

10.3: Consultancy, Patents, Commercialization of Technology

Patent:

A complete patent application was submitted by Dr. A.R. Raju on "Bt Cotton Leaf Reddening Prevention Kit 1-5 Series" (Filling under process).

Revenue Generation

Particular	Amount (Rs.)
Sale of farm produce	29,74,381
Licence Fee	2,95,750
Application fee from candidates	1,05,000
Interest earned loans & advances	5,01,769
Miscellaneous Receipts	25,70,723
Total	64,47,623

MoU signed:

- ICAR-CICR has signed MoU with IFFCO on 25th July 2017 for a sponsored project on "Validation of impact of inputs on economics of Bt-Hybrid cotton + pigeon pea strip cropping".
- ICAR-CICR has signed MoU with M/s. Smartchem Technologies Ltd., Mundhwa, Pune on 16th Aug. 2017 for a sponsored project on "Validation of CNS fertilizer grade mixture subsidiary companies inputs in Bt Hybrid cotton".
- ICAR-CICR has signed a tri-party MTA with UAS, Dharwad and NRCPB, New Delhi on 18th Aug. 2017 for "Testing and introgression of the transgene contained in event 'UASD Event No 78' into varieties and hybrids of cotton".
- ICAR-CICR has signed MoU with National Remote Sensing Centre, Hyderabad on 20th Dec. 2017 for a collaborative project on "Quantitative estimation of carbon and moisture fluxes over the cotton based agro eco system: Integrating ground observation, satellite data and modelling".
- MoU was signed between ICAR-CICR, Nagpur and M/s. Bharat Seeds on 1st March 2018, for Commercialization of CICR varieties viz., CSH-3075 and CSH-3129.
- MoU was signed between ICAR-CICR, Nagpur and M/s. Maharashtra Hybrid Seed Co. Pvt. Ltd on 7th March 2018 for collaborative project on "Monitoring for shifts in susceptibility in populations of the cotton boll worms viz., *Helicoverpa armigera* and

Pectinophora gossypiella and leaf eating caterpillar (*Spodoptera litura*) against *Cry2Ab* and *Cry1Ac* + *Cry2Ab* Protein in various cotton growing regions of the country"

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10.4 : Significant Decisions of RAC, IRC, PMC

Research Advisory Committee Review Meeting

The first meeting of the reconstituted Research Advisory Committee (RAC) of ICAR-Central Institute for Cotton Research (CICR), Nagpur was held from 4-5 January 2018 under the Chairmanship of Dr. C.J. Dangaria, Hon'ble Vice Chancellor, Navsari Agricultural University, Navsari. The following RAC members and officials attended the meeting:

- Dr. R.K. Singh, Assistant Director General (Commercial Crops), ICAR, New Delhi and Member, RAC
- Dr. S. V. Sarode, Ex Director Research, Dr. PDKV, Akola and Member, RAC
- Dr. A. J. Shaikh, Ex-Director, Central Institute for Research on Cotton Technology, Mumbai and Member, RAC
- Dr. S. S. Patil, Ex-Senior Cotton Breeder & Professor, Dept of Genetics & Plant Breeding, UAS, Dharwad and Member, RAC
- Dr. G. Ravindra Chary, Project Coordinator (Dryland Research), AICRPDA, Hyderabad and Member, RAC
- Dr. V.N. Waghmare, Director (Acting), ICAR-CICR, Nagpur
- Dr. A.H. Prakash, Project Coordinator (Cotton) & Head, ICAR-CICR, Regional Station, Coimbatore
- Dr. D. Monga, Head, ICAR-CICR, Regional Station, Sirsa
- Dr. M.V. Venugopalan, Principal Scientist, ICAR-CICR, Nagpur and Member Secretary, RAC
- Dr. K.P. Raghavendra, Scientist, ICAR-CICR, Nagpur - Rapporteur
- Dr. K. Velmourougane, Scientist, ICAR-CICR, Nagpur - Rapporteur

At the outset, Dr. M.V. Venugopalan, Member Secretary, introduced the Chairman and members of the RAC and Dr. V.N. Waghmare, Director (Acting), ICAR-CICR extended a formal welcome. After the introductory remarks by the Chairman and Members of RAC, Dr. M.V. Venugopalan presented the Action Taken Report on the recommendations of the last RAC meeting



RAC members visiting the experimental fields

On 5th January, 2018 the members of RAC visited the experimental fields, bio-control laboratory and poly-house facilities. A joint interaction session with all the scientists was held where the scientists expressed their views on the current problems and researchable issues on cotton.

