ABSTRACTS
***Journal of Cotton Research and Development* 22(2) July, 2008**

J. Cotton Res. Dev. **22** (2) 135-138 (July 2008)

Genetic diversity assessment of *G. barbadense* accessions to widen cotton (*Gossypium* spp.) gene pool for improved fibre quality

N. MANIKANDA BOOPATHI, A. GOPIKRISHNAN, N. JAGADEESH SELVAM, R. RAVIKESAVAN, K. IYANAR, S. MUTHURAMAN AND N. SARAVANAN
Department of Plant Molecular Biology and Biotechnology, Tamil Nadu Agricultural University, Coimbatore-641 003

ABSTRACT : Understanding the genetic diversity and breeding potential of *Gossypium* spp., accessions are vital for the genetic improvement of cotton fibre quality and productivity. A substantial variation of fibre quality traits is known to exist in *G. barbadense* germplasm. The objective of this study was to assess the genetic diversity and relationship among the *G. barbadense* accessions using simple sequence repeat (SSR) markers. Thirty *G. barbadense* accessions and five *G. hirsutum* cultivars were genotyped with 88 SSR markers that generated 151 alleles with an average of 1.72 alleles per locus. Polymorphism information content (PIC) value had an average of 0.39 with a range of 0.11-0.73. The genetic similarity (GS) coefficient was estimated and clustering analysis based on the GS grouped the 35 *Gossypium* accessions into two distinct clusters comprising *G. barbadense* and *G. hirsutum*. Grouping based on clustering analysis was in good agreement with available pedigree and genetic background information. Diverse pairs of *G. barbadense* accessions were identified which were polymorphic at many SSR loci and they can be used as parents for hybrid development to maximize the fibre productivity and quality and development of segregating populations to map genes controlling fibre quality in cotton.

J. Cotton Res. Dev. **22** (2) 139-142 (July 2008)

Heterosis for seed cotton yield and yield components in upland cotton (*Gossypium hirsutum* L.)

S. P. POLE, S. M. SUDEWAD, S. K. KAMBLE AND S. B. BORGAONKAR
Cotton Research Scheme, Marathwada Agricultural University, Parbhani-431 402

ABSTRACT : A study was made in upland cotton with 7 x 7 diallel to assess the extent of heterosis over mid parent, better parent and standard check (NHH 44) for seed cotton yield and its related attributes. The highest heterotic effects were recorded in the hybrid PH 510 x AC 738 with 100.87, 54.95 and 23.56 per cent over mid parent, better parent and standard check, respectively, for seed cotton yield per plant. Heterosis for seed cotton yield was accompanied by lint yield, boll number and seed index. The study reveals good scope for commercial exploitation of heterosis as well as isolation of pure lines among the progenies of other heterotic F_1 hybrids.

J. Cotton Res. Dev. **22** (2) 143-146 (July 2008)

High temperature at boll bursting stage–A threat to cotton cultivation in north India

P. S. SEKHON, P. L. NEHRA, R. S. SARLACH AND R. K. GUMBER
Department of Plant Breeding, Genetics and Biotechnology, Punjab Agricultural University, Ludhiana-141 004

ABSTRACT : Forced boll opening (*Tirak*) has appeared in Punjab and Rajasthan after more than 30 years and had caused losses to the extent of 90 per cent in Abohar area adjoining Sriganganagar .This physiological disorder was reported in rainfed cotton in Punjab before 1960. Detailed investigation was

carried out which includes role of variety/hybrid, irrigation schedule and prevalence of high temperature at boll formation stage. The temperature during September- October was recorded at Sriganganagar and Abohar in the year 2005 as well as 2006. The air temperature and other weather data were compared for RAU Research Station, Sriganganagar and Cotton Research Station, Abohar with other relevant information on variety, irrigation schedule, *Bt*, non-*Bt* hybrids adopted by farmers in these areas. At Abohar as well as at Sriganganagar the temperature difference was more pronounced i. e. comparatively high in Sriganganagar as compared to Abohar particularly during boll formation stage which was much higher than required for boll formation. The role of irrigation, root development and *Bt* verses non-*Bt* was also compared based on data collected from various farmers' fields. It was concluded that during September-October temperature was 2.1°C-4.8°C higher at Sriganganagar than Abohar which caused Tirak in *Bt* cotton.

J. Cotton Res. Dev. **22** (2) 147-149 (July 2008)

Diallel analysis for estimating combining ability of quantitatively inherited traits in upland cotton

S. N. WANKHADE, S. P. PATIL, N. V. KAYANDE AND S. K. BURGHATE
Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Cotton Research Unit, Akola-444 104

ABSTRACT : A 6 x 6 diallel analysis study on cotton (*Gossypium hirsutum* L.) was launched to estimate the combining ability analysis in the inheritance and expression of some of significant quantitative characters using Griffing's Method-2, Model-1. The mean squares for general combining ability (gca) effects and specific combining ability (sca) effects were observed to be highly significant for all the characters under investigation. AKH-587 and AKH-9912 are the parents to be the best combiners for seed cotton yield/plant. In the present investigation, significant gca and sca effects were observed for all the characters indicating importance of both additive and non-additive gene action.

