interaction tables in above said parameters to find out optimum spacing and fertilizer level requirement of each entry

IIA: Developing suitable Agronomy for ruling *Bt* hybrids of the region

Treatments:

- T1. Control (non *Bt* hybrid)
- T2. *Bt* hybrid
- T3. T2+Closer spacing (25% less than Rec.)
- T4. T3+125 % of Rec.Nutrients
- T5. T4 + recommended foliar spray
- T6. T5+ micro nutrients (Soil application)
- T7. T6+ location specific measures for control of reddening

Design: RBD

Replication: Three

Observation to be recorded (Replication wise data to be reported)

1. Plant height (cm) at harvest
2. No of Monpodia at harvest
3. No of Sympodia at harvest
4. Boll per sq meter.
- 5 Boll weight (g)
- 6 Final Plant population (no /net plot)
7. Seed cotton Yield (kg/ha)

Statistics

1. Standard Deviation
2. Critical Difference
3. Coefficient variation

All AICCIP centers except Lam, Dharward & Bhawanipatna

Kanpur will conduct the trial by using hirsutum varieties

Agronomy III: Weed Management in *Bt* Cotton

Objectives : To find out the suitable weed management strategies for *Bt* cotton.

Treatments:

- T₁: Pendimethalin @ 0.75 to 1.0 kg a.i/ha as Pre emr or PPI + one hoeing
- T₂: Tank mixture (Quizalofopethyl 50 g a.i/ha+ Pyriithiobac Sodium @ 62.5g a.i/ha) at 2-4 weed leaf stage + one hoeing.
- T₃: Glyphosate @ 1.0kg a.i/ha as directed spray at 2-4 weed leaf stage + one hoeing
- T₄: T₁+ Glyphosate @ 1.0kg a.i/ha as directed spray at 2-4 weed leaf stage (after hoeing)
- T₅: T₂+ Glyphosate @ 1.0kg a.i/ha as directed spray at 2-4 weed leaf stage (after hoeing)
- T₆: T₃+ Glyphosate @ 1.0kg a.i/ha as directed spray at at 2-4 weed leaf stage(after hoeing)

T₇: Weed Free check

T₈: Weedy check

Design: RBD

Replication: Three

Observation to be recorded (Replication wise data to be reported)

1. Plant height (cm) at harvest
2. No of Monpodia at harvest
3. No of Sympodia at harvest
4. Boll per sq meter.
- 5 Boll weight (g)
- 6 Final Plant population (no /net plot)
7. Seed cotton Yield (kg/ha)
8. Weed count species wise (before and after executing treatment)
9. Weed drymatter production (before and after executing treatment)
10. Weed Control Efficiency.

Statistics

1. Standard Deviation
2. Critical Difference
3. Coefficient variation

Economics

1. Cost of weeding
2. Cost of cultivation
3. Gross return
4. Net return
5. Marginal benefit cost ratio

Centre : Srigananagar, Banswara, Indore, Banglore & Nandyal

Agronomy IV : Improving use efficiency of inputs (water and nutrient)

Drip irrigation in *Bt* cotton

Objectives:	To find out the suitable drip irrigation regimes To find out optimum Nitrogen dose for cotton. To study the interaction effect between irrigation and Nitrogen.
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Treatments:

Main plot -irrigation regimes(Alternate day, based on ET)

$I_1 = 0.6 \text{ ETc}$

$I_2 = 0.8 \text{ ETc}$

$I_3 = 1.0 \text{ ETc}$

Sub Plot: Nitrogen & potassium level(Fertigation in 6 splits at 15,30,45,60,75 & 90 DAS)

$F_1 = \text{RDN \&K}$

$F_2 = 75 \% \text{ RDN \&K}$

$F_3 = 50 \% \text{ RDN \&K}$

$F_4 = 100 \% \text{ RDF in 3 splits through soil (0,45 \& 90 DAS)}$

Control: Surface method (Recommended IW/CPE ratio+100 % RDF in 3 splits through soil (0,45 & 90 DAS)) $K_p = \text{pan coefficient (0.7)}$, $K_c = \text{crop coefficient (0.45 for 0-25 DAS, 0.75 for 26-70 DAS, 1.15 for 71-120 DAS and 0.70 for 121-harvest)}$

Observation to be recorded (Replication wise data to be reported)