Based on the presentations and discussions, field visits, laboratory visits and interaction with the scientists, the committee made the following specific recommendations:

1. Wild species garden maintained at ICAR-CICR is a diverse treasure for several genes imparting stress tolerance and fibre quality. A special programme on development of pre-breeding materials can be taken up using wild species so that valuable traits that are hidden in wild species can be utilized.
2. Irrigation using structured has been shown to improve yield of cotton. All the scientific data right from the point of field delivery of structured water to the soil and in the plant system should be generated so that the precise reasons for yield improvement could be elucidated
3. Impact of extreme climatic events on cotton and pest damage in relation to abiotic factors for past 30 years needs to be studied as a project. Studies on climate change/variability on production, productivity, pest dynamics on irrigated/rainfed cotton

held on 1-2 Dec 2016 and the same was accepted. Dr. V.N. Waghmare, Director ICAR-CICR presented the cotton scenario and the salient achievements of the institute during the 12th Plan period. Later, the Heads of the Divisions and Regional Stations presented the research highlights of their respective Divisions/ Stations.



Dr. C. J. Dangaria, Chairman, RAC conducting the proceedings

- production system can be studied.
4. ICAR-CICR has developed a number of drought tolerant lines in the past. These drought tolerant lines identified in all the earlier programme needs to be utilized in regular breeding programmes of the institute.
5. Diploid cotton is hardy and is known to perform well under adverse soil conditions. The diploid (*G arboreum*) cotton should be tried for their adaptability and performance on calcareous soils
6. The profits of cotton farmers are ultimately linked to the prices realized. Research on market intelligence for benefit of the farmers to forecast the price at pre-sowing, pre-harvest and post harvest to be formulated on priority
7. Pink boll worm has gained resistance to Bt toxins in several areas of central and south India. Genetic diversity and population structure of Pink Bollworm needs to be studied in order to understand the differential nature of resistance among the PBW populations of north, central and southern India.
8. Infestation period, race diversity and microclimatic data of PBW need to be studied and to be utilized for design of management strategy to control PBW. Research may be intensified for investigation of intrusive and extrusive factors responsible for occurrence, severity, spread and damage due to PBW.

9. Push Pull strategy / molecules which attract the female moths for egg laying should be identified and formulated to address the Pink Boll-worm problem. Research on the deployment of semiochemicals/kairomones/oviposition deterrents for the management of pink bollworm may be prioritized.
10. Minicore collection group of germplasm of *G. hirsutum* and *G. arboreum* should be generated based on the morphological as well as molecular marker data.
11. Gene based marker should be explored for fibre quality traits and their utilization in MAS.
12. GVS lines procured from USA are being used for crossing to incorporate CLCuV tolerance. The progenies must be tested for their reaction to sucking pests.

RAC meeting concluded with a vote of thanks proposed by Dr. D. Blaise, Head I/c, Division of Crop Production, ICAR-CICR, Nagpur.

