

Crop Improvement

The salient achievements under AICCIP during the year is presented below.

Breeding trails - National trials

- *G. hirsutum*-CA 105, GISV 272 and GJHV 398 were found to be the best in terms of seed cotton yield in north, central and south zones, respectively under irrigated condition.
- All the ten *barbadense* cultures were superior in terms of yield over the common check variety Suvin in both central and south zones. DB 16 was the best genotype in central zone, whereas, GSB 40 was the best in south zone. However, quality wise, Suvin was the best in both the zones.
- The interspecific hybrid ARBHB1 047 was found to be the best in both the central and south zones.
- Among the *G. arboreum* varieties tested under irrigated condition in north zone and under rainfed condition in central zone and south zones, FDK 230 was the top yielder in north zone, while in central zone and south zones, the cultures CNA 39 and Das 385 recorded the highest yield, respectively. Several entries were found to have superior fibre quality attributes.
- Among the *desi* hybrids tested under irrigated condition in north zone and under rainfed situation in central zone, the hybrid MH 33 was the best in north zone and CISM 20 was the top performer in central zone.

Zonal trials - north zone

- In the *G. hirsutum* preliminary varietal trial, the highest seed cotton yield was recorded in LH 2152 (2293 kg/ha).
- Ten cultures were tested in the Coordinated Varietal trial, wherein, F 2228 was the best recording 2454 kg/ha of seed cotton yield.
- In the Coordinated Hybrids trial, three hybrids performed better than the check hybrids. LHH 1350 (2274 kg/ha) was the best hybrid.
- In the Coordinated *G. arboreum* varietal trial, LD 949 was found to be the best culture recording 2248 kg/ha of seed cotton yield.
- In the Coordinated *desi* hybrid trial, FMDH 23 (2406 kg/ha) out performed the checks and other test entries.

Central Zone

Irrigated Trial

- In the Coordinated intra *hirsutum* hybrid trial, the test hybrid GSHH 2729 ranked 1st with 2005 kg/ha followed by RHH 0622 with 1960 kg/ha.
- Eleven compact genotypes were tested under close spacing along with a local check variety under recommended spacing. Three genotypes recorded higher

yield as compared to local check. The highest yield was recorded in RHC 2022 with 2331 kg/ha.

- In the preliminary varietal trial of *G. barbadense* under irrigated condition, GSB 41 recorded the highest seed cotton yield of 738 kg/ha.
- In the Coordinated interspecific (*G. hirsutum* x *G. barbadense*) hybrid trial, ARBHB 1011 recorded the highest yield of 1812 kg/ha.

Rainfed Trials

- When 13 compact genotypes were tested under close spacing, three genotypes recorded higher yield as compared to local check variety. The highest yield was recorded in NH 615 with 1029 kg/ha.
- In the Coordinated varietal trial of *G. arboreum*, the highest seed cotton yield of 1790 kg/ha was recorded in GAM 162.
- In the Coordinated *Desi* hybrid trial, two test hybrids were superior to both the checks and the highest yield of 1442 kg/ha were recorded in AKDH 91.

South Zone

Irrigated Trials

- Eleven compact genotypes were tested under close spacing along with a local check variety under recommended spacing. All the test genotypes recorded higher yield as compared to local check variety. The highest yield was recorded in ADB 39 with 2331 kg/ha.
- In the preliminary varietal trial of *G. barbadense* under irrigated condition, all the test entries showed yield superiority over the check variety Suvin.
- In the inter specific hybrids trial, five test hybrids were superior to the check hybrid and the highest seed cotton yield of 1867 kg/ha was recorded in the test hybrid ARBHB 1011.

Rainfed trials

- In the coordinated hybrid trial, ten test hybrids showed yield superiority over the check hybrid Bunny. The highest seed cotton yield of 2223 kg/ha was recorded in the hybrid MRC7385.
- In the initial evaluation of compact genotypes under rainfed condition, fourteen genotypes were tested under close spacing along with a local check variety under recommended spacing. The highest yield was recorded in NH 545 with 1889 kg/ha.
- In the Coordinated *G. arboreum* varietal trial, two cultures performed better over the check varieties and the highest seed cotton yield of 1652 kg/ha were recorded in GAM 162 followed by 1554 kg/ha in AKA2005-3.
- In the Coordinated *desi* hybrid trial, six hybrids were better than both the check hybrids and the highest mean seed cotton yield of 2293 kg/ha was recorded in MH 32.