J. Cotton Res. Dev. **22** (2) 150-152 (July 2008)

Comparative performance of *Bt* cotton hybrids and their conventional version under rainfed conditions of Marathwada region

D. B. DEOSARKAR, S. S. BHATADE AND A. R. GAIKWAD
Marathwada Agricultural University, Cotton Research Station, Nanded-431 604

ABSTRACT : Comparative performance of *Bt* cotton hybrids and their conventional versions were studied to find out effect of *Bt* gene on yield, crop duration and fibre quality. On an average, *Bt* hybrids recorded 48.5 per cent higher seed cotton yield than their conventional versions and percentage increase of different hybrids ranged from 18.2 to 86.7. Boll number per plant and seed index had positive impact on seed cotton yield of *Bt* hybrids. *Bt* gene had no influence on ginning outturn and lint index. *Bt* hybrids showed higher mean value for Bartlett's earliness index (0.80) as against mean value for conventional hybrids (0.67). Higher proportion of seed cotton yield (80%) was harvested from first two pickings in case of *Bt* hybrids as against their conventional version (67%). As regards fibre properties, *Bt* hybrids were found slightly inferior or at par in respect of 2.5 per cent span length, uniformity ratio, micronaire, fibre tenacity and short fibre index. For fibre elongation and maturity ratio, both the groups depicted similar values.

J. Cotton Res. Dev. **22** (2) 153-156 (July 2008)

Integrated nutrient management in hybrid cotton

B. SAHADEVA REDDY AND E. ARUNA
Acharya N. G. Ranga Agricultural University, Regional Agricultural Research Station, Nandyal-518 502

ABSTRACT : A field experiment was conducted to find out the suitable nutrient management strategies for American cotton hybrid under irrigation for two years during *kharif* 2005-2006 and 2006-2007 in vertisols at Regional Agricultural Research Station, Nandyal. The treatments were absolute control , FYM

@ 10 t/ha, RD of NPK, RD of N alone, RD of N and P, RD of NPK+5 t/ha FYM, 50 per cent RD of NPK+10 t/ha FYM, 50 per cent RD of NPK+10 t/ha FYM+2% urea, RD of NPK+10 t/ha FYM and RD of NPK+sunhemp @ 15 kg/ha. Application of RD of NPK+10 t/ha FYM (T_9) recorded highest yield of 1775 and 1542 kg/ha, respectively, in both the years. Lowest kapas yield was recorded with absolute control. Application of RD of NPK+10 t/ha FYM resulted in gross returns of Rs. 35000 and 30840, respectively, during 2005-2006 and 2006-2007. Highest spad chlorophyll meter reading was recorded with the application of 50 per cent RD of NPK+10 t/ha FYM+2 per cent urea (T_8). Complete organic treatment i. e 10 t/ha FYM recorded highest oil percentage (19.21%).

J. Cotton Res. Dev. **22** (2) 157-159 (July 2008)

Irrigation requirement of cotton (*Gossypium* spp.) under shallow water table conditions

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

ABSTRACT : A field experiment was conducted during the rainy seasons of 2003-2005 for three consecutive years at Khetawali Distributary, Hanumangarh, Rajasthan to study the yield, benefit : cost ratio and water use efficiency of cotton cultivars under high water table conditions. Among the varieties, RS 2013 gave significantly the highest seed cotton yield (25.91 q/ha), water use efficiency (7.50 kg/ha-mm) and benefit : cost ratio (3.74) compared to RS 810, RST 9 and RG 8. Between the two irrigation levels, three irrigations at 45 days after sowing (DAS)+flowering+boll development stages recorded significantly higher seed cotton yield (24.57 q/ha) and benefit : cost ratio (3.45). However, water use efficiency (6.92 kg/ha-mm) was higher with two irrigations at 45 DAS+flowering stages. Water table depth was the lowest (100 to 125 cm in different years) at sowing in all the years, thereafter water table went down upto 1st week of July and then came up progressively till harvest. Electrical conductivity (EC) of soils at harvest was higher (1.9 to 2.2 dS/m) with two irrigations at 45 DAS+flowering stages over 45 DAS+flowering+boll development stages (1.5 to 1.8 dS/m).

J. Cotton Res. Dev. **22** (2) 160-162 (July 2008)

Effect of nitrogen and spacing on *desi* cotton hybrid (*Gossypium arboreum* L.)

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

ABSTRACT : A field experiment was conducted at Punjab Agricultural University, Ludhiana during the *kharif* seasons of 2002 and 2003. Treatments comprised three nitrogen levels (100, 150 and 200 kg N/ha) and four spacings (67.5 x 60, 67.5 x 75, 90 x 60 and 90 x 75 cm). The treatments were replicated four times in split plot design with nitrogen levels in main plots and spacings in sub-plots. The results revealed that 200 kg N/ha was superior (18.14 q/ha) to 100 kg and 150 kg N/ha. The closer spacing of 67.5 x 60 cm produced the highest seed cotton yield as compared to wider spacings (67.5 x 75, 90 x 60 and 90 x 75 cm). Similarly, closer spacing had maximum plant population during both the years.

