J. Cotton Res. Dev. **21** (2) 131-139 (July 2007)

In ovulo embryo cultured hybrid between *Gossypium hirsutum* and *Gossypium arboreum* : hybridity confirmation

SUBHASH MEHETRE, SHYAM PARDESHI, SHARAD PAWAR, SANTOSH GAHUKAR AND UTTAM CHAVAN
Department of Botany, Mahatma Phule Krishi Vidyapeeth, Rahuri-413 722

ABSTRACT : Interspecific hybrid between *Gossypium hirsutum* var. JLH 168 x *G. arboreum*, Y-1 was attempted with a view to combine desirable characters of both species. It was not possible to obtain any single seed out of 7296 crosses made during the years 2003-04. *In vitro* culture of ovules excises from crossed bolls harvested after 24, 48, 72, 96 and 144 h after pollination on different media resulted in successful production of seedlings from ovules harvested after 72 h on M4 medium (BT+1.5 mg/1 IAA+1.0 mg/1 Kinetin+1.0 mg/1 NAA+275 mg/1 Casein hydrolysate) after 72-77 days. It was possible to establish three adult hybrids between *G. hirsutum* x *G. arboreum.* Morphological studies indicated that hairiness, shape of leaf, colour of petals, colour of pollens, etc. were found intermediate in F_1 hybrids, while the petal spot of *G. arboreum* was found dominant, except its intensity was reduced. Meiosis in parents was absolutely normal, while in F_1 on an average $13.76^{I}+8.70^{II}+0.25^{III}+1.27^{IV}$ was observed in hybrid at metaphase-I. Ring of four and chain of three chromosomes were noticed. The F_1 hybrids were male and female sterile. The leaf peroxidase and protein PAGE and RAPD analysis with random oligonucleotides viz., OPC 20, OPD 2 and OPD 5 revealed that the cross was a true hybrid of cross *G. hirsutum* var. JLH 168 x *G. arboreum*, Y-1. Further exploitation of this material is in progress.

J. Cotton Res. Dev. **21** (2) 140-142 (July 2007)

Effect of climatic conditions of different months on flowering and fruiting behaviour of *desi* cotton (*Gossypium arboreum* L.)

B. R. PATIL, S. BURGHATE, V. J. DHOLE, M. R. WANDHARE AND M. M. WAKODE
Cotton Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola-144 104

ABSTRACT : Investigation carried out at Cotton Research Unit, Dr. P. D. K. V., Akola indicated that all three GMS lines *viz.,* GAK-423, GAK-8615 and DGMS-1 exhibited earliness for flowering and fruiting behaviour in September than October followed by November and it might be due to varying climatic conditions during these three months. This information may be useful for properly synchronizing males and females for getting high seed yield and quality particularly in *desi* cotton hybrid seed production programme.

J. Cotton Res. Dev. **21** (2) 143-147 (July 2007)

An introgression–A new tool for quality and yield improvement in diploid cotton heterosis and combining ability

K. G. PATEL, RITA B. PATEL, MADHU I. PATEL AND V. KUMAR

Main Cotton Research Station, Navsari Agricultural University, Surat-395 007

ABSTRACT : Heterosis and combining ability analyses were carried out using three released varieties as lines and six introgressed materials i. e. *G. hirsutum* x *G. herbaceum* and *G. arboreum* x *G. hirsutum* were crossed through line x tester mating design for seed cotton yield and fibre quality parameters. The mean squares for parents and hybrids were significant for majority of the characters and indicated genetic diversity among the parents. The estimate of gca effects revealed that G. Cot-23 for seed cotton yield, and AH-32-3 for 2.5% span length, micronaire value and maturity coefficient showed positively significant gca

effect in desired direction and proved best general combiners. The variances due to gca and sca were non-significant and gca : sca ratio indicated predominance of additive gene action for these traits. The crosses G. Cot-17 x AKA-01-4, G. Cot-23 x AH-32-3 and Sanjay x Hh-3-71 exhibited high mean significantly positive heterobeltiosis as well as sca effect in desired direction for seed cotton yield.

J. Cotton Res. Dev. **21** (2) 148-152 (July 2007)

Variability and association analysis using morphological and quality traits in cotton (*Gossypium hirsutum*)

A. R. SAKTHI, M. KUMAR AND R. RAVIKESAVAN
Centre for Plant Breeding and Genetics, Tamil Nadu Agricultural University, Coimbatore-641 003

ABSTRACT : Variability and association analysis was carried out in *Gossypium hirsutum* accessions using 190 germplasm accessions. The phenotypic coefficient of variation which measures the total variation was found to be greater than genotypic coefficient of variation (GCV). High heritability coupled with high genetic advance was noticed for the characters plant height, single plant yield, number of bolls, boll weight and number of sympodia. Genotypic and phenotypic correlation showed that single plant yield had strong association with number of bolls and boll weight. Number of bolls had significant and positive association with 2.5% span length, micronaire and number of symbodia. The number of bolls had highest positive direct effect on single plant yield followed by boll weight and lint index. Number of sympodia and boll weight had highest indirect effect through number of bolls to single plant yield.