1. Plant height (cm) at harvest
2. No of Monpodia at harvest
3. No of Sympodia at harvest
4. Boll per sq meter.
- 5 Boll weight (g)
- 6 Final Plant population (no /net plot)
7. Seed cotton Yield (kg/ha)
8. Consumptive use (mm)
9. Quantity of water used (mm)
10. Effective rainfall (mm)
11. Water saving (mm & %)

Statistics

1. Standard Deviation
2. Critical Difference
3. Coefficient variation

Economics

1. Partial budgeting
 2. Cost of cultivation
 3. Gross return
 4. Net return
 5. Benefit cost ratio Analysis
- Nutrient availability at planting and harvest Nitrogen use efficiency, water use efficiency and water productivity

Crop and Variety: <i>Bt.Cotton</i>
Design : Split plot
Replication : Three
Fertilizer : As per recommendation

Centers : Faridkot, Banswara, Rahuri, Lam and Indore

Moisture conservation techniques of ET based Drip Irrigation in *Bt* Cotton

Main Plot

S1.Rec.Soil moisture Conservation

S2. Control

Sub plot

T₁ : Control

T₂: Polymulch

T₃: News paper mulch

T₄ : Crop residue mulch (5t/ha)

T₅: Dust mulch by hoeing

Design: Split plot

Replication : 3 (Three)

Note: 30 micron thickness with silver colour top layer

Observation to be recorded (Replication wise data to be reported)

1. Plant height (cm) at harvest
2. No of Monpodia at harvest
3. No of Sympodia at harvest
4. Boll per sq meter.
- 5 Boll weight (g)
- 6 Final Plant population (no /net plot)
7. Seed cotton Yield (kg/ha)
8. Consumptive use (mm)
9. Quantity of water used (mm)
10. Effective rainfall (mm)
11. Water saving (mm & %)
- 12.Root volume (cc)
- 13.Soil temperature

Statistics

1. Standard Deviation
2. Critical Difference
3. Coefficient variation

Economics

1. Cost of cultivation
 2. Gross return
 3. Net return
 4. Benefit cost ratio Analysis
- Nutrient availability at planting and harvest & uptake water use efficiency and water productivity

Centers: Junagarh, Banswara, Lam, Akola, and Indore

Agronomy V: Technology for organic cotton Production

T₁. Establishment of two rows of lucerne between cotton rows, lopped at 25 days interval and incorporated

T₂. Establishment of two rows of *Stylosanthus scabra* between cotton rows, lopped at 25 days interval and incorporated

T₃. Broad casting of sunnhemp at 45 DAS interval, incorporated before flowering

T₄. Broad casting of daincha at 45 DAS interval, incorporated before flowering

T₅. Broad casting of fodder cowpea at 45 DAS interval, incorporated before flowering

T₆. RD of Nutrient through organic based on P equivalent basis

T₇. Absolute control I (No organic & In organic)

T₈. Control (RDN through in organic)

Design: RBD Replication: Three

Note: Bund planting of subabul and glyricidia (in 10 % of area) and application of lopping to organic plots. In situ incorporation of crop residues obtained from cotton. Seed treatment and soil application of rec. bio fertilisers, foliar application of PPFM and dressing of 100 kg of neem cake in seed rows are common with T₁ to T₅. This project is to be conducted on the fixed site and plant protection by organic pesticides.

Centers: Kanpur, **Central** and South Zone centers.

Observation to be recorded (Replication wise data to be reported)

1. Plant height (cm) at harvest
2. No of Monpodia at harvest
3. No of Sympodia at harvest
4. Boll per sq meter.
- 5 Boll weight (g)
- 6 Final Plant population (no /net plot)
7. Seed cotton Yield (kg/ha)

Statistics

1. Standard Deviation
2. Critical Difference
3. Coefficient variation

Economics

1. Cost of cultivation
2. Gross return
3. Net return
4. Benefit cost ratio Analysis
 - Nutrient availability at planting and harvest & uptake Organic carbon content (before sowing and after harvest)

Proposed new experiments

Exploiting the potential of sub soiling in *Bt* cotton cultivation

Objectives: To find out the suitable sub soiling treatment for better cotton productivity

Treatments: 6

T₁ :Control/No sub soiling

T₂: Sub soiling at 1.0 m distance

T₃: Sub soiling at 1.5 m distance

T₄ : Cross sub soiling at 1.0m x1.0 m distance

T₅: Cross sub soiling at 1.5m x1.5 m distance

Design: RBD

Replications: 4

Observation to be recorded (Replication wise data to be reported)

