

CICR

News letter



CENTRAL INSTITUTE FOR COTTON RESEARCH, NAGPUR

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JULY - SEPT., 2010

ORGANIC COTTON STAKEHOLDERS' WORKSHOP AT CICR, NAGPUR

India has taken a quantum leap in organic cotton production in the recent past. Today India is the world leader in production of organic cotton contributing 61% of the global production of 175 thousand metric tones. About 117000 farmers are currently engaged in organic cotton production. Ironically, this revolution in organic cotton production is occurring in the Bt cotton era wherein 80-85% of the cotton area is under genetically modified (GM) cotton. Thus, India is a classical case of coexistence of GM and organic cotton production systems, either by accident or by compulsion. This situation has thrown up several challenges for the entire range of stakeholders in the production-supply chain and has also opened up several avenues for research in organic cotton system. In order to address these issues

and challenges an interactive workshop was convened on August 31 and September 1, 2010 at the Central Institute for Cotton Research, Nagpur in collaboration with Organic Exchange. Mrs. Prabha Nagarajan represented the Organic Exchange, the promoters of organic cotton movement. Representatives from the prominent organic certifying organizations including Ecocert, Control Union, IMO, Onecert and NOCA participated. The leading organic cotton producer groups from India- Bio Re, Chetna, Samrudhi, Pratibha Sintex, Mahima, Zameen Organic, Cotton Connect, Arvind Mills, Agrocel, Sunstar, Super Spinning Mills and Ecofarms actively participated in the deliberations.

This workshop addressed several contemporary issues - the availability of non GM varieties/hybrids in public sector and their suitability to different organic cotton growing areas, participatory seed production programmes, GM and insecticide residue testing procedures, diagnostic kits and their training needs, organic production technologies and quality input delivery systems and avenues for non-spinnable organic cotton. Several areas for cooperation in R and D



Dr. C.D.Mayee, Chairman, ASRB addressing participants of Organic Cotton Workshop in a special interactive session

between CICR, different certifying agencies and producer groups were also identified. A special interactive session was also held under the chairmanship of Dr.C.D. Mayee, Chairman, Agricultural Scientists Recruitment Board and former Agricultural Commissioner, Govt. of India. The workshop enabled the participants to learn from each others' expertise and capabilities and initiate an action plan to put in place a strong and sustainable organic cotton production system in India in wake of the challenges facing this segment of industry.

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WORKSHOPS ON MONITORING OF INSECT RESISTANCE ORGANIZED



Participants of Workshop on monitoring for Cry1Ac resistance doing laboratory exercise

1. Data generated by Monsanto Mahyco Biotech (MMB) in the 2009 cotton season had indicated the development of resistance to Cry1Ac in populations of the Pink bollworm (PBW) collected from Bt cotton fields of Gujarat. Dr. K.R.Kranthi, Director, CICR, Nagpur put forth his reservations on the research methodology and the data in a GEAC meeting that was called to resolve this issue of Pink Bollworm resistance and CICR was advised to take a lead in this area of work. Hence, as an initiative, PPP was established with MMB agreeing to join hands with CICR, Nagpur to work together on PBW resistance. CICR would be addressing the problem of pink bollworm resistance to the Cry1Ac in the year 2010 under TMC MM3.2 and GEAC project (ICAR 0430) with logistic support from Monsanto Research Centre, India. In connection with this, a workshop on monitoring of Cry1Ac resistance to Cry toxins in the pink bollworm was held at CICR, Nagpur on August 17-18, 2010 in which Entomologists drawn from the SAUs collaborating with CICR under TMC MM3.1 and TMC MM3.2 and senior staff of Monsanto Research Centre, India, Mahyco, Jalna and Dow, India participated. A total of 28 persons attended the event. The program was chaired by the Director, CICR Nagpur. Laboratory exercises were demonstrated for mass rearing protocols, including, preparation of diet, release of neonates, maintenance of adult cages, use of special rearing trays, preparation of toxin dilutions, sex differentiation in larval stage etc.

2) An one day workshop on resistance monitoring for insecticides used against sucking insect pests with special emphasis on jassids was held at CICR, Nagpur on August 19,



Participants of Resistance Monitoring Workshop with Dr. Kranthi, Director, CICR, Nagpur.