J. Cotton Res. Dev. **21** (2) 153-157 (July 2007)

Genetics of yield, fibre quality and their implication in breeding of interspecific cross derivatives of cotton

K. G. PATEL, RITA B. PATEL, MADHU I. PATEL AND V. KUMAR

Main Cotton Research Station, Navsari Agricultural University, Surat-395 007

ABSTRACT : Heterosis and combining ability were studied during 2004-05 with 18 F_1s made through line x tester analysis (3 x 6). The magnitude of genetic combining ability and specific combining ability variance revealed that the non-additive type of gene action was predominant for seed cotton yield and uniformity ratio. Whereas additive type of gene action was predominant for remaining traits. None of the female parents identified as good general combiner for all the characters studied except GISV-203 in uniformity ratio. Amongst males, GISV-178 and GISV-197 for seed cotton yield and ginning percentage; GSB-1 and GSB-6 for 2.5% span length, fibre strength, elongation percentage and short fibre index; for uniformity ratio GISV-203 and GISV-197 and for micronaire value GSB-6 were found good general combiners. In specific combining ability effect, for fibre quality, the crosses GISV-61 x GSB-1, GISV-61 x GSB-6, GISV-201 x GSB-1, GISV-201 x GSB-6, GISV-203 x GSB-1, GISV-203 x GSB-6 and GISV-203 x GSB-7 had significant heterobeltiosis and non-significant sca effect in desired direction could prove to be very useful to isolate true breeding transgressive segregant by employing simple selection schemes since they are supposed to be the crosses in which more of additive variation is operative for characters of interest. For seed cotton yield, only one hybrid GISV-203 x GISV-178 having highest *per se* performance with significant heterobeltiosis and non-significant sca effects may be rewarding for commercial exploitation.

J. Cotton Res. Dev. **21** (2) 158-161 (July 2007)

RAPD characterization of parental lines of some American cotton hybrids

VINOD SHARMA, AMIT JAIN, R. K. BEHL, B. S. CHHABRA, P. P. JAIN AND B. P. S. LATHER
Department of Plant Breeding, CCS Haryana Agricultural University, Hisar-125 004

ABSTRACT : Three cotton hybrids *viz.,* HHH-229, HHH-300, HHH-81 and their parents H-974, RS-875, H-1180, Laxmi, H-777 and 1695-175-J were studied with a view to characterize these cultivars on the basis of RAPDs. RAPD analysis was done using 22 arbitrary primers of which OPA 18, OPN 14, OPN 16 and OPB 11 gave consistent result and were found useful in distinguishing cotton genotypes. It further revealed that it was possible to differentiate the three cotton hybrids from their female parental lines though in most cases the hybrid resembled its male parent very closely. Using primer OPA 18, hybrids HHH-300 and HHH-81 could be distinguished from their respective parental lines. While primer OPN 14 could distinguish hybrid HHH- 229 from both its parents.

J. Cotton Res. Dev. **21** (2) 162-166 (July 2007)

Stability analysis of seed cotton yield and its components in upland cotton *(Gossypium hirsutum* L.)

S. S. SIWACH, RAJ BAHADUR AND R. S. SANGWAN
Department of Plant Breeding, CCS Haryana Agricultural University, Hisar-125 004.

ABSTRACT : Thirty-two genotypes of cotton (*Gossypium hirsutum* L.) were sown under April and May sown conditions during 2004-05 and 2005-06 to study the phenotypic stability. Mean square due to genotype, environment and G x E interaction was significant for all the characters studied. Both linear and non-linear components of G x E interaction were significant. However, linear portion of G x E was higher than non-linear. Considering stability parameters, six genotypes, namely, H-1226, H-1242, H-1287, H-1259, H-1300 and H-1316 were found ideal for seed cotton yield. Among them H-1287, H-1259, H-1300 and H-1316 were also found stable for most of the seed cotton yield contributing traits.

J. Cotton Res. Dev. **21** (2) 167-169 (July 2007)

Assessment of genetic diversity among some elite lines of *Gossypium arboreum* L.

DHARMINDER PATHAK, M. S. GILL AND JOHAR SINGH
Department of Plant Breeding, Genetics and Biotechnology, Punjab Agricultural University, Ludhiana-141 004

ABSTRACT : A study was conducted to assess genetic divergence among 30 elite lines of cotton using multivariate Mahalanobis D^2 statistics at Punjab Agricultural University, Ludhiana. Grouping of genotypes into different clusters was independent of the geographical origin of the genotypes. American cotton genotype formed a separate cluster from the *arboreum* cotton genotypes. The entries originating from the same centre were included in the same group suggesting that there is need to broaden the genetic base of *arboreum* cotton by introducing different alleles from the germplasm. Seed cotton yield, ginning outturn and boll weight should be considered for this purpose.

J. Cotton Res. Dev. **21** (2) 170-173 (July 2007)

H-1226 : A high yielding CLCuV resistant American cotton variety for Haryana state

S. S. SIWACH, B. P. S. LATHER, RAJ BAHADUR AND R. S. SANGWAN
Department of Plant Breeding, CCS Haryana Agricultural University, Hisar-125 004

ABSTRACT : Intensive breeding programme was initiated during nineties to increase yield potential and resistance to cotton leaf curl virus disease. Accordingly, H-1226 was developed with a view to replace the old cotton leaf curl virus disease susceptible varieties, namely, HS-6 and H-1098. H-1226 recorded a mean seed cotton yield of 1921 kg/ha as compared to HS-6, H-1098, RS-810, F-846 and Bikaneri Narma in AICCIP trials and 2294 kg/ha in Haryana state trials. However, this variety was found tolerant to sucking pest and bollworm as compared to old varieties. It has a good yield potential (4292 kg/ha) coupled with resistance to CLCuV disease and desirable fibre properties.