J. Cotton Res. Dev. **22** (2) 163-166 (July 2008)

Effect of varieties, plant densities and fertility levels on American cotton (*Gossypium hirsutum* L.) under rainfed conditions

R. I. SISODIA, S. K. KHAMPARIA AND A. UPADHYAY
Jawaharlal Nehru Krishi Vishwa Vidyalaya, B. M. College of Agriculture, Khandwa-450 001

ABSTRACT : Field experiments conducted for two consecutive *kharif* seasons of 2002-2003 and 2003-2004 at the Regional Research Station, College of Agriculture, Khandwa (M. P.) revealed that the new American cotton genotype KH-117 under closest plant density of 45 x 45 cm and highest fertility level of 100 : 50 : 25 NPK (kg/ha) recorded highest values of average gross income/ha. But, intermediate fertility

level of 80 : 40 : 20 NPK (kg/ha) recorded highest average net income/ha indicating optimum economic dose for *hirsutum* cotton varieties under rainfed conditions in the tract.

J. Cotton Res. Dev. **22** (2) 167-169 (July 2008)

Response of *herbaceum* cotton to spacing and graded levels of NPK under irrigation

SATYANARAYANA RAO AND R. A. SETTY

University of Agricultural Sciences, Regional Agricultural Research Station, Raichur-584 101

ABSTRACT : The performance of *herbaceum* cotton (DB-3-12) was assessed with varied spacings (60 x 30, 75 x 30 and 90 x 30 cm) and fertilizer levels (30 : 15 : 15, 45 : 30 : 30 and 90 : 45 : 45 NPK kg/ha) for two years (2000-2001 and 2001-2002) under irrigation at Regional Agricultural Research Station, Raichur, Karnataka. The mean data revealed that seed cotton yield was not influenced significantly by varied spacings. However, wider spacing of 90 x 30 cm gave 5.5 and 12.1 per cent higher seed cotton yield over 75 x 30 and 60 x 30 cm row spacings, respectively. *Herbaceum* cotton responded significantly with increasing fertilizer levels upto 90 : 45 : 45 NPK kg/ha. Interaction effects were not found significant. The data on economics showed that combination of wider spacing (90 x 30 cm) with 90 : 45 : 45 NPK kg/ha fetched higher gross income (Rs. 25,648/ha) and net income (Rs.14,725/ha) as well as benefit : cost ratio (2.04) thus indicating profitable cultivation of *herbaceum* cotton under irrigation.

J. Cotton Res. Dev. **22** (2) 170-172 (July 2008)

Evaluation of sources, methods and rate of zinc application with and without FYM in *Bt* cotton

J. S. BRAR, A. S. SIDHU, B. S. SIDHU AND M. P. S. KHURANA
Punjab Agricultural University, Regional Station, Bathinda-151 001

ABSTRACT : A field study was conducted at Punjab Agricultural University, Regional Station, Bathinda during *kharif* 2005-2006 to evaluate the source, method and rate of zinc application in the presence and absence of FYM. The experiment consisted of two levels of FYM (0 and 10 t/ha), two sources (Zinc sulphate and zinc oxide), two methods of application (broadcast and drill) and three levels of zinc (0, 5 and 10 kg/ha) in a zinc deficient soil (0.35 mg/kg soil). The application of FYM increased the seed cotton yield in the year 2006. No significant increase in yield was observed during the year 2005. Zinc sulphate was found superior to zinc oxide. Drill method significantly increased the seed cotton yield. Zinc @ 10 kg/ha increased the yield by 47.6 and 17.6 per cent during the year 2005 and 11.8 and 7.2 per cent during the year 2006 over 0 and 5 kg Zn/ha.

J. Cotton Res. Dev. **22** (2) 173-175 (July 2008)

Effect of *in situ* water management and intercropping systems on yield of rainfed cotton

B. V. ASEWAR, A. S. JADHAV AND Y. A. KHAN
AICRP on Water Management, Marathwada Agricultural University, Parbhani-431 402

ABSTRACT : A field experiment was conducted to study the effect of *in situ* rain water conservation in cotton-based intercropping system on deep black soil. It was observed that the seed cotton yield of sole cotton was significantly superior over different intercropping systems. All the intercropping systems recorded significantly higher seed cotton equivalent yield over sole cotton. Among intercropping systems cotton+greengram was significantly superior over cotton+soybean and cotton+blackgram. Opening of furrow after every row recorded higher seed cotton yield and seed cotton equivalent yield over flat bed land layout and it was at par with opening of furrow after alternate row. Among intercropping systems cotton+greengram and among land layouts opening of furrow after every row recorded significantly highest gross monetary return over other treatments. Opening of furrow after every row or at alternate

row induced *in situ* soil moisture conservation after the harvest of intercrop, thereby creating soil moisture availability in the later growth stages of cotton. This ultimately resulted in higher seed cotton yield.

J. Cotton Res. Dev. **22** (2) 176-177 (July 2008)

Performance of *hirsutum* cotton under different row spacing and fertilizer levels

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

ABSTRACT : Yield potential of two *hirsutum* cotton genotypes RAC-1049 and RAH-100 was assessed at three levels of fertilizers and two levels of spacing at RARS, Raichur, under irrigation for 2000-2001 and 2001-2002. The pooled data showed that RAC-1049 and RAH-100 registered 16.0 and 14.0 per cent higher seed cotton yield over check entry-RAMPBS-155 (742 kg/ha). Wider spacing of 90 x 30 cm (933 kg/ha) was superior to 75 x 30 cm (855 kg/ha) and 75 x 60 cm (661 kg/ha) spacings. Increase in fertilizer levels from 80 : 40 : 40 to 120 : 60 : 60 NPK kg/ha increased the seed cotton yield significantly. None of the interaction effects with respect to seed cotton yield was found significant.