2010 in the public private partnership mode. It was attended by entomologists from the SAUs collaborating with CICR under TMC MM3.1 and TMC MM3.2. Resistance monitoring data generated at 6 centers, using a common protocol, namely Sirsa (for North India; Dr.Rishi Kumar), Gujarat (Dr. H. Desai), Nagpur (Central India including Maharashtra and Madhya Pradesh; Dr.S.Kranthi), Guntur (Dr.G.M.V. Prasad Rao), Dharwad (Dr.Udikeri) and Coimbatore (Tamil Nadu; Dr. Dharajothi) was presented. Refinements were made in the technical program for monitoring resistance in sucking pests. Dr. Ranga Rao and his staff from Bayer, India attended the workshop. The program was chaired by the Director, CICR Nagpur.

PARTICIPATION IN AGRICULTURAL FAIR EXPO PROGRAMME – 2010



Honorable State Rural and Development Minister interacts with Scientists of CICR.

Southern Regional Agricultural Fair was organized by Tamil Nadu Agricultural University (TNAU) at Coimbatore District Small Industries Association (CODISSIA) Complex, Coimbatore, Tamil Nadu from Sept.30,2010 to Oct.03,2010. This programme was inaugurated by the State Rural and Development Minister Mr. Pongalur Palanisamy. As many as 250 Agricultural Research organizations of various Central / State Agriculture Departments, Research Stations, Colleges, Farm machinery and farm input producing companies and Non-Government Organizations (NGO) participated and exhibited the new innovations, farm machineries, equipments and improved production / protection technologies in this fair. CICR, Regional Station, Coimbatore, Tamil Nadu also participated in the Southern Regional Agricultural Fair (SRAF) by exhibiting a stall with display boards depicting photographs



View of the Stall put up at the Agricultural Fair EXPO

of recent cotton varieties / hybrids, live specimens of cotton pests, natural enemies, nutritional deficiency symptoms and diseases of cotton. Farmers were explained about various technologies such as multi-tier cropping system, nutritional management and IPM / IRM Strategies in cotton pest management. Different folders/ leaflets pertaining to the improved cotton production technologies and emerging pest management and value addition to Cotton were also distributed. More than 2500 farmers visited CICR Stall. This fair was a useful platform to showcase the technologies developed by CICR, RS, Coimbatore for the benefit of cotton farmers. The programme was coordinated by Dr.(Mrs.)Dhara Jothi, Senior Scientist.

INAUGURATION OF COTTON PLANT CLINIC CENTRE



Project Coordinator & Head inaugurating the Plant Clinic Centre

Under the project TMC MM – II Insecticide Resistance Management, a new Plant Clinic Centre was inaugurated by Dr. N. Gopalakrishnan, Project Coordinator (Cotton) and Head, CICR Regional Station, Coimbatore on September 23, 2010 at Adivelli village of Gudimangalam Block, Tirupur District. In the clinic, photographs and live specimens of cotton pests, natural enemies and diseases of cotton are exhibited. The centre is intended to be kept open daily in the evening hours to educate the farmers.

A training-cum-group meeting for the farmers was also organized. Dr. B. Dharajothi, Senior Scientist and District Coordinator of the Project explained about the activities of the project and requested the farmers to utilize the opportunity. Dr. T. Surulivelu, Principal Scientist and State Coordinator of the Project highlighted the importance and significance of the plant clinic centre and briefly explained about pest management with particular reference to IRM. Dr. N. Gopalakrishnan, Project Coordinator (Cotton) elaborated about the national scenario of cotton production and desired that the ELS cotton area in Tamil Nadu needs to be increased with enhanced net profitability to farmers. The use of biological control agents and need based application of insecticides were all emphasized for profitable cotton cultivation. Dr. T. Shilesh, Joint Director of Agriculture addressed the farmers about various aspects of Cotton Cultivation. Dr. S. Mohan, Professor of Entomology, TNAU, Dr. K. Sankaranarayanan, Senior Scientist, Dr. S. Manickam, Senior Scientist and Dr. M. Amutha, Scientist also participated in the programme and interacted with the farmers.