1. Plant height (cm) at harvest
2. No of Monpodia at harvest
3. No of Sympodia at harvest
4. Boll per sq meter.
- 5 Boll weight (g)
- 6 Final Plant population (no /net plot)
7. Seed cotton Yield (kg/ha)
8. Root length and root length density at 90-110 DAS

Statistics

1. Standard Deviation
2. Critical Difference
3. Coefficient variation

Economics

1. Cost of cultivation
2. Gross return
3. Net return
4. Benefit cost ratio

Effect on soil properties

- a) Bulk density (g/m^3) at 0-15 cm and at 15-30 cm
- b) Infiltration rate (mm/hour)
- c) Initial and final soil status

3. Compaction depth measurements with sensors (If available)

5. Root length and root length density at 90-110 DAS

Centers: Faridkot, Bathinda, Abohar, and Surat

Location Specific : Studies on paired row planting under High density planting system for mechanized cotton cultivation

Treatment Schedule

T₁- Recommended package of practice

T₂- Planting by machine (75 X 10 cm)

T₃- T₂+ Weeding by Power weeder + pre and post emergence

T₄- T₃+ Boom sprayer (pesticide & foliar application) by using power tiller /tractor

T₆. T₄+Drip Irrigation

Design: RBD

Replication : 4

Variety :TSH1618

Observation to be recorded (Replication wise data to be reported)

1. Plant height (cm) at harvest
2. No of Monpodia at harvest
3. No of Sympodia at harvest
4. Boll per sq meter.
- 5 Boll weight (g)
- 6 Final Plant population (no /net plot)
7. Seed cotton Yield (kg/ha)
8. Consumptive use (mm)
9. Quantity of water used (mm)
10. Effective rainfall (mm)
11. Water saving (mm & %)

Statistics

1. Standard Deviation
2. Critical Difference
3. Coefficient variation

Economics

1. Cost of cultivation
2. Gross return
3. Net return
4. Benefit cost ratio
5. Labour & Energy requirement

Center: Srivilliputtur.

Cotton Physiology and Biochemistry

1: Screening of Cotton genotypes for abiotic stress tolerance

1a: Screening genotypes for water stress tolerance

Genotypes= Released popular genotypes+NC (LRA 5166) +LC.

Action: Data supply through monthly report -Centres

Seed requirement: 100gX8 = 800g (delinted seeds)

Observations:

- Seed cotton yield and ancillary data
- Phenology
- RWC, Chlorophyll stability index, Proline content, SLW, nutrient uptake
- Stress indices (PHSI, DMSI, YSI and S etc.)
- Monitoring of Periodic soil moisture profile.

1b: Screening genotypes for salinity stress tolerance

Centres: Lam and Dharwad (Pot/Microplot experiment)

Genotypes: Released popular genotypes + 1

Action: Data supply through monthly report-Centres

Seed requirement: 150x2 =300g (delinted seeds)

Observations:

Seed cotton yield and ancillary data

- Phenology
- RWC, Chlorophyll stability index, Proline content, SLW, nutrient uptake
- Stress indices (PHSI, DMSI, YSI and S etc.)
- Monitoring of soil salinity at initial and final stages.
- Leaf Na and K content at peak flowering stage.

Action: Data supply through monthly report-Centres

2. Preparing for Climate Change :Effect of environment on crop phenology development, yield and fiber development

Treatments:**Main Plots:** Date of Sowing

Early Sowing (3 weeks)

Normal Sowing

Late sowing (3 weeks)

Sub Plots: 1.Bt hybrid

2.Arboreum Variety

Sub Sub plots

1.Broad Bed Furrow

2.Control

Observations:

- Quantity of total & effective rainfall of three sowing periods
- No of days of wet spell and dry spell of three sowing periods
- Soil moisture at critical period of crop growth
- Crop Phenology with GDD and heat units

- Flowering pattern
- Biomass and its partitioning at 50,80,110 and 140 DAS
- Diseases and pest situations
- All yield and yield components
- Biochemical Observation (Dharwad and Surat)
- Fiber development starting at 7 Days After Pollination till 21 days and 10 days interval till boll open

Replication: Three

Centers: Lam, Dharwad , Junagarh and Surat

3: Evaluation of cotton genotypes for seed oil, Fatty acid profile, gossypol and protein.