J. Cotton Res. Dev. **22** (2) 178-184 (July 2008)

Life table of *Helicoverpa armigera* (Hubner) on cotton

K. D. BISANE, SARITA K. NEHARE, D. M. KHANDE AND D. L. WASULE
Department of Entomology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola-444 104

ABSTRACT : Life tables for determining key mortality factors of *Helicoverpa armigera* (Hubner) were prepared on cotton during two consecutive years of 2004-2005 and 2005-2006. Life table on absolute population of field collected life stages revealed that early instar (I to III) larvae recorded maximum 35.81 per cent mortality over late instar (IV and V) (14.49%) and pre-pupal larvae (17.80%). *Eriborus argenteopilosus*, *Bracon* sp., *Campoletis chlorideae* and *Chelonus* sp. parasitized the early instar larvae to an extent of 7.67, 5.63, 3.50 and 3.07 per cent, respectively. HaNPV and fungal (*Metarrhizium anisopliae*) disease also contributed key role in early larval reduction. In late instar and pre-pupal larvae, Tachinid act as major mortality factor recorded 6.34 and 7.63 per cent parasitization, respectively. Pupal stage showed highest mortality over other stages, where Tachinid fly caused 15.47 per cent parasitization. The life table prepared on field and laboratory collected egg population revealed maximum mortality of 15.81 and 12.50 per cent in first instar larvae on cotton, respectively, followed by egg stage. The generation survival of *H. armigera* in field collected life stages was less than field and laboratory obtained eggs population indicating major influence of parasitoids under field condition and no persistence of egg parasitoids in field collected eggs was observed.

J. Cotton Res. Dev. **22** (2) 185-191 (July 2008)

Influence of organic amendments on the infestation of cotton stem weevil, *Pempherulus affinis* (Faust) (Curculionidae : Coleoptera)

P. SIVASUBRAMANIAN, K. BALAJI, A. JOSHUA SAMSON AND A. THANGA HEMAVATHY
Department of Entomology, Tamil Nadu Agricultural University, Coimbatore-641 003

ABSTRACT : Two field trials were laid out at Padionputhur pudupatty village, Karumathur in Madurai district and Siddalamputhur village, Tamil Nadu during 2003, to test the influence of organic amendments on the infestation of *Pempherulus affinis*. The experiment was laid out in a randomized block design with eight treatments replicated three times. The treatments were as follows : T_1–Basal application of farm yard manure @ 12.5 t/ha, T_2–Basal application of farm yard manure @ 12.5 t/ha+*Azospirillum* (2 kg/ha)+silica solubilizing bacteria (2 kg/ha)+phosphobacteria (2 kg/ha), T_3–Poultry manure @ 12.5 t/ha,

T_4–Press mud compost @ 5 t/ha, T_5–Press mud @ 5 t/ha, T_6–Coir pith compost @ 5 t/ha, T_7–Soil application of carbofuran 3G @ 1.0 kg a.i./ha on 20th and 45th DAS as standard and T_8–Untreated check. The results revealed that application of carbofuran 3G @ 1 kg a.i./ha, farm yard manure (12.5 t/ha) and farm yard manure (12.5 t/ha)+*Azospirillum* (2 kg/ha)+phosphobacteria (2 kg/ha)+silica solubilising bacteria (2 kg/ha) were equally effective in controlling plant mortality and gall incidence. While taking the incremental cost benefit ratio (ICBR) into consideration, application of FYM obtained the highest cost : benefit ratio and hence application of FYM is both economical and effective in managing stem weevil incidence.

J. Cotton Res. Dev. **22** (2) 192-194 (July 2008)

Population dynamics of sucking pests in *hirsutum* cotton and influence of weather parameters on its incidence in western Orissa

L. N. MOHAPATRA
All India Coordinated Cotton Improvement Project, Regional Research and Technology Transfer Sub-Station, Umerkote-764 073

ABSTRACT : Studies on population dynamics of sucking pests on *hirsutum* cotton and influence of weather parameters on their incidence were carried out at Regional Research and Technology Transfer Sub-Station, Umerkote (Orissa) during *kharif* 1999-2000 and 2000-2001 under rainfed conditions. Three major sucking pests i. e. leaf hopper, *Amrasca biguttula biguttula* (Ishida), aphid, *Aphis gossypii* Glover and whitefly, *Bemisia tabaci* Genn. infested the crop from 30th std. week to 50th std. week. Peak population of *A. biguttula biguttula, B. tabaci* and *A. gossypii* was attained during 41st std. week (Oct. 8-14), 44th std. week (Oct. 29-Nov. 4) and 35th std. week (Aug. 27-Sept. 2), respectively. Among the weather parameters, temperature showed a positive correlation with *A. biguttula biguttula* and *A. gossypii.* The mean RH favoured the activity of *A. biguttula biguttula* and *A. gossypii.* Effect of rainfall was adverse on *A. gossypii* but was favourable for the activity of *A. biguttula biguttula.*

J. Cotton Res. Dev. **22** (2) 195-199 (July 2008)

Biochemical basis of resistance in cotton to the whitefly, *Bemisia tabaci* Genn.