IRC MEETING OF RS COIMBATORE HELD



Director, CICR, Nagpur with Scientists of CICR RS Coimbatore at IRC meeting

The Institute Research Committee (IRC) meeting of CICR, Regional Station, Coimbatore was held on July 7-9, 2010 at CICR, Regional Station (RS), Coimbatore under the Chairmanship of Dr K. R. Kranthi, Director, CICR Nagpur. Dr V. S. Nagrare, Secretary IRC welcomed Dr K. R. Kranthi, Director, CICR Nagpur and Chairman IRC and all the Scientists. The Chairman in his opening remarks reiterated that the scientists should focus on flagship programmes like discovery of new genes, gene construct, GM crops, RNAi, gene markers, alleles, high density planting system (HDPS), etc. The Chairman was of the view that the number of projects should be reduced based on priority. He advocated for good planning in cotton research and development to ensure sustainable growth. Dr N. Gopalakrishnan, PC and Head RS, Coimbatore presented the overall progress of the Regional Station and plan of action for the ensuing crop season 2010-11. Action taken report of the last IRC meeting held on February 10-11, 2010 in respect of CICR, RS, Coimbatore was presented by Dr V. S. Nagrare. The IRC confirmed the minutes of last IRC meeting held on 10-11 February 2010. The projects presented by each scientist were critically reviewed by the IRC. The meeting was attended by all the Scientists of Regional Station, Coimbatore.

KVK ROUND-UP

TRAINING ACHIEVEMENTS

Fourteen *on campus* and *off campus* training courses were conducted in different disciplines for 262 practicing farmers, 58 rural youths and 23 extension functionaries. In all 343 participants benefited from the courses.

Discipline	No. of courses	No. of participants			Total
		PF	RY	EF	
Crop Production	3	46	16	-	62
Horticulture	2	24	22	-	46
Plant Protection	3	38	49	-	87
Veterinary Sciences	2	28	-	23	51
Home Sciences	2	33	21	-	54
Extension	2	43	-	-	43
TOTAL	14	262	58	23	343

GROUP DISCUSSION ORGANIZED

1. KVK, CICR, Nagpur organized Group discussion on 'Sucking pest management in cotton' on August 10 and Sept. 10, 2010 at Manori village. Forty cotton growers of Manori & nearby villages participated.
2. KVK, CICR, Nagpur organized a Group Discussion on 'Management of yellow vein mosaic virus in okra' on August 24, 2010 at Manori village. Fifteen okra growers of Manori & nearby villages participated in this discussion.

RESEARCH HIGHLIGHTS

CO₂ evolution and soil enzyme activity in cotton-sorghum vs cotton-fallow cropping system

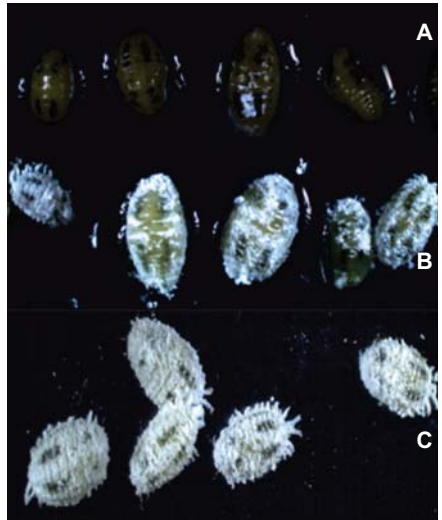
In a mixed red and black calcareous clay loam soil (Vertic Ustropept) of Periyanaickan Palayam series at the Central Institute for Cotton Research, Regional Station, Coimbatore, in an integrated nutrient management study carried out for five years in cotton-fallow and cotton-sorghum system under winter-irrigated cotton showed that the effect of cropping systems was not significant on cumulative CO₂ evolution in a period of 30 days. However, nutrient management significantly influenced the cumulative CO₂ evolution. Application of organic sources of nutrient (farmyard manure @ 15t/ha, RDF + farmyard manure @5t/ha and RDF + sorghum crop residues @ 2.5t/ha) resulted in significantly higher cumulative CO₂ evolution over Control. The recommended dose of fertilizer NPK application was statistically at par with Control with respect to the cumulative CO₂ evolution. Soil dehydrogenase enzyme activity was maximum with 15t FYM/ha. The soil dehydrogenase activity was not significantly influenced by the cropping systems. There was no significant difference among the cropping systems and nutrient management practices with respect to the soil urease activity and soil Fluorescein Diacetate Assay (FDA).