J. Cotton Res. Dev. **21** (2) 174-177 (July 2007)

Integrated nutrient management practices in cotton-based cropping systems in Tungabhadra project area of Karnataka

SATYANARAYANA RAO AND R. A. SETTY
University of Agricultural Sciences, Regional Agricultural Research Station, Raichur-584 101

ABSTRACT : A field experiment was conducted on permanent site under irrigated condition on medium deep black soil at RARS, Raichur from 1998-99 to 2001-02. Cotton crop during first year was rotated with sunflower in *kharif* and bengalgram in *rabi* during second year in one cycle of two years. The trial was laid out in split plot design with eight sources of organics as main plots and three levels of NPK as sub-plots. The pooled results of two cycles indicated that all the organics significantly increased the yields of cotton, sunflower and bengalgram. Application of FYM+VC+CR (33% each) gave the highest cotton yield (1469 kg/ha) which was 18.8% higher than no manure application. In sunflower and bengalgram also, the same INM practice (FYM+VC+CR–33% each) registered its superiority over other manurial treatments with respect to seed yields. The next best combinations were VC+CR (50% each) and FYM in cotton, VC+FYM (50% each) and VC in sunflower and FYM+VC and FYM+CR (50% each) in bengalgram. Further cotton, sunflower and bengalgram yields were increased significantly with 100% RDF application. Interaction effects were found to be non-significant in cotton and sunflower yields. However, FYM+VC+CR (33% each)+RDF registered higher crop yields. In bengalgram, seed yields noticed with FYM+VC+CR (33% each), FYM+CR (50% each) and VC in combination with 50 and 100% RDF were on par with each other.

J. Cotton Res. Dev. **21** (2) 178-179 (July 2007)

Effect of different spacings and nitrogen levels on growth and yield attributes of American cotton (*Gossypium hirsutum* L.) genotypes

KULVIR SINGH AND PANKAJ RATHORE

Punjab Agricultural University Regional Station, Faridkot-151 203
ABSTRACT : A field experiment was conducted at PAU Regional Station, Faridkot during *kharif* season of the year 2005 to evaluate the performance of two *hirsutum* genotypes under different spacings and nitrogen levels. The data indicated significantly higher seed cotton yield (12.8%) and monopods per plant for new genotype LH-1961 over the check variety (F 1861). The recommended plant spacing of 67.5 x 60 cm recorded 6.9 and 9.1% higher seed cotton yield over a spacing of 67.5 x 75 and 67.5 x 30 cm, respectively. Similarly, significant increase in seed cotton yield was observed at N level of 75 kg (2913 kg/ha) and 94 kg N/ha (2926 kg/ha) over 56 kg N/ha (2525 kg/ha).

J. Cotton Res. Dev. **21** (2) 180-183 (July 2007)

Effect of crop residues and farm yard manure on the growth and yield of American cotton (*Gossypium hirsutum* L.)

MANDEEP KAUR, MANINDER KAUR AND A. S. BRAR
Department of Plant Breeding, Genetics and Biotechnology, Punjab Agricultural University, Ludhiana-141 004

ABSTRACT : A field experiment was conducted at Punjab Agricultural University, Ludhiana during the **kharif** seasons of 2005 and 2006 to study the response of *hirsutum* cotton to the application of crop residues and farm yard manure in combination with chemical fertilizers. The experiment was laid out in a randomized complete block design with eight treatments i. e. T_1 : Absolute control, T_2 : Farmers' practice, T_3 : Recommended dose of fertilizers (RDF=75 kg N, 30 kg P_2O_5 and 30 kg K_2O/ha), T_4 : Recommended integrated nutrient management for the location, T_5 : 2 t/ha FYM+2 t/ha crop residue+100% N, T_6 : 2 t/ha FYM+2 t/ha crop residue+75% N, T_7 : 2 t/ha FYM+100% RDF and T_8 : 2 t/ha FYM+2 t/ha crop residue+100% RDF. Each of the treatments was replicated four times. The results indicated that all the treatments except absolute control and farmers' practice were at par with each other but significantly

better than control. The highest mean seed cotton yield (1800 kg/ha) was recorded in the treatment T_8 which was 41.6 and 22.1% more than the absolute control (T_1) and farmers' practice (T_2), respectively.