Crop Production

- The promising *G. hirsutum* genotypes viz., LH2207, LH 2018 and F 2164 as well as promising *G. hirsutum* hybrid FHH 141 were evaluated for agronomic requirement in north zone. Similarly, promising *G. arboreum* variety RG 542 and two *desi* hybrids viz., FMDH -9 and FMDH -10 were also evaluated.
- In central zone, promising pre-release cultures viz., GISV 218, AKH 9916, BS 279 and H 1316; H x H hybrid RAHH 259 and ARCHH 3028; H x B hybrid RAHB 189 were evaluated.
- Agronomic requirements of pre-release cultures like BS 279 and BS 277; H x B hybrids RAHB 301 and DHB 871; *desi* hybrids viz., FMDH -8 and RAJDH 279 were worked out in South zone centres.
- Foliar feeding of micronutrients with FeSO₄ @ 0.5% at Bhatinda and MgSO₄ @ 1.0% + ZnSO₄ @ 0.5% at Faridkot, Ludhiana, Sriganaganagar, Nanded and Srivilliputtur gave significantly higher seed cotton yield.
- Three sprays of 3% KNO₃ at Nanded and four sprays of 3% KNO₃ at Rahuri gave significantly higher seed cotton yield.
- Management of leaf reddening in Bt cotton has been worked out in different centres.
- Stress tolerant genotypes have been identified with drought susceptibility index in Surat. Different C:N ratios did not affect plant height, number of sympodial and monopodial branches, biomass and seed cotton yield.
- Drought resistant genotypes have been identified in Khandwa. The defoliation treatment of Ethrel @ 3000 ppm at 130 DAS had significant and beneficial effect on defoliation.

Entomology

- Breeding trial entries were screened and tolerant / resistant genotypes to sucking pests have been identified in north, central and south zone trials.
- In the advance screening of promising entries to key pests, the genotypes identified in preliminary screening were test verified for reaction to pests and tolerant / resistant ones were confirmed.
- Population dynamics of key pests in relation to climatic conditions were worked out in all the cotton growing zones. Raichur, Coimbatore and Dharwad recorded very high population of pink bollworm in sampled green bolls.
- Various standard insecticides used in cotton ecosystem effective against sucking pests were identified in different Bt cotton hybrids.
- Buprofezin, Acephate and Spinetoram at different concentrations in various locations were found to be effective against sucking pests and boll worms.

Plant Pathology

- Alternaria, bacterial blight and grey mildew were the major diseases in central zone and in addition to that Leaf rust in Karnataka and Andhra Pradesh and Tobacco streak virus in Andhra Pradesh and Tamil Nadu are gaining ground in south zone.

- Studies on the variability of cotton pathogens revealed that *Alternaria alternata* was responsible for this disease in north zone where as *A. macrospora* was predominant in central zone. However, both these species were reported from south zone in disease samples causing Alternaria blight.
- Based on pooled data of seven locations minimum PDI of Fungal foliar spots was observed in Kresoxim methyl (Ergon 44.3 %) @ 500 ml/ha followed by Propiconazole (0.1 %) and Kresoxim methyl (Ergon 44.3 %) @ 400 ml/ha.
- In another experiment, fungal foliar spots, grey mildew and bacterial blight showed minimum PDI with Kresoxim methyl 15% WG treatment followed by Acephate 60%WP + Kresoxim methyl 15% WG when tested at seven locations.
- Pooled data over three years (2010-12) indicated that five sprays of copper oxychloride and streptocyclin at 35, 50, 65, 80 and 95 days after sowing showed reduction of bacterial blight PDI from 28.8 to 12.0 and reduction of yield loss upto 22.0%.
- Out of 244 diploid cotton genotypes tested against *Fusarium* wilt for seedling resistance, 10 cotton genotypes exhibited 1-5 per cent (R) and 17 cotton genotypes exhibited 6-15 % (MR) incidence in Seedling Resistant Test. Out of above twenty seven genotypes, twenty five genotypes (R) showed > 50% hyaline reaction (vascular discoloration) and remaining two entries (S) showed <50% hyaline reaction in Adult Plant Resistance Test.

Notification of Cotton Genotypes for Cultivation in 2011-12

During the year 2011-12, four cotton cultivars have been identified for commercial cultivation in the country for various agro-climatic zones. Out of the four, three cultivars are straight varieties and one is hybrid.

| Name of the variety / hybrid | Species | Year of identification | Developed by | Area released for |
|------------------------------|------------------------|------------------------|-----------------|-------------------|
| H-1300 | <i>G. hirsutum</i> | 2011 | CCSHAU, Hisar | North Zone |
| ARBH-813 | <i>G. hirsutum</i> | 2011 | UAS, Dharwad | South Zone |
| CNA-1003 | <i>G. arboreum</i> | 2011 | CICR, Nagpur | South Zone |
| CSHG 1862 | <i>G. hir x G. hir</i> | 2011 | CICR, RS, Sirsa | North Zone |

Breeder Seed Production:

An effective maintenance of Nucleus and Breeder seed programme was undertaken by the concerned participating centres of AICCIP. The Breeder seed production in respect of National indent 2011-12 was taken up at seven AICCIP centres and at CICR, Nagpur. The production of LRA, 5166 was only 0.06 q as against 0.15 q during the year.

Tribal Sub plan

A new programme on "Tribal Sub plan" with a budget of Rs 30.00 lakhs was taken up. The programme was implemented in 12 centres.

Front Line Demonstrations in Cotton

During the year 2011-12, three types of FLDs were conducted all over the country. They were FLDs on cotton production technology (950), FLDs on farm implements (12 units) and FLDs on cotton IPM (7 units) through 15AICCIP centres.