K.K. Kulkarnyopadhyay, N. Gopalakrishnan, K. Velmourugane and C.S. Praharaj

Crude limonene for mealy bug management

Phenacoccus solenopsis was reported as a serious pest on cotton in 2007. Insecticides were being extensively used for its management, but recent studies from CICR have demonstrated that it is a pest best managed without the use of insecticides. Natural enemies play a dominant role in its management in the field.

Use of botanicals as an ecological alternative is now available for mealy bug management. A novel use for the by-product of the citrus industry, namely the citrus peel, was found. Commercially available limonene was tested and reported effective against mealy bugs. Crude limonene was extracted from citrus peels by the cold press method. Crude limonene at 1% with 5% soap nut water (as bio-emulsifier, instead of commercially available soap like Nirma) was sprayed on mealy bug adults. The waxy coating protects the mealy bug from biotic and abiotic factors. Limonene dissolved the waxy coating covering the mealy bug, completely, resulting in its desiccation. The novelty in this technology lies in the use of



A: Mealy bugs treated with 1% crude limonene
B: Mealy bugs treated with 5% soap nut water as control.
C: Untreated control

crude limonene, a byproduct of citrus peels and use of 5% soap nut powder in water as a bio-emulsifier making it a green technology. It is a technology of great relevance to the organic cotton growers. It can also be used for the ecological management of pests that are protected by a waxy coating.

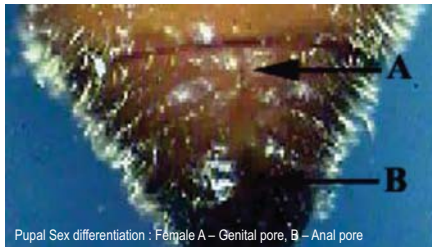
S. Kranthi, R. Nandanwar, N. N. Zade, V. S. Nagrare, C. B. Naik, M.K. Meshram and K. R. Kranthi

Partial RNA sequence characterization of *Xenorhabdus stockiae*, a bacterial symbiont of *Steinernema siamkayai* from Tamil Nadu, India.

Entomopathogenic nematodes belonging to the genera, *Steinernema* and *Heterorhabditis* are widely used for the biological control of insects throughout the world. The infective juveniles of entomopathogenic nematodes are non-feeding and survive in soil for several months. They actively seek out insect host and penetrate through the natural opening or inter-segmental regions. Once inside the insect they regurgitate bacteria inside hemolymph which overcome the insect's immune response and cause lethal septicemia. Recently, wide spread distribution of a native isolate of entomopathogenic nematode, *Steinernema siamkayai* was recorded in the rhizosphere of Bt and non Bt cotton in India. Bacterial symbiont of *S. siamkayai* was isolated from infective juveniles and purified on Nutrient Agar medium supplemented with 0.004% (w/v) triphenyl tetrazolium chloride and 0.0025% (w/v) bromothymol blue at room temperature. Based on nucleotide homology and phylogenetic analysis, bacterial

symbiont of *S.siamkayai* was identified as *Xenorhabdus stockiae*.16S ribosomal RNA gene (partial sequence) of native isolate of *X. stockiae* strain SS was submitted to NCBI (GenBank Accession HM622576).The characteristics of *X.stockiae* are gram negative, rod shaped, highly motile, catalase negative, grow well on Mac Conkey Agar, produce antibiotics, absorbs dye from Bromothymol Blue, do not bioluminescent at dark, grow well at 15,25,28,37 and 42 °C. *X.stockiae* produce both primary and secondary phase variants. Toxin secreted by *X. stockiae* has got insecticidal property and significant mortality was recorded against *Sylepta derogata*, *Helicoverpa armigera*, *Galleria mellonella* and *Corcyra cephalonica* under laboratory conditions. *X.stockiae* also possesses antimicrobial property.

J.Gulsar Banu and N.Gopalakrishnan



Pupal Sex differentiation : Female A – Genital pore, B – Anal pore

Larval Sex differentiation of Pink Bollworm-An easy tool for pairing of adults in mass rearing programmes

Cotton is attacked by many species of lepidopterous insects in different stages of crop growth and the pink bollworm, *Pectinophora gossypiella* (Saunders) is the most widespread pest in almost all cotton growing areas. The moths of this pest are very active fliers, whereas the larvae mostly remain inside the fruiting bodies (squares, flowers and bolls) and cause severe damage. They web the cotton flower petals, imparting a characteristic 'rosette' appearance. Feeding within the boll results in malformation, rotting, premature or partial boll opening, reduction in fiber length and overall reduction in quality of the cotton due to staining of the lint.

