



# COTTON Innovate

Weekly Newsletter of Central Institute for Cotton Research, Nagpur

## SCIENTIFIC TALKS

### LIBRARY CLUB TALKS

Dr. Gautam Majumdar, Scientist, Farm Machinery & Power, delivered a library talk on "Insect Farmers" on 13th September, 2013. He emphasized the use of the algorithms, Ant Colony Optimization and Particle Swarm Optimization (imitated from foraging of foods by ants and birds' flocking) in the automation of agricultural operations. Earlier Robots were built which were too huge, complex and costly. Now mini robots are being built which are lighter, simpler, low cost and suitable for agricultural operations because of their low or no compaction of soil. These robots e.g. Prospero are precise and can work in swarms using swarm intelligence, infrared communication. Swarm intelligence has been found to be cheap, simple and robust. At present Prospero can precisely plant seeds in swarms. Next phase will be Tending and third phase will be Harvesting. Fourth phase of the project Prospero will be amalgamation of all the three phases into one autonomous robot capable of doing all the operations of agriculture in swarms.



### INNOVATION CELL - WILD IDEA

Dr. Blaise, Head, Division of Crop Production, gave a wild idea on "Alternate Approach to Improve Fertilizer Use Efficiency (FUE)" on 13th September, 2013. Presently, FUE is less than 50%. In cotton alone, about 1.2 million tonnes of urea is lost annually. Hence, improving FUE is a top priority. Chemical interventions recommended for improving use efficiency are slow release nitrogenous fertilizers, use of nitrification inhibitors, and/or use of urease inhibitors. However, these have not found favour with farmers because of their prohibitive cost or non availability. The methods that farmers adopt are band and split application of fertilizers. Dr. Blaise opines that "Fixed row high density planting" could be an alternate approach to improve FUE and further increase productivity of the HDPS. Application of fertilizers in a fixed row, year after year, would probably result in enriching the narrow band. On a long-term, it could result in lowering fertilizer application rates, improve use efficiency and a possibility to make the inter row space weed free.



## RESEARCH ROUND-UP

'Cotton as a model cell' for research on lignin biosynthesis and polymerization.

Lignin is a polyaromatic macromolecule, widely used as a raw material for value added products in paper and petroleum industries with a reported worldwide production of approximately 100 million tonnes/year. Cotton is a highly useful agricultural model to study lignin biosynthesis, deposition, monolignol transport and polymerization, and biological functions. As much as 20% of the mature cotton stem and root may be of lignin. The synthesis of lignin has been studied as an active defense response in cotton against *Verticillium dahlia*. The S/G ratio of syringyl (S) to guaiacyl (G) units in cotton lignin varies with age, species and infection by microorganisms. G-lignin in cotton stems has been implicated with pathogen defense and cottonstalk (stem) material contains both G- and S-lignin.



*Gossypium barbadense* has a predominance of syringyl units, whereas *Gossypium hirsutum* contains mostly guaiacyl units. Different cotton cells with secondary cell walls deposit very different levels and types of lignin; for example fibres deposit virtually no lignin while much of the biosynthetic machinery is expressed in seed fibres and stems. From a functional perspective, the study of cotton lignin biology in vivo may give strong insights into spatial and temporal variation of lignin deposition as cotton seed fibres deposit virtually no lignin in their cell walls and provide further avenues for the elucidation of lignin biosynthesis and its cellular plasticity which is operated in planta.

Jayant Meshram (Plant Physiology)



Pest identification

## ONE DAY TRAINING ON HDPS ORGANIZED

CICR has organised one day training on 10th September 2013 on pest assessment and management in the trials on HDPS implemented in 10 districts (Nagpur, Wardha, Chandrapur, Amaravati, Yavatmal, Akola, Buldhana, Washim, Nanded and Jalgaon) of Maharashtra during current season. Altogether 105 trainees participated in the training that comprised of 74 Agriculture officials, 27 pest scouts, 2 SRFs and 2 farmers. Dr K.R. Kranthi, Director gave a brief account on HDPS implementation in Maharashtra by CICR in coordination with state agriculture departments and Krishi Vigyan Kendras (KVKs). Dr V.S. Nagrare, Sr Scientist, Agricultural Entomology and Dr Sandhya Kranthi, Head Crop Protection Division explained how to identify insect pests, biocontrol agents and diseases and ETL based management strategies. Twelve CICR Scientists and 7 technical officers designated as district coordinators from CICR also participated in the training and replied to the queries raised by the participants. The training was coordinated by Dr V. S Nagrare.



Answering queries/doubts by CICR Scientists

## HUMAN RESOURCE DEVELOPMENT

Dr. V. Chinna Babu Naik, Scientist, Entomology, CICR, Nagpur and Dr. Rishi Kumar, Senior Scientist, Entomology, CICR Regional Station, Sirsa had attended a short course on "Detection and management of insecticide resistance" including molecular aspects of insect pest management, held at National Bureau of Agriculturally Important Insects (NBAII), Bengaluru, from Sept. 2-11, 2013.

## MEETINGS

Hindi Committee meeting was convened on Sept. 11, 2013. Preliminary meeting regarding National Agricultural fair-Vasant Expo 2013 -14 was held at CICR, Nagpur on Sept. 13, 2013.



A gathering of trainees



Pest scouting in field

## VISITORS

A six member Ethiopian Research Team (Dr. Belayneh Admassu Yimer, Mr. Kefyalew, Mr. Miesso Hembra Roba, Mr. Sherif Aliy Geda, Dr. Tebkew Damte Belete, and Mr. Seyoum Mengistu Tsegaye) visited CICR, Nagpur on Sept. 12, 2013 and had interaction session with scientists.



Students of 11th and 12th standard from Centre Point School, Wardhaman Nagar visited CICR, Nagpur on 13th September, 2013. Students were excited to see plant tissue culture set up, the test tube plants of cotton, DNA, and other facilities. They had basic queries on molecular biology and biotechnology which were clarified by scientists from Biotechnology section.



**Produced by Dr. K.R.Kranthi, Director, CICR, Nagpur**

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