V. S. ACHARYA AND A. P. SINGH
Rajasthan Agricultural University, Agricultural Research Station, Sriganganagar-335 001

ABSTRACT : To determine the relationship with biochemical constituents of leaves and whitefly, *Bemisia tabaci* Genn., 25 genotypes of cotton were tested at Agricultural Research Station, Srigangangar. Correlation between population density of whitefly (adult, nymph) and the content of biochemical constituent of cotton during the vegetative and reproductive phase was calculated. The total tannin, phenol and gossypol were found non-significant negatively correlated with the population density of whitefly. The phenol, gossypol and tannin content in vegetative phase ranged from 0.24 to 2.45, 1.28 to 5.95 and 0.99 to 2.61 per cent, respectively, while it was recorded 0.41 to 2.12, 0.32 to 2.27 and 0.05 to 2.03 per cent, respectively, at reproductive phase.

J. Cotton Res. Dev. **22** (2) 200-204 (July 2008)

Impact of insecticide resistance management strategies for cotton in districts of Rajasthan

VICHITER SINGH, VINOD K. NOGIA AND SURESH KUMAR
Rajasthan Agricultural University, Agricultural Research Station, Sriganganagar-335 001

ABSTRACT : In India, cotton is important fibre crop. Thirty insect-pests starting from seedling to harvesting attack cotton crop in Rajasthan. In the years of pest favourable climatic conditions, the cotton growers have to go repeated number of chemical sprays resulting in not only increase in the cost of

cultivation but also imbalance in the cotton agro eco-system. Among bollworms, American bollworm, *Helicoverpa armigera* (Hubner) is a serious pest of this crop. *H. armigera* resistance against the insecticides those generally used in cotton needs to be reviewed so that future management strategies could be modified accordingly. So, to make the cotton production profitable, efforts were made for developing I. R. M. strategies module on cotton. Field experiments conducted on I. R. M. from the period 2002 to 2007 produced better results for lower pest population, pest incidence, pesticidal exposure, and in return higher conservation of bio-agents and seed cotton over chemical spray schedule. The components used under I. R. M. were variety resistant/tolerant to insect-pests and adoption of cultural, mechanical, biological and chemical methods of pest control. The overall number of sprays in IRM farmers' fields were 6.71, whereas non-IRM farmers sprayed 10.93 times. The per cent reduction in number of sprays and cost of sprays was 46.41 and 33.38, respectively. IRM plots received 18.78 per cent (2358 kg/ha) more seed cotton yield than non-IRM.

J. Cotton Res. Dev. **22** (2) 205-210 (July 2008)

Population dynamics of cotton bollworms in various cotton based intercropping systems

PRERNA CHIKTE, S. M. THAKARE, S. K. BHALKARE AND G. K. LANDE
Department of Entomology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola-444 104

ABSTRACT : The experiment was conducted during the *kharif* season of 2004-05 at Dr. PDKV, Akola to evaluate the effect of different possible intercrops on bollworm complex on cotton crop. The intercrops *viz.*, cotton+greengram, cotton+blackgram, cotton+cowpea, cotton+sorghum, cotton+maize, cotton+marigold, cotton+soybean in 1 : 1 ratio alongwith a treatment of sole cotton crop were sown. The intercrop cotton+cowpea proved to be the best recording least population of spotted bollworm, American bollworm and pink bollworm as against the treatment of sole cotton crop. The highest seed cotton yield of 251 kg/ha was recorded in cotton+cowpea-intercropping system as against 160 kg/ha recorded in the sole cotton crop.

J. Cotton Res. Dev. **22** (2) 211-214 (July 2008)

Evaluation of antagonistic properties of *Trichoderma* species against *Rhizoctonia solani* causing root rot of cotton

MAHALAXMI KUMARI, INDRA HOODA, HARI CHAND AND S. S. KARWASRA
Department of Plant Pathology, CCS Haryana Agricultural University, Hisar-125 004

ABSTRACT : A total of seven isolates of *Trichoderma* belonging to three species i. e. *Trichoderma viride, T. harzianum* and *T. virens* were tested for antagonism against *R. solani* causing root rot of cotton by dual culture method and production of volatile and non-volatile metabolites in *in vitro.* Isolates varied in growth rate, production of metabolites and efficacy to inhibit growth of pathogen. There was little difference among the isolates in causing inhibition of the pathogen after two days of inoculation in dual culture, but significant difference appeared after three days of incubation. Fast growing isolates were better than slow growing isolates inhibiting the pathogen in dual culture. However, no correlation existed between the growth rate and the production of metabolites by the antagonists. Among the isolates *T. viride*-III and *T. viride*-IV produced maximum amount of non-volatile and volatile metabolites, respectively, but both caused minimum growth inhibition of the pathogen. Therefore, both the growth rate as well as production of metabolites are important factors involved in the determination of the antagonistic efficacy of *Trichoderma* spp. against *R. solani.*

J. Cotton Res. Dev. **22** (2) 215-220 (July 2008)

Biochemical studies in *Bt* and non-*Bt* cotton genotypes against *Xanthomonas axonopodis* pv. *malvacearum* (E. F. Smith)

GOVINDAPPA, N. HOSAGOUDAR AND S. N. CHATTANNAVAR
Department of Plant Pathology, University of Agricultural Sciences, Dharwad-580 005

ABSTRACT : Biochemical studies were carried out on non-*Bt* genotypes Laxmi, Abhadita, DCH-32 and *Bt* genotypes RCH-2 *Bt*, JKCH-1 *Bt* and JKCH-2 *Bt*. All the test genotypes were found susceptible to the Bacterial blight disease. The results indicate that non-*Bt* genotypes recorded high amount of total protein (9.18 to 13.74%) as compared to *Bt* genotypes, but total phenol (-18.39 to -19.71%), total sugar (-12.17 to -15.59%) and reducing sugar (-11.01 to -19.05%) recorded lower amount compared to *Bt* genotypes. High amount of non-reducing sugar (13.18%) content at early stage (90 DAS) and low amount (-27.04%) at later stage (120 DAS) was compared to *Bt* genotypes. Further, the decrease in total protein (-23.28 to -25.17%), total phenol (-23.28 to -25.17%), total sugar (-25.14 to -35.21%), reducing sugar (-16.05 to -28.66%) and non-reducing sugar (-38.94 to 43.69%) was more in infected plants of Bacterial blight disease.