Pink bollworm was artificially reared under laboratory conditions on semi synthetic diet at CICR, RS, CBE. The need of determination of sexes based on the external character is essential for the laboratory mass-rearing of insects. The identifying characters of pupae are mainly based on the position of the genital and anal openings. The genital and anal pores are situated mid-ventrally on the 9th & 10th and 8th & 10th abdominal segments in males and females respectively. The distance between the genital pore and anal pore affords a good character for the separation of the sexes. In case of female this distance is more than double as compared to male. Adult moths can be identified by the shape of the abdomen. However, sex determination in the larval stage makes the rearing methodology still easier. Male and female can be differentiated in the larval stage itself based on the presence of a pair of dark coloured testis on the dorsal side of



Larval sex differentiation: Male larvae (Testis enlarged)



Larval sex differentiation: Female larvae

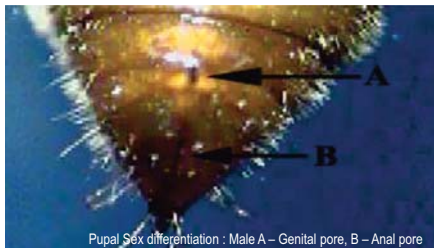
the 7th - 8th abdominal segments of male which is absent in female.

The identifying characters mentioned above for pupa and adult could be observed only with the help of a hand lens or a binocular microscope. As the adults are very swift fliers, separating the two sexes is tedious and time consuming. But in case of larvae, it can be easily identified by seeing it with naked eye. Hence, sex differentiation of pink bollworm can be done easily in the larval stage for pairing of adult moths in the mass rearing programmes.

B. Dhara Jothi, R.Valarmathi, T. Nagarajan and T. Sonai Rajan

Spodoptera exigua - An Emerging Pest of Cotton

Based on reports of occurrence and incidence of *H.armigera* on Bollgard cotton by farmers in some villages around Sirsa, a survey was conducted for its confirmation. Based on survey it



Pupal Sex differentiation : Male A – Genital pore, B – Anal pore



Spodoptera exigua Larva on cotton leaf

was established that by and large the population consists of *Spodoptera exigua* and not *Helicoverpa armigera*. In one field NCS 855 BG-II hybrid from Nuziveedu was sown and only four larvae were recovered and all were of *S. exigua*. All the larvae were observed from the flower but there was no boll damage and leaf damage was also minimal. Adjoining field had Rasi 314 Bt with minor infestation of *Spodoptera exigua*. Field adjoining to it was of Bihani 161 of non-Bt cotton variety which recorded some infestation of *H. armigera* and related boll damage. The majority of larval population received from different locations were identified as *Spodoptera exigua*. The *H. armigera* population was found to be extremely scanty. Usually *Spodoptera litura* can be easily recognized because of its black colour. However, *S. exigua* being greener in colour is liable to be mistaken by the farmers as *H. armigera*. The *S. exigua* lays its eggs in cluster like *S. litura* and has a gregarious feeding phase. There is a possibility that in coming years *Spodoptera exigua* can become potential pest of cotton.

Rishi Kumar, D. Monga and M. Nitharwal

Popular Articles/ Manuals / Folders

- B.Dharajothi, T. Surulivelu and T. R Manjula (2010). "Paruthiyil Orunginaidha Poochikolli Edirpu Mellanmai". Popular article in Tamil published in the extension Bulletin Uzavarin Vallarum Vellanmai, April, 2010 (1) 10, p. 46-47, published by Tamilnadu Agricultural University, Coimbatore.
- B. Dhara Jothi, T. Surulivelu, N. Gopalakrishnan and T.R.Manjula (2010) Mealy Bugs in Cotton and their Management. Folder by CICR, Regional Station, Coimbatore-641003.
- Nalayini, P and Sankaranarayanan, K. (2010). Yield maximization techniques for extra long staple cotton. In: Training manual on "Nutrient and water management in cotton with special reference to ELS and Desi cotton" Published by Central Institute for Cotton research, Regional station, Coimbatore 1-6.
- B. Dhara Jothi, T. Surulivelu, N. Gopalakrishnan and T.R.Manjula (2010). Paruthiyil Mavupoochigal Martum Kattupaduthum Muraigal. Folder in Tamil by CICR, Regional Station, Coimbatore-641003.