J. Cotton Res. Dev. **21** (2) 184-186 (July 2007)

Effect of methods of irrigation and levels of phosphorus on *desi* cotton (*Gossypium arboreum*) in shallow water-table condition

S. R. BHUNIA
Rajasthan Agricultural University, Agricultural Research Station, Sriganganagar-335 001

ABSTRACT : A field experiment was conducted during three consecutive years (i. e. 2002-04) at Khetawali Distributary, Hanumangarh, Rajasthan to study the yield, benefit : cost ratio and water use efficiency of *desi* cotton under high water-table conditions. Among the methods of irrigation, flood irrigation gave significantly highest seed cotton yield (16.96 q/ha), height (171.4 cm), bolls/plant (58.4), boll weight (3.45 g) as compared to furrow, alternate furrow and alternate furrow in rotation irrigation treatments. Water use (384.3 mm), benefit : cost ratio (2.45) and sustainability index (56.63%) were also higher in this treatment. However, the highest water use efficiency of 4.87 kg/ha-mm was recorded with alternate furrow irrigation in rotation. Application of phosphorus at 20 kg/ha recorded significantly higher seed cotton yield (15.90 q/ha) with higher yield attributes, sustainability index (53.59%) and benefit : cost ratio (2.29). Water-table depth was higher (75 to 110 cm) at sowing in most of the years, thereafter water-table went down at harvest (118 to 135 cm). Electrical conductivity (EC) of soils at harvest was higher with irrigation in alternate furrow, followed by alternate furrow in rotation, furrow and flood irrigation methods.

J. Cotton Res. Dev. **21** (2) 187-190 (July 2007)

Effect of potassium on the growth and yield of American cotton (*Gossypium hirsutum* L.)

MANINDER KAUR, MANDEEP KAUR AND A. S. BRAR
Department of Plant Breeding, Genetics and Biotechnology, Punjab Agricultural University, Ludhiana-141 004

ABSTRACT : A field experiment was conducted at Punjab Agricultural University, Ludhiana during the *kharif* seasons of 2004-06 to study the response of *hirsutum* cotton to soil and foliar applied potassium. The experiment was laid out in a randomized block design with six treatments i. e. T_1 : Recommended dose of nitrogen (soil applied), T_2 : Recommended dose of nitrogen and phosphorus (soil applied), T_3 : Recommended dose of nitrogen, phosphorus and potassium (soil applied), T_4 : T_3+foliar spray of muriate of potash at early boll formation @ 5 kg K_2O/ha, T_5 : T_3+foliar spray of muriate of potash @ 5 kg K_2O/ha at peak boll formation and T_6 : T_3+foliar spray of muriate of potash at early and peak boll formation @ 5 kg K_2O/ha. The treatments were replicated four times. The seed cotton yield, bolls per plant and yield per plant increased significantly in all the treatments over alone nitrogen application (T_1). On pooled basis, the increase in yield varied from 34.3% with T_2 to 44.6% with T_5 over T_1. The application of potassium in treatments T_3 to T_6 recorded on an average 41.5, 44.5 and 45.2% increase in seed cotton yield, number of bolls and yield per plant, respectively, over alone nitrogen application (T_1). Spray of KCl either at early or peak boll formation was not effective in increasing the yield over soil applied NPK.

J. Cotton Res. Dev. **21** (2) 191-193 (July 2007)

Agronomic evaluation of *Bt* hybrid (NCS-207 *Bt*) in vertisols of Andhra Pradesh under rainfed conditions

K. SRINIVASULU, K. HEMA, E. NARAYANA, N. V. V. S. D. PRASAD AND N. H. P. RAO
Acharya N. G. Ranga Agricultural University Regional Agricultural Research Station, Guntur-522 034

ABSTRACT : A field experiment was conducted on *Bt* cotton (NCS-207 *Bt*) to study the response for different levels of spacing and fertiliser in black cotton soils at Regional Agricultural Research Station, Lam, Guntur during *kharif* 2005-06. The results indicated that Mallika *Bt* recorded significantly higher seed cotton yield (44.00 q/ha) under closer row spacing (90 x 30 cm), which was significantly superior over wider plant spacing (90 x 60 cm and 90 x 90 cm) within the row. Seed cotton yield was not increased substantially on further increase in application of N, P and K levels from recommended dose of fertilizers (120-60-60 kg NPK/ha) to cotton hybrids and it was statistically non-significant.

J. Cotton Res. Dev. **21** (2) 194-196 (July 2007)

Effect of nutrients applied through organic and inorganic sources on the growth and yield of American cotton (*Gossypium hirsutum* L.)

MANINDER KAUR, MANDEEP KAUR AND A. S. BRAR
Department of Plant Breeding, Genetics and Biotechnology, Punjab Agricultural University, Ludhiana-141 004

ABSTRACT : A field experiment was conducted at Punjab Agricultural University, Ludhiana during the *kharif* seasons of 2004-06 to study the effect of soil application of zinc and foliar application of iron in combination with soil applied NPK and farm yard manure on the growth and yield of *hirsutum* cotton. The experiment was laid out in a randomized block design with eight treatments replicated four times. Eight treatments in the experiment were as follows : T_1 : Control, T_2 : Recommended dose of fertilizers (RDF=75 kg N, 30 kg P_2O_5 and 30 kg K_2O/ha) but phosphorus through single super phosphate (SSP), T_3: RDF but phosphorus through diammonium phosphate (DAP), T_4 : T_3+25 kg $ZnSO_4$/ha, T_5 : T_3+$FeSO_4$ spray, T_6 : T_3+25 kg $ZnSO_4$/ha+$FeSO_4$ spray, T_7 : 50% nitrogen through organic manures+50% nitrogen through inorganic fertilizers and T_8 : 25% nitrogen through organic manures+75% nitrogen through inorganic fertilizers. The results indicated that on an average of three years, the treatment T_8 (25% N through organic manures+75% N through inorganic fertilizers) recorded the highest seed cotton yield (1551 kg/ha) and remained statistically on par with other treatments and significantly superior to control. It gave 42.9 and 9.0% higher seed cotton yield than control (T_1) and recommended dose of fertilizers (T_2 and T_3), respectively. This treatment also produced highest number of bolls per plant, boll weight and significantly higher per plant yield than other treatments. The source of phosphorus failed to affect the yield. The soil application of zinc (T_4) and foliar application of ferrous sulphate (T_5) obtained 1486 and 1504 kg/ha mean seed cotton yield, respectively, which was marginally superior over recommended dose of fertilizers in T_2 (1403 kg/ha) and T_3 (1443 kg/ha).