J. Cotton Res. Dev. **22** (2) 221-224 (July 2008)

Effect of pre-plant herbicides on the biocontrol efficacy of *Trichoderma* spp. against *Rhizoctonia solani*

MAHALAXMI KUMARI, INDRA HOODA AND S. S. KARWASRA
Department of Plant Pathology, CCS Haryana Agricultural University, Hisar-125 004

ABSTRACT : The potential impact of two widely used pre-plant herbicides i. e. Stomp and Trifluralin on the growth and development of *Rhizoctonia solani* and its antagonists i. e. *Trichoderma* spp. was investigated under *in vitro* condition. Stomp was significantly more toxic to *R. solani* than *Trichoderma* spp. at all the concentrations used. It gave 100 per cent growth inhibition of the pathogen at 500 µg a. i./ml but none of the isolates of *Trichoderma* was completely inhibited at this concentration. A similar trend was shown by Trifluralin. In greenhouse experiment, the herbicides were integrated with a isolate of *T. viride* to investigate their effect in reducing the seedling mortality of cotton. Soil treatment with *T. viride*-II significantly increased seed germination of cotton in comparison to control but its efficacy to control seedling mortality was reduced in the presence of Trifluralin. This herbicide also drastically reduced seedling height. However, Stomp had no adverse effect on the efficacy of *T. viride*-II in controlling the disease and on seedling length.

J. Cotton Res. Dev. **22** (2) 225-228 (July 2008)

Chemical and biological control of foliar diseases of cotton

GOVINDAPPA, N. HOSAGOUDAR AND S. N. CHATTANNAVAR
Department of Plant Pathology, University of Agricultural Sciences, Dharwad-580 005

ABSTRACT : In a field evaluation of fungicide, propineb @ 0.1 per cent, propineb @ 0.2 pe cent and propiconazole @ 0.1 per cent were effective in controlling the foliar diseases. Maximum yield of 1752.99 kg/ha was recorded in propineb @ 0.2 pe cent. Seed treatment with *P. fluorescens* (Pfl) @ 10 g/kg+foliar spray @ 0.2 per cent on 30, 40, 50, 60, 70, 80 and 90 DAS, seed treatment with Pfl @ 10 g/kg+foliar spray @ 0.2 per cent on 30, 50, 70 and 90 DAS, seed treatment with Pfl @ 10 g per kg +foliar spray @ 0.2 per cent on 30, 60 and 90 DAS and copper oxychloride (0.3%)+streptocycline sulphate (0.05%) gave better control of the foliar diseases than fungicidal treatments. Maximum yield of 1975.09 kg/ha was recorded in the seed treatment with Pfl @ 10 g/kg+foliar spray @ 0.2 per cent on 30, 40, 50, 60, 70, 80 and 90 DAS and was significantly higher over the control.

J. Cotton Res. Dev. **22** (2) 229-233 (July 2008)

Bio-efficacy of arbuscular mycorrhizal fungi, *Glomus mosseae* against reniform nematode, *Rotylenchulus reniformis* on cotton

N. SEENIVASAN AND K. DEVRAJAN

Tamil Nadu Agricultural University, Department of Plant Protection, Agricultural College and Research Institute, Killikulam-628 252

ABSTRACT : Pot culture experiments were conducted at Tamil Nadu Agricultural University, Coimbatore to study the effect of arbuscular mycorrhizal fungi (AMF), *Glomus mosseae*, as seed treatment and soil application at two doses against reniform nematode (*Rotylenchulus reniformis*) in cotton. Plants inoculated with *Glomus mosseae* irrespective of inoculation method at both the dosages (5 and 10 g/kg soil) reduced the nematode population and increased the plant growth and cotton yield. Among all treatments, soil application of AMF @ 10 g/kg soil recorded maximum shoot length, root length, fresh and dry weight of shoot and root. This treatment allowed the least nematode infestation (50-80 adult females/root system) resulted in lower soil population density (64-164 /100 g soil). The lowest number of egg mass/root system and eggs/egg mass were also recorded in AMF @ 10 g/kg soil treatment. The next best treatment was AMF @ 5 g/kg soil. When comparing methods of application, soil application with *G. mosseae* at both the doses performed better than seed treatment. Colonization of AMF was also maximum (77.3-87.3%) in the treatment of AMF @ 10 g/kg soil.