VISITS ABROAD

- Dr. K.P Raghavendra Scientist, CICR, Nagpur attended the Bt resistance mechanisms workshop of the Indo-Australian Biotechnology Fund project 'Sustainability of Pyramided Bt genes for Insect Control in Crop Plants' (2008-2011), from June 19 -26, 2010 at the Bio21 Institute for Molecular Biology and Biotechnology at the University of Melbourne, Australia.
- Dr. P.K. Chakrabarty, Head, Division of Crop Improvement attended the International Cotton Genome Initiative Research Conference held at CSIRO Discovery Centre, Canberra, Australia from Sept 20-23, 2010. During the conference he presented a paper entitled Cloning of an unique Chitinase gene in diploid cotton (*Gossypium arboreum*) showed enhanced expression of chitinase activity and delayed pathogenesis of *Myrothecium roridum* (Chakrabarty, P.K., A.V. Narwade, K.S. Mohan, S.B. Nandeshwar, B.B. Kalbande, S.A. Ghuge and A. Qureshi).



Dr. P.K. Chakrabarty Presenting paper at International Cotton Genome Initiative Research Conference

Using conserved as well as degenerate primers a 1.3 kb novel class I chitinase gene unique to *Gossypium hirsutum* was cloned from variety LRA5166 (GenBank # HM 125506). The gene was cloned in pGemT (3.0 kb) and subcloned in the binary vector pBinAR (11 kb). The *G. arboreum* cultivars PA255, PA 402 and RG8 were transformed with chitinase gene by direct-shoot organogenesis. Integration of transgene was confirmed by PCR and Southern hybridization. Bioassay of transgenic cotton against *Ramularia areola* and *Myrothecium roridum*, two major fungal pathogens of cotton showed delayed pathogenesis.

- Dr.S.K.Verma, Senior Scientist also attended the International Cotton Genome Initiative Research Conference held in Australia. He presented two posters in the conference entitled "Development of Mapping Population RILs in diploid cotton (Asiatic cotton)" and "Assessing Genetic Diversity in *Gossypium arboreum* L. cultivars using genomic and EST-derived microsatellites".

HUMAN RESOURCE DEVELOPMENT

1. Shri M.Sabesh, Scientist, Computer Applications attended SAS-Trainers training Programme under NAIP project "Strengthening Statistical Computing" from July 11 to August 14, 2010 at CIFE Mumbai.
2. Dr. B. DharaJothi attended a training programme on

"Taxonomical Identification of Mealy bugs" from Aug.2,2010 to Aug.4,2010, organized by Dr.V.V.Ramamoorthy, Principal Scientist, Division of Entomology IARI ,New Delhi.

WORKSHOP/ MEETINGS ATTENDED

- Dr. K.R.Kranthi, Director, CICR, Nagpur participated and presented lead paper on Transgenic cotton in the Third National Congress on Plant Breeding and Genomics at TNAU, Coimbatore on July 7-9, 2010.
- Dr. K.P.Raghavendra attended the one day partners meet on "Establishment of National Agricultural Bioinformatics Grid (NABG)" in ICAR on August 7, 2010 at NBPGR, New Delhi.
- Dr. Kranthi participated in Directors' Conference Meeting on July 15-16, 2010 at NASC Complex, New Delhi and in the interaction meeting on 'Mechanization in Agriculture' at CIAE, Bhopal on July 23-24, 2010.
- Dr. Kranthi participated in 14th ICAR Industry Meet 2010 at NASC, New Delhi on July 28-29, 2010 and also attended cotton Advisory Board meeting at Mumbai on July 30, 2010.
- Shri S.S Patil (SMS Extn.)attended monthly workshop of State Agriculture Department organized by Superintending Agriculture Officer at Nagpur on August 12, and September 14, 2010.
- Shri.S.S Patil (SMS Extn.) attended ATMA (AMC) meeting at Collector Office, Nagpur on August 24, 2010.
- Dr. P.K.Chakrabarty participated in National Seminar on Whitefly and Thrips transmitted virus. August 27-28, 2010, Delhi University, South Campus, New Delhi and presented paper 'Diversity in Cotton leaf Curl virus isolates prevalent in North West India and approaches to engineer resistance against the disease' by Chakrabarty, P.K., S. Sable, B. Kalbande and D. Monga.
- Dr. Kranthi participated in AICOSCA' Annual General Body Meeting on the occasion of golden Jubilee and his felicitation at Mumbai on Sept. 3, 2010.