J. Cotton Res. Dev. **21** (2) 197-200 (July 2007)

Agronomic evaluation of *Gossypium hirsutum* hybrids for varied spacings and nitrogen levels in vertisols under rainfed conditions

E. NARAYANA, K. HEMA, K. SRINIVASULU, N. V. V. S. D. PRASAD AND N. H. P. RAO
Acharya N. G. Ranga Agricultural University, Regional Agricultural Research Station, Guntur-522 034

ABSTRACT : A field experiment was conducted on clayey soils at Regional Agricultural Research Station, Lam Farm, Guntur under rainfed condition during *kharif* 2005-06 with the objective to find out optimum spacing and nitrogen level for pre-released cotton hybrids *viz.,* DHH-263 and Bunny. Closer row and plant spacing (90 x 60 cm) with 120 kg N/ha was found to be optimum for both the hybrids. Of the two hybrids tested, Bunny recorded significantly higher seed cotton yield than DHH-263. Similar trend was observed even on economic point of view, where Bunny recorded more net returns (Rs. 3,800/ha) as compared to DHH-263. Neither the spacing adopted nor nitrogen applied caused any impact on the quality of fibre.

J. Cotton Res. Dev. **21** (2) 201-205 (July 2007)

GA_3 and NAA affect some physio-morphological features and number of bolls in cotton (*Gossypium* spp.)

S. K. THIND, D. PATHAK AND R. S. SOHU
Department of Botany, Punjab Agricultural University, Ludhiana-141 004

ABSTRACT : Cotton (*Gossypium arboreum* L. cv. LD 694 and *G. hirsutum* L. hybrids LHH 144 and LHH 1128) crop was raised following standard package of practices during *kharif* 2004 and 2005. Foliar application of 50 mg/l of GA_3 (T_1), 100 mg/l NAA (T_2) either singly or in combination i. e. 50 mg/l GA_3+100 mg/l NAA (T_3) or 100 mg/l GA_3+50 mg/l NAA (T_4) was given at the time of anthesis during peak period of blooming. Plant height, number of nodes per plant, number of leaves per plant, average internodal length and canopy area were increased to the maximum value in GA_3 treated plants of LD 694. When combined application of both GA_3 and NAA was given, promotory effect on these parameters was increased. Maximum number of bolls per plant was produced in LD 694 when combined application of GA_3 (50 mg/l)+NAA (100 mg/l) was given. In hybrids LHH 144 and LHH 1128, application of GA_3 had more promotory effect than NAA. The canopy area was recorded maximum after foliar application of GA_3 followed by T_4 i. e. GA_3 (100 mg/l)+NAA (50 mg/l) in LHH 144. Whereas in LHH 1128 maximum canopy area and boll number per plant were observed in GA_3 treated plants followed by plants treated with NAA singly (T_2). The combined application of both plant growth regulators was less promotory for canopy area as well as boll production in hybrids.

J. Cotton Res. Dev. **21** (2) 206-211 (July 2007)

Effect of salinity on germination, growth and some morphophysiological parameters at early seedling and branching growth stages in cotton

PARAMJIT KUMARI AND K. S. GILL
Department of Agronomy and Agrometeorology, Punjab Agricultural University, Ludhiana-141 004

ABSTRACT : A pot experiment was conducted with 13 cotton varieties under salinity levels i. e. 1.5, 6, 10, 15 and 18 dS/m to assess the effect of salinity on germination, growth and some morphophysiological parameters related to their tolerance/susceptibility. Cotton varieties LH 2002, F 505 and LH 1556 had higher germination, fresh and dry weight under salinity over control. *Desi* varieties LD 694 and LD 327 had higher plant height and leaf number, while American varieties LH 1556 and F 1861 had lower but less reduction under salinity over control. Data showed that *desi* varieties were poor at germination but had higher plant height and leaf number, dry weight but fresh weight was more in American varieties but reduction per cent under salinity was less. They also had higher total leaf conductance, leaf transpiration and lower reduction under salinity. They also had lower sugar content in sap under salinity and lower osmotic potential and Na content in the sap than *desi* varieties indicating tolerance to salt stress in American and susceptibility in *desi* varieties of cotton.

J. Cotton Res. Dev. **21** (2) 212-213 (July 2007)

Effect of different tillage practices on the growth and yield of cotton (*Gossypium hirsutum* L.)