Promising genotypes will be taken up for this trial.

Action: Data supply through monthly report -Centre

Source of materials: Br02a for irrigated Centre (Surat, Hissar); Br02b for rainfed Centre: Dharwad

Centre: Dharwad and Surat centres shall continue this experiment as per previous technical programme

4: Manipulation of source sink relationship through growth regulators for enhancing productivity in cotton

Objectives: To study the effect of ethylene and maleic hydrazide on source sink relationship in cotton

Main treatments: 2 cotton entries (one *Bt* entry and the other is non *Bt* entry)

Sub Treatments: 9

T₁ : Control

T₂ : Ethrel @8.5µmoles (45 ppm) at square initiation(40 DAS)

T₃ : MH@500 ppm at 80DAS

T₄ : Ethrel @8.5µ moles at square initiation followed by MH@500 ppm at 80DAS

T₅ : Ethrel @8.5µ moles at square initiation followed by MH@500 ppm at 95DAS

T₆ : Ethrel @8.5µ moles at square initiation followed by MH@750 ppm at 80DAS

T₇ : Ethrel @8.5µ moles at square initiation followed by MH@750 ppm at 95DAS

T₈ : Ethrel @8.5µ moles at square initiation followed by MH@1000 ppm at 80DAS

T₉ : Ethrel @8.5µ moles at square initiation followed by MH@1000 ppm at 95DAS

Experimental Design: FRBD

Replications : 3

Genotype: Popular *Bt* Hybrid of the zone with the recommended POP

Duration :2 years

Year of start : 2013-14

Observations :

- Plant height at 30 days interval from square initiation
- TDM at 30 days interval
- No. Of sympodia at 100 DAS and at Harvest
- LAI at 100DAS
- Yield and yield components
- Fibre quality parameters

Centres : Sriganagar, Khandwa and Surat.

1. Evaluation of Godrej Double for Bio-efficacy on *Bt* cotton (Paid trial)

Objective: To evaluate Godrej Double (Homobrassinolide 0.04% EC) a plant growth regulator for bio-efficacy, phyto-toxicity in Cotton and to study its residual effect on succeeding crops.

Product: Double developed by Godrej (Technical details enclosed)

Treatments:

T1: Control

T2: Double @ 75 ml per acre

T3: Double @ 100 ml per acre

T4: Double @ 125 ml per acre

T5: Planofix @ 10 ppm

T6: Nutrient consortia (CICR,Coimbatore)

T7*: Double @ 200 ml per acre

Time of Application

1. 1st Spray 35 – 40 days after sowing
2. 2nd Spray 15 days after 1st spray.

Water Volume: 200 litres per acre

Replications: 4 (Four)

Design: RBD

Observations to be recorded:

- No. of bolls per plant
- Average boll weight
- Seed weight per boll
- 100 seed weight
- Lint weight per boll
- Seed: Lint ratio
- Seed cotton yield/hectare
- Economics of these treatments

B. Sample for residue estimation from Treatments T1, T3 and T7 will be sent to IIBAT,

Chennai (TN) at the time of picking and logistics support will be provided by the organization.

C. Phyto-toxicity

Visual observation on vein cleaning, epinasty, hyponasty, wilting, leaf yellowing, leaf tip burning, leaf injury etc. if any to be recorded at 0, 1, 3, 5, 10 and 15 days after application. It will be recorded on 0 – 10 scale.

*** Treatment T7 will not be reported in the bio-efficacy, it is only for phyto-toxicity.**

D. Quality parameters

Note: Seed cotton samples will be provided to the company for quality analysis

F. Effect on succeeding crops;

In each plot 3 different crop species (normally grown after cotton) are to be sown and evaluated for the following parameters:

- a) Per cent germination and plant population after completion of plant emergence
- b) Phyto-toxicity Rating (0-10 scale, 0 = no phytotoxicity, 10 = 100 % damage) 15 and 30 days after planting
- c) Crop Growth parameters such as number of branches and plant height
- d) Final Yield and Yield Components
- e) Meteorological data (Sowing till harvest)

Centres: Sriganaganagar, Hisar, Lam, Dharwad, and Nanded

SCHEDULE OF OBSERVATIONS TO BE TAKEN UP

- Soil type (Depth of soil/soil texture)
- Irrigated/rainfed condition)
- Soil fertility status (initial)
- Periodic determination of soil moisture profile (0-15, 15-30, 30-60 cm) up to harvest in drip irrigation experiment
- Nutrient uptake at 50 % boll bursting stage
- Water productivity (based on yield & consumptive use of water)
- Nutrient/Fertilizer use efficiency (based on total uptake and yield)
- Seed cotton yield, boll no., boll weight, plant population /ha, seed yield.
- Fiber quality
- Economics analysis

SUBMISSION OF DATA ON THE TRIALS

Zone Date of submission of report

North 5th January

Central 1st February

South 20th February

Recommendation:

Bt cotton hybrid RCH 650 has been recommended for general cultivation in Punjab State.