J. Cotton Res. Dev. **22** (2) 234-237 (July 2008)

Identification of cotton leaf curl virus disease (CLCuD) resistant lines

D. MONGA, M. KUMAR, S. CHANDER, N. P. SINGH AND R. A. MEENA

Central Institute for Cotton Research, Regional Station, Sirsa -125 055

ABSTRACT : Cotton leaf curl virus disease (CLCuD) has assumed serious proportions in the most potential irrigated cotton belt of north India comprising an area of 15 lakh hectares. The disease is caused by a single stranded circular Gemini virus consisting of DNA-A and two satellites i. e. DNA-1 and DNA-□ and is transmitted by white fly (*Bemisia tabaci*). Cultivation of resistant cotton genotypes is the most effective method of reducing yield losses due to CLCuD. The objective of this study was to identify resistant lines against cotton leaf curl virus disease (CLCuD). A total of 1799 cotton germplasm lines were planted during 1997-2006 crop seasons to screen against cotton leaf curl virus disease under natural field conditions. Infector rows of highly susceptible variety F-846 were sown after every two germplasm test lines. Field resistant lines were confirmed through grafting and whitefly inoculation. Twelve germplasm lines were found field resistant over the years and were subjected to graft inoculation and artificial transmission with whitefly. Out of the 1799 germplasm lines screened, only seven lines, namely, BP-52-16, MB-LYYH, JBWR-21, CNH-2773, AKH-9620, B 59-1679-2, Super okra virescent and 59-CCD were recorded resistant to cotton leaf curl viral disease. These sources of resistance can be utilized by the cotton breeders for their resistance breeding programme against this disease.

J. Cotton Res. Dev. **22** (2) 238-240 (July 2008)

Effect of organic manuring to rainfed cotton with ET based protection from sucking insect

A. S. THAKARE, H. G. DANDALE, D. N. GAWANDE AND C. S. TAYADE

Department of Entomology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola-444 104

ABSTRACT : A field experiment was conducted at Cotton Research Unit of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during *kharif* 2005-2006 to evaluate the effect of organic manuring to rainfed cotton with ET based protection by biopesticide NSE 5 per cent on sucking pests (aphids and leafhoppers) incidence. All the treatments were found significantly superior over absolute control in reducing the population of leafhopper, thrips and whitefly. Minimum population of leafhoppers was recorded in *neem* cake 1 t/ha+NSE 5 per cent spray treatment. Whereas minimum population of thrips and whitefly was

recorded in FYM 10 t/ha+NSE 5 per cent spray treatment. The population of leafhopper and whitefly was below ET in all the treatments throughout the crop season. Hence, no spray was required to be undertaken for the control of leafhopper and whitefly, whereas one spray was required for the control of thrips during the crop season. There were no significant differences amongst various treatments as regards the population of aphids.

J. Cotton Res. Dev. **22** (2) 241-242 (July 2008)

Cotton bollworms management with *neem* seed extract

C. S. TAYADE, A. S. THAKARE AND H. G. DANDALE
Department of Entomology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola-444 104

ABSTRACT : Various doses of *neem* seed extract in comparison to some commercially available *neem*-based formulations and endosulfan were evaluated against cotton bollworms of rainfed cotton during *kharif* 2006. The treatments were NSE–5 per cent, NSE–7.5 per cent, NSE–10 per cent, NSE–12.5 per cent, NSE–15 per cent, Azadirachtin 1500 ppm @ 2.5 ml/l, Azadirachtin 10000 ppm @ 1 ml/l, NSE–5 per cent+endosulfan 35 EC @ 0.03 per cent, endosulfan 35 EC @ 0.06 per cent and control. Minimum damage was recorded in treatment endosulfan 35 EC @ 0.06 per cent and this treatment was found significantly superior over rest of the treatments. The next best treatment was NSE–5 per cent+endosulfan 35 EC @ 0.03 per cent and this treatment was found *at par* with rest of the treatments except Azadirachtin 1500 ppm @ 2.5 ml/l.

J. Cotton Res. Dev. **22** (2) 243-245 (July 2008)

Field screening of cotton cultivars and germplasm against cotton stem weevil (*Pempherulus affinis* Faust) (Curculionidae : Coleoptera)

P. SIVASUBRAMANIAN, K. BALAJI AND A. JOSHUA SAMSON

Department of Entomology, Tamil Nadu Agricultural University, Coimbatore-641 003

ABSTRACT : There were 14 cultivars *viz.,* MCU 3, MCU 5, MCU 7, MCU 10, MCU 11, MCU 12, SVPR 1, SVPR 2, SVPR 3, LRA 5166, K11, KC 11, KC2, Surabi and five hybrids RCH 2, RCH 20, RCH 134, RCH 144 and Sakthi 9 selected for screening at Padisonputhur pudupatty village Karumathur in Madurai district, Tamil Nadu for two seasons during 2003. The variety MCU 5 was used as standard check. It was a multiple cross derivative, long staple and the average yield was about 20 q/ha. From the investigation, it was revealed that in both the seasons, cultivar MCU 3 was found to be resistant to stem weevil. The possible reason was the production of gummy exudates which flooded the tunnel made by the grub thereby suffocating the grub and finally leading to the death of the grub.

J. Cotton Res. Dev. **22** (2) 246-247 (July 2008)

Catalase isozyme pattern of different groups of *Ramularia areola*

S. N. CHATTANNAVAR, R. AMMAJAMMA, G. N. HOSAGOUDAR, P. K. CHAKRABARTY AND B. M. KHADI
University of Agricultural Sciences, Agricultural Research Station, Dharwad-580 007

ABSTRACT : The four different isolates representing separate groups of *Ramularia areola* collected from different places of the country *viz.*, Nagpur, Matura, Dharwad and Coimbatore were subjected to catalase activity. Among the four isolates, Dharwad and Matura isolates exhibited an additional band. In Dharwad isolate, the bands were prominent and thick, whereas in matura isolate, the bands were not prominent. However, all the four isolates have shown bands of different Rm values indicating the existence of variability among the four isolates.