A. S. BRAR AND MANDEEP KAUR
Department of Plant Breeding, Genetics and Biotechnology, Punjab Agricultural University, Ludhiana-141 004

ABSTRACT : A field experiment was conducted from 2001 to 2003 at Punjab Agricultural University, Ludhiana to evaluate the effect of different tillage practices on the growth and yield of cotton during the *kharif* seasons. Four treatments consisted of no tillage, conventional tillage, deep tillage and deep+conventional tillage. The results revealed that deep tillage produced significantly higher seed cotton yield (1431 kg/ha) which was 78.21 and 53.05% more than no tillage (803 kg/ha) and conventional

tillage (935 kg/ha), respectively. Similarly, in deep tillage 82.63 and 28.15% higher number of bolls per plant was recorded as compared to no tillage and conventional tillage, respectively. In deep tillage, the seed cotton yield per plant was 92.5 g which was significantly higher as compared to no tillage and conventional tillage but at par with deep+conventional tillage.

J. Cotton Res. Dev. **21** (2) 214-217 (July 2007)

Performance of cotton hybrid PHH-316 (*Ganga*) to organic, inorganic and integrated fertilizers management and pest management

A. N. GIRI, P. S. KAPSE AND S. B. SURYAVANSHI
Cotton Research Scheme, Marathwada Agricultural University, Parbhani-431 402

ABSTRACT : Field experiments were conducted to find out the influence of organic, inorganic and integrated fertilizers management with organic, inorganic and integrated pest management on cotton productivity during 2004-05 to 2006-07 at Cotton Research Scheme, Marathwada Agricultural University, Parbhani. Results indicated that no marked differences were observed with respect to growth and yield attributes *viz.,* plant height, number of monopodia/plant and number of picked bolls/plant due to various treatments; whereas number of sympodia/plant and yield/plant were significantly affected due to various treatments. Application of FYM @ 10 t/ha alongwith 50% RDF and chemical control of bollworm as well as RDF+IPM treatments performed equally and produced significantly more seed cotton yield than the treatments of application of only FYM alongwith control of bollworm by organic sources i. e. T_1, T_2 and T_3.

J. Cotton Res. Dev. **21** (2) 218-221 (July 2007)

Effect of integrated nutrient management in enhancing and sustaining cotton (*Gossypium hirsutum* L.) productivity

K. SRINIVASULU AND K. HEMA
Acharya N. G. Ranga Agricultural University Regional Agricultural Research Station, Guntur-522 034

ABSTRACT : A field experiment was conducted during *kharif* seasons of 2003 and 2004 at Regional Agricultural Research Station, Lam, Guntur to study the effect of integrated nutrient management on productivity of cotton (*Gossypium hirsutum* L.) under rainfed conditions. The site of the experimental soil was vertisol which was low in available N and P_2O_5 and high in available K_2O with 0.38% organic carbon. Growth parameters i. e. plant height and number of monopodial and sympodial branches/plant did not markedly vary due to the fertilizer treatments. Application of FYM @ 10 t/ha alongwith 50% RDF recorded seed cotton yield of 2057 kg/ha which was comparable with that of 100% RDF (2096 kg/ha). Net returns and benefit : cost ratios observed with the treatments received FYM were lower though they yielded higher seed cotton due to the application and transport cost of FYM.

J. Cotton Res. Dev. **21** (2) 222-223 (July 2007)

Effect of management practices on fibre quality parameters of cotton under late planted conditions

SATYANARAYANA RAO AND A. D. JANAWADE
University of Agricultural Sciences, Regional Agricultural Research Station, Raichur-584 101

ABSTRACT : Effect of management practices (plant populations and growth regulators) and nutrient sprays on quality parameters of hybrid cotton (NHH-44) was assessed under late planted situations for two years (2000-01 and 2001-02) at Regional Agricultural Research Station, Raichur. The pooled data showed that none of the fibre quality parameters was influenced significantly due to plant population levels. Growth regulators and nutrient sprays brought significant differences only in seed index and lint index. Non-significant higher fibre quality index values were noticed with these sprays over control.

J. Cotton Res. Dev. **21** (2) 224-226 (July 2007)

Status of pink bollworm, *Pectinophora gossypiella* (Saunders) on cotton at Raichur, Karnataka

B. V. PATIL, M. BHEEMANNA, S. G. HANCHINAL, A. C. HOSAMANI AND A. B. BANSI
Department of Entomology, College of Agriculture and Regional Agricultural Research Station, Raichur-584 102

ABSTRACT : The present study revealed that the pheromone trap catches of pink bollworm (PBW) moths and incidence in bolls increased steadily over the years. The peak trap catches of PBW were noticed from November to February during cropping season over 10 years period. Mean trap catches of PBW were 56.12, 48.04, 44.50 and 26.26 moths/trap during November, December, January and February, respectively. Maximum per cent rosette flowers ranged from 21.12% in 2001-02 to 23.55% during 2004-05 season with highest incidence of bolls to the tune of 38.75 to 54.45%. This resulted in the increased locule damage, which ranged from maximum of 44.80% during 2001-02 to 62.56% in 2004-05 season during later part of the season.