Recommendation of $MgSO_4$ @ 1% (Two Sprays during boll development and maturity stage) has been given for management of leaf reddening in *Bt* Cotton in Punjab State.

Pre emergence application of Pendimethalin @ 1 kg a.i. /ha + Quizolofopethyle @50 g a.i. at 30DAS + one hoeing is recommended for producing higher yield in *hirsutum* cotton at Kanpur.

Ajeet 155 *Bt* at 60x60cm spacing along with 150% RDF gave higher yield and return and BC ratio over rest treatment and recommended for the commercial cultivation in Madhya Pradesh.

Bt. cotton hybrids, G.Cot.Hy-6 BG-II and G.Cot.Hy-8 BG-II have been recommended for cultivation with 125 % RDF (300: 50:0 NPK kg/ha) at spacing of 120 X 45 cm and 120 X 30 cm at Surat and Junagarh respectively.(Gujrat)

Under labours shortage situation, application of Pendamethalin @ 1.0 kg /ha as pre emergence followed by post emergence application of Quizalofopethyl 50 g /ha and one hoeing at 40 DAS have been recommended at NAU Surat and application of Pyriithiobac Sodium @ 62 g a.i./ha at 20-30 DAS + one hoeing at 40 DAS is advantageous at Junagarh (Gujrat).

Application of Pendimethalin 1.00 kg a. i. P.E. / ha + Quizalofopethyl 50 g a. i. PoE / ha was effective to control the weeds in cotton crop with higher net monetary returns and B : C ratio at Rahuri.

Weedicide Pyriithiobac Sodium @ 62.5 g a.i. /ha PoE + Quizalofopethyl @ 50 g a.i. at 2-4 weed leaf stage + one hoeing at 45 DAS is recommended higher seed cotton yield at Nanded.

Planting geometry of 120 cm x 60 cm and nutrient levels of 125% RDF i.e., 125:62.5:62.5 NPK kg/ha is recommended for Interspecific *hirsutum*(H x B) *Bt* hybrid MRC-7918 BG-II under assured rainfall conditions in vertisols at Dharward

Drip irrigation regime of 1.0 Et with fertigation of 100% RDN & K (150:75:75 NPK kg/ha), where in N & K are applied through fertigation in six equal splits at 15 days interval (30, 45, 60, 75, 90, & 105 DAS) and entire phosphorus as soil application basally is recommended for intra *hirsutum* *Bt* cotton hybrid in vertisols at Dharward.

Post emergent weedicide application of Pyriithiobac Sodium 10 EC @ 62.5 g ai/ha + Quizolofop ethyl 5 EC @ 50 g ai/ha at 30 DAS (Tank mix) with once hoeing at 45 DAS is recommended at Dharward.

Application of FYM @10t/ha + Seed treatment with Azotobactor and PSB each @ 25 g/kg seed is recommended to the *arboreum* cotton varieties at Dharward

HxB Bt cotton hybrid Mahadev is recommended under closer spacing (90 cm x 45 cm) with 125% RDF (150-75-75 NPK kg/ha) at Lam Guntur.

Pre emergence application of Pendimethalin @ 1.0 kg a.i/ha fb Quizalofopethyl 50 g a.i/ha, at 2-4 weed leaf stage or Pyrithiobac Sodium @ 62.5g a.i/ha or both recorded similar seed cotton yield at Lam Guntur.

The entries Viz; RAH 806, L 770, L 808, TCH 1777, GShv 169, GBhv 182, GShv 516, NDLH 1938, B 37, B 39, L770, L808 and L 801 recorded higher seed cotton yield under need based irrigated conditions, whereas the entries viz; RAH 806, CCH-12-3, PH 1060, GShv 169, GShv 516, NDLH 1938 and BS 37 recorded higher seed cotton yield under rainfed conditions at Lam Guntur.