J. Cotton Res. Dev. **22** (2) 248-249 (July 2008)

Management of Grey mildew of cotton through agro-chemicals

P. P. SHASTRY AND D. S. TOMAR

Main Cotton Research Station, Jawaharlal Nehru Krishi Vishwa Vidyalaya, B. M. College of Agriculture, Khandwa- 450 001

ABSTRACT : The experiments were carried out at the Regional Agricultural Research Station, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Khandwa, for two years 1998-1999 and 1999-2000, under rainfed conditions. The pooled data for two seasons indicate that propiconozole treatment (14.39%) was most effective and significantly superior over all treatments in reducing the per cent disease incidence of Grey mildew. The highest per cent disease control was recorded for propiconozole (77.19%). While the highest seed cotton yield was recorded for carbendazim treatment (532.41 kg/ha), which was significantly superior over all other treatments. The highest per cent increase in seed cotton yield over control was recorded for carbendazim (27.07%), while the increase ranged from 5.53 to 23.77 per cent for rest of the treatments as compared to control.

J. Cotton Res. Dev. **22** (2) 250-252 (July 2008)

Reactions of diseases in *Bt* and non-*Bt* cotton cultivars

D. S. TOMAR AND P. P. SHASTRY

Main Cotton Research Station, Jawaharlal Nehru Krishi Vishwa Vidyalaya, B. M. College of Agriculture, Khandwa-450 001

ABSTRACT : Twenty-six genotypes were screened for reaction of cotton diseases in East Nimar of Madhya Pradesh. Four *Bt* entries, namely, NCS-913, KDCHH-96, KDCHH-621 and KDCHH-9821 and two non-*Bt* genotypes Bunny and Ankur-651 showed moderately resistant reaction to disease with 1.1-2.0 grade. Only one entry Sandocot-35 non-*Bt* exhibited moderately resistant reaction against the Myrothecium blight with grade 2, while five *Bt* and six non-*Bt* cultures/varieties showed moderately susceptible reaction with grade 3.0. Genotype MRC-7301 BG II was found free from new wilt. So, these tolerant germplasms/genotypes could be further used in breeding programme.

J. Cotton Res. Dev. **22** (2) 253-255 (July 2008)

Economic feasibility of organically grown cotton (*Gossypium hirsutum* L.)

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 2002 to 2004 at RARS, Guntur to find out the economic feasibility of organically grown cotton in vertisols of A. P. The mean seed cotton yield revealed that the use of only organic manures like crop residue @ 5 t/ha or FYM @ 10 t/ha or *in situ* green manuring of sunhemp or various combinations of these organic manures did not substitute the chemical fertilizers completely. All treatments receiving only organic fertilizers were found to be inferior to the recommended dose of inorganic fertilizers (i. e. 90-45-45 kg NPK/ha, respectively). Application of FYM @ 5 t/ ha alongwith crop residue @ 2.5 t/ha was found superior over the *in situ* green manuring of sunhemp. The net returns and benefit : cost ratios for all the organic treatments were significantly lower than that of the recommended dose of inorganic fertilizers.

J. Cotton Res. Dev. **22** (2) 256-260 (July 2008)

Effect of legume intercrops on yield and profitability of rainfed cotton in vertisols

M. SREE REKHA, G. NAGESWARA RAO AND S. DHURUA
Acharya N. G. Ranga Agricultural University, Agricultural Research Station, Adilabad-504 002

ABSTRACT : A field experiment was undertaken to study the effect of intercropping legumes in cotton for three years from *kharif* 2002 to *kharif* 2004. Experiment was laid out in randomized block design with three replications. The legumes included soybean, greengram, blackgram and cowpea grown in 1 : 1 and 1 : 2 ratios with cotton. Results indicate that intercropping of cotton under rainfed conditions with soybean followed by greengram either in 1 : 1 or 1 : 2 ratio of each crop was more remunerative than sole crop of cotton. The total productivity of the system increased by 15 and 14 per cent, respectively, with legumes intercropped in cotton either in 1 : 1 and 1 : 2 row ratios over sole cotton.

J. Cotton Res. Dev. **22** (2) 261-263 (July 2008)

Package of practices for organic cotton production under summer irrigated conditions

R. S. RAUT AND S. S. MEHETRE
Water Management Project, Mahatma Phule Krishi Vidyapeeth, Rahuri-413 722

ABSTRACT : Field experiment was conducted at Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri in summer season during the years 1999-2000 to 2003-2004 for five years, to study suitable agronomic practices for organic cotton production. The results revealed that application of 50 per cent nitrogen through organic sources [FYM 5 t/ha+Azotobacter+ Azospirillium+PSB (Phosphorus solubilizing bacteria)+50 kg N/ha (inorganic source i. e. urea)] in two equal splits, as basal and at 30 days after sowing recorded the highest seed cotton yield and it was statistically significant over remaining treatments. All the yield contributing characters *viz.,* bolls/plant (50), boll weight (3.84 g) and yield per plant (94 g) were superior to other treatments. This treatment recorded the highest B : C ratio (1.85).