J. Cotton Res. Dev. **21** (2) 227-229 (July 2007)

Bio-efficacy of bio-rational insecticides against bollworms of cotton

K. K. DAHIYA, B. L. TAKAR AND P. D. SHARMA
Department of Entomology, CCS Haryana Agricultural University, Hisar-125 004

ABSTRACT : Spinosad 48 SC an insecticide derived from the fermentation of actinomycete, alanycarb 30 EC, amitraz 20 EC, a new carbamate, a newly amine and decis tablet 25% and a new formulation of deltamethrin were evaluated for their bio-efficacy against bollworms of cotton. On the basis of bollworm damage and yield of cotton seeds it was found that spinosad @ 75 g a. i./ha, bulldock @ 18 g a. i./ha and deltamethrin @ 12.5 g a. i./ha were the best treatments followed by cypermethrin @ 50 g a. i./ha, decis tablet @ 12 g a. i./ha and fenvalerate @ 75 g a. i./ha.

J. Cotton Res. Dev. **21** (2) 230-234 (July 2007)

IPM in cotton–Adoption and constraints

DHARAMENDRA YADAV, M. M. PATEL AND R. K. CHOUDHRY
Jawaharlal Nehru Krishi Vishwavidyalaya College of Agriculture, Indore-452 001

ABSTRACT : The study was conducted in 10 randomly selected villages of Khargone district of Madhya Pradesh to know the adoption of integrated pest management practices by cotton growers in terms of their selected characteristics. The data collected from 120 randomly selected respondents revealed that a majority of farmers was using chemicals to protect cotton crop, while others were using cultural practices. Biological and mechanical practices were not adopted due to lack of knowledge. The study also indicated that farmers having large holdings were better in adoption of IPM practices than medium and small. The correlation coefficients of nine variables, namely, land holding, socio-economic status, land under cotton crop, information seeking behaviour, extension participation, risk orientation, economic motivation, management orientation and innovativeness were positive and significant at 0.01 level of probability with adoption of IPM practices. The multiple regression analysis revealed that the regression coefficient of only one variable i. e. management orientation was significant with adoption. All the selected 10 independent variables contributed only 43% of variation in the adoption of IPM.

J. Cotton Res. Dev. **21** (2) 235-238 (July 2007)

Biophysical and biochemical aspects of resistance in wild species of cotton towards leafhopper, *Amrasca biguttula biguttula* (Ishida)

K. VANITHA, P. SIVASUBRAMANIAN, N. SIVASAMY AND P. AMALA BALU
Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore- 641 003

ABSTRACT : The present study was carried out with the idea to identify leafhopper resistant cotton genotypes. Five tetraploid and two triploid cotton species were tested for their influence on the growth and development of leafhoppers, so that they can be utilized in development of resistant varieties. The per cent leafhopper survival indicated that *G. raimomdii* (6.7%) was highly resistant to leafhoppers followed by *G. triphyllum* (43.3%) with growth index of 0.07 and 0.46, respectively. Whereas *G. thurberi* and the species *G. barbadense* race *brasiliensis* having less trichomes, recorded higher per cent survival, in which nymphs develop quickly as adults within 7-8 days. Among all the tested cotton species, there was no significant influence of phenols and tannins on the growth and development of leafhoppers.

J. Cotton Res. Dev. **21** (2) 239-241 (July 2007)

Relative incidence of pest complex in Bt and non-Bt cotton cultivars

B. RAJA, T. V. K. SINGH, K. VIJAYA LAKSHMI AND CH. SREENIVAS
College of Agriculture, Acharya N. G. Ranga Agricultural University, Hyderabad-500 030

ABSTRACT : An investigation was carried out to find out the relative incidence of pest complex in three cultivars *viz.,* in MECH 162 Bt, MECH 162 non-Bt and Brahma cotton cultivars. The treatments were replicated nine times in randomized block design. The incidence of leafhopper, aphid and whitefly was found in all the three cultivars throughout the crop season, but the cotton bollworm, *Helicoverpa armigera* and spotted bollworm, *Earias vitella* infestation was comparatively less in MECH 162 Bt cotton than other cultivars. The maximum incidence of *H. armigera* was recorded during 14th and 15th weeks after sowing in all the three cultivars.

J. Cotton Res. Dev. **21** (2) 242-247 (July 2007)

Effect of dates of sowing on incidence of whitefly, *Bemisia tabaci* on cotton

V. S. ACHARYA AND A. P. SINGH
Division of Entomology, Agricultural Research Station, Sriganganagar-335 001

ABSTRACT : An experiment was conducted on cotton with six dates of sowing during **kharif** seasons of 2001 and 2002 at Agricultural Research Station, Sriganganagar to study the effect of sowing dates on incidence of whitefly, *Bemisia tabaci*. The results revealed that whitefly population remained very low upto last week of July and thereafter increased gradually and reached its peak in the month of September and then declined irrespective of sowing date. The population was recorded higher in late sown as compared to early sown crop throughout the season.

J. Cotton Res. Dev. **21** (2) 248-252 (July 2007)

Distribution pattern of cotton leaf curl virus disease in north India

D. MONGA, S. CHANDER, M. KUMAR AND N. P. SINGH
Central Institute for Cotton Research, Regional Station, Sirsa-125 055

ABSTRACT : The spread pattern of cotton leaf curl virus disease was studied by recording diseased and healthy plants in each row of two separate fields of size 0.4 ha each using susceptible variety HS 6 at four stages during three seasons (2003-05). The evaluation of data was done using ordinary run, doublet and corrected doublet analysis. The results indicated that in the beginning of season the inoculum came from outside sources as the data showed less clustering. Later in the season, the disease spread in the field from plant to plant as greater clustering was noted. At the end of season again, the role of outside source of inoculum became more as less clustering or more randomness was noted.