PERSONNEL

Superannuation:

Shri W.U.Dupare, Assistant CICR, Nagpur retired from service on Sept. 30, 2010.

JOINING

Mrs. Pratiksha Kashikar joined as Scientist (Biotechnology PS) on probation at CICR Nagpur on Aug. 17, 2010.

Shri M.Saravanan joined at CICR Nagpur as Scientist (Plant Breeding) on probation on Aug. 27, 2010.

Dr. (Mrs.) D.Kanjana joined as Scientist (Soil Science) on probation at CICR RS Coimbatore on Sept. 3, 2010.

Dr. (Mrs.) Anuradha Narala joined as Scientist (Agrl. Economics) on probation at CICR Nagpur on Sept. 17, 2010.

IMPOTANT VISITORS

Dr. Gurbachan Singh Agricultural Commissioner, Govt. of India visited CICR, Nagpur on July 12, 2010. During his visit

Dr. Singh visited the insectary and biocontrol laboratory, Bt referral laboratory, Insecticide Resistance Management Laboratory and tissue culture laboratory. Dr K R Kranthi, Director, CICR, Nagpur explained the activities and the research progress made, especially in pest management with genetically modified cotton and lectins for sucking pest management and development of genetically modified sucking pest resistant cotton varieties. In his address to the scientists, Dr. Singh expressed his appreciation of the progress made by the institute and also the confidence with which the scientists were addressing all the emerging problems that were being faced by cotton farmers of the country.



Dr. Gurbachan Singh with Director CICR in Bt Referral Laboratory



Dr. Gurbachan Singh, Agricultural Commissioner, Govt. of India addressing Scientists of CICR, Nagpur.

CICR website revamped

CICR website (www.cicr.org.in) has been revamped as per ICAR guidelines and numerous pages were added. The contents have been arranged systematically for easy navigation and many search engine optimization tools were incorporated in the portal for better visibility at global level. Separate sub-domain for AICRP on cotton (www.aicrp.cicr.org.in) and TMC (www.tmc.cicr.org.in) projects were created. All Cotton stakeholders are requested to visit the web site and contribute valuable cotton information to the portal for future updation. Cotton related News and Views may kindly be sent by post to Project Coordinator (Cotton) & Head, Central Institute for Cotton Research, Regional Station, Lawley Road, Coimbatore-641 003 and also through email to cicrbe@gmail.com.

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Central Institute for Cotton Research
Central Institute for Cotton Research
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Home Institute Research AICRP TMC M&M N&P Media Resources

Shaping Indian cottons scenario

ICAR (Indian Council for Agricultural Research) has been set up in 1952, used to sponsor cotton research activities on all levels based on the work of the Committee was taken over by the Indian Council of Agricultural Research (ICAR). The ICAR assumed the All India Coordinated Cotton Improvement Project (AICRP) in the year 1967 with its headquarters at Coimbatore. [Text continues with details of the project's history and objectives.]

Recommendations & Events **AICRP on Cotton** **Cotton News and Views**

ICAR TMC Project 2010-11
Breeding Technology
Genotyping Technology
New 500 High Yielding Cottons
New 500 High Yielding Cottons
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New 500 High Yielding Cottons

AICRP
All India Coordinated Cotton Improvement Project
Central Institute for Cotton Research

Home Institute Research AICRP TMC M&M N&P Media Resources

disseminating technologies to improve

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A Value Chain for Cotton Fiber, Seed and Stalks
An Innovation for Higher Economic Returns
to Farmers and Allied Stake Holders

Production to Consumption System Research - Component 2
National Agricultural Innovation Project
Indian Council of Agricultural Research, New Delhi

Conservation Partners
[List of partners and their roles]

Research into Development of Decision Support Systems for Insect Pests of Major Rice and Cotton based Cropping Systems

National Agricultural Innovation Project (NAIP-ICAR), New Delhi
Theme Area : Integrated Pest Management (IPM)
NAIP - Component 4 : Basic and Strategic Research, Reg. No. of the proposal: C 2046

Conservation Leader : Central Institute for Cotton Research, Coimbatore
[Contact information]

Objectives of the sub-project
[List of objectives]

Project Description
[Detailed description of the project's goals and methods]

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