J. Cotton Res. Dev. **21** (2) 253-256 (July 2007)

Management of sucking pests and bollworms in cotton

S. S. KARABHANTANAL, M. BHEEMANNA AND B.V. PATIL
University of Agricultural Sciences Regional Agricultural Research Station, Raichur-584 101

ABSTRACT : A field experiment was undertaken at Regional Research Station, Raichur to know the effectiveness of different biointensive modules against cotton sucking and bollworm insect-pests under rainfed situation. From the investigation, it was revealed that treatments including imidacloprid as seed treatment at the rate of 10 g per kg seeds registered significantly lowest number of leafhopper, thrips, aphid and whitefly than the other treatments. Recommended plant protection schedule recorded significantly lowest bollworm damage (10.50%/plant), minimum bad opened bolls (6.30/plant) and maximum good opened bolls (10.37/plant), minimum locule damage (20.80%/plant) and highest yield (312.97 kg/ha). However, it was on a par with biointensive module having imidacloprid 70 WS as seed treatment @ 10 g per kg seeds–two releases of *Trichogramma* sp.- endosulfan-HaNPV. Whereas purely biopesticides involved treatment (T_1) recorded significantly lowest bollworm damage and highest yield over untreated control but was inferior to other biointensive modules.

J. Cotton Res. Dev. **21** (2) 257-259 (July 2007)

Evaluation of efficacy of integrated pest management (IPM) module *vis-a-vis* farmers' practices for cotton at farmers' field in Maharashtra

A. N. GIRI AND P. S. KAPSE
Cotton Research Scheme, Marathwada Agricultural University, Parbhani-431 402

ABSTRACT : The field experiments were conducted to evaluate IPM technology on cotton for economic viability at farmers' fields during 2003-04 to 2005-06 and compared with farmers' practice of plant protection (Non-IPM) over an area of 0.40 ha each. The collected data were analysed to assess economic viability of IPM technology. Results indicated that mean seed cotton yield of three years was harvested to the extent of 11.70 q/ha in IPM plots against 11.07 q/ha in non-IPM plots. Average additional seed cotton yield from IPM plots was 0.63 q/ha over non-IPM plots. An average enhancement in seed cotton yield from IPM plot was 5.69% over farmers' practice of plant protection. Average cost of plant protection of non-IPM plot was higher by Rs. 6185/ha than IPM plot. Additional net returns from IPM plots was Rs. 3915/ha over non-IPM plots with cost : benefit ratio of 1.79 from IPM plots and 1.47 from non-IPM plots. Thus, the results indicated that IPM technology has been proved economically more viable than the farmers' practice of plant protection.

J. Cotton Res. Dev. **21** (2) 260-266 (July 2007)

Multi-tier vegetables intercropping system for higher productivity and economic return in cotton

K. SANKARANARAYANAN, C. S. PRAHARAJ, ANDERSAN AMALAN KUMAR AND P. NALAYINI
Central Institute for Cotton Research, Regional Station, Coimbatore-641 003

ABSTRACT : Vegetable crops having different growth habits and requirements of resources were selected to achieve maximum production per unit area per unit time. The ultra short (coriander and amaranthus), short (radish) and medium duration vegetables (beet root, clusterbean, vegetable cowpea and dolichos) were used in the study. Growth and yield characters and seed cotton yield in the different multi-tier intercropping systems did not vary significantly. The highest seed cotton equivalent yield (43.5 q/ha) was registered with multi-tier system of cotton+radish+amaranthus, where intercrops were planted between cotton rows, which was 99% higher than that in sole cotton (21.9 q/ha). Quality parameters were not affected by the multi-tier intercropping systems. Multi-tier intercropping of radish and amaranthus planted between cotton rows under normal planting method also registered the highest gross return (Rs. 84,908/ha) and net return (Rs. 55,832/ha) and benefit : cost ratio (2.9) and was followed by intercropping of radish+coriander between cotton rows. The results summarized that amongst the different multi-tier intercropping systems tried, planting of radish and amaranthus between normally planted cotton rows registered the highest gross return, net return, benefit : cost ratio and seed cotton equivalent yield.

J. Cotton Res. Dev. **21** (2) 267-269 (July 2007)

Awareness pattern among cotton cultivators with reference to different diseases and their control

H. S. SAHARAN, J. BENIWAL AND J. P. S. YADAV
CCS Haryana Agricultural University Krishi Vigyan Kendra, Sirsa-125 055

ABSTRACT : Awareness pattern amongst the farming community to various diseases of cotton crop in Sirsa district in Haryana state is highlighted here. To determine the awareness pattern among cultivators for important cotton diseases, 100 cotton growing farmers visited Krishi Vigyan Kendra, Sirsa during the crop seasons of 2004-05 and 2005-06 who were interviewed. The diseases, namely, root rot, fusarium wilt, angular leaf spot (Bacteral blight) and cotton leaf curl virus disease were given special emphasis while collecting data. The results indicated that quantum of awareness varied for each disease and its control measures. Some remedial measures to improve the situation have been suggested.