Institute Research Committee (IRC) meeting 2017

The Annual Institute Research Committee (IRC 2017) meeting of CICR was held on 1-3 April 2017 at CICR, Nagpur. Dr M.S. Ladaniya, Director (Additional Charge) CICR Nagpur chaired the meeting. Dr V.S. Nagrare Secretary IRC welcomed all dignitaries and scientists. Chairman in his introductory remarks, mentioned that research should be focused on strategic and basic aspects which would be the basis to support farmers of this country. He narrated some of the issues like resistance in pests against Bt-cotton that emerged in the recent years. Dr MS Kairon Ex- Director ICAR-CICR invited expert expressed concern over of increased cost of production. He mentioned that production increased



to more than 400 lakh bales; however, net profit of farmers has not gone up. He appreciated the HDPS initiative. He suggested re-establishment of permanent manurial/rotation trials at all sites. He mentioned that labour cost has gone very high and every operation now has become costly which needs switching over to mechanization and diversification. He mentioned that before independence, majority area was under desi cotton but now >98% area is under hirsutum hybrids. This condition favours the risk of outbreak of pests and diseases in case of hybrids. Dr S. V. Sarode Ex-Director of Research (Dr PDKV, Akola) another invited expert, remarked that scientific findings should lead to recommendations. He exhorted that research should not be of only academic interest and it should have some practical utility. He expressed concern on depletion of natural resources like water and soil. All the Heads of the Divisions and Regional stations made a brief mention on research activities being carried out and the outcome of pre-IRC meetings held at respective Divisions and Regional stations. Dr M.V.Venugopalan presented the recommendations of Research Advisory Committee meeting held on 1-2 December 2016. Dr Vinita Gotmare presented the report of Research Framework Document (RFD) of the Institute. Dr V. S. Nagrare presented the Action Taken Report of the IRC 2016. New projects were discussed at length and completed & ongoing projects were reviewed critically. On this occasion IRC felicitated Dr N. Gopalakrishnan, Principal Scientist (Plant Biochemistry) CICR RS Coimbatore & EX ADG (Cash Crops) ICAR, who was due to be superannuated in the month of May 2017. Dr N. Gopalakrishnan presented life time achievements. Scientists from CICR, Nagpur, CICR RS Coimbatore and CICR RS Sirsa who attended the meeting took active part in discussions, finalization of projects and preparing the plan of work for 2017-18. A Booklet "Technologies generated from the Regional station during the past decade for the benefit of farmers (Hindi)" a publication by CICR RS Sirsa, Haryana was released at the hands of Chairman, IRC. In concluding remarks, Dr Sarode requested the scientists to take suggestions of the house in right spirit. He stressed on the need for discussing any technical programme thoroughly in the pre IRC meetings so that concrete programme can be designed. Dr M.S. Kairon suggested testing the technology at farmer's field to get correct feedback. In concluding remarks, Dr Ladaniya suggested following points for strict compliance.

- All the germplasm accessions should be properly maintained at institute as well at NBPGR.

- Breeding projects must include scientists from Pathology/ Entomology/ Agronomy.
- Biotechnology scientists should work in close association with the breeder.
- Socio-economic problems and impact of our technologies with relevance to cotton cultivation need to be studied.
- More emphasis should be given to utilize mechanical harvester due to low labour availability and high efficiency
- Design gene constructs for particular trait in relation to biotic and abiotic stress.
- Desi cotton with long staple to be evaluated thoroughly under HDPS.
- Registration of the Biopesticides and botanicals developed by the institute.
- Exploiting early maturing varieties to overcome pink bollworm infestation in cotton.
- Priority to be given to pheromone technology, preparing diagnostic kits (LAMP) and other ecofriendly approaches for cotton pest management
- He cautioned the scientist against pre-mature disclosure of information to the press and other media.

Dr V. S Nagrare, Secretary IRC and Dr J. H. Meshram Joint Secretary IRC coordinated the meeting.

Institute Research Committee (IRC) meeting 2018

The Annual Institute Research committee (IRC) meeting of ICAR-CICR was conducted as a combined IRC for CICR, Nagpur and CICR, RS, Sirsa from 22-24 March 2018 at CICR, Nagpur. Dr V.N. Waghmare, Director, (Acting) chaired the meeting. Dr M.V. Venugopalan, Incharge PME Cell and Member Secretary, Research Advisory Committee (RAC) presented the recommendations of RAC meeting held on 4-5 Jan 2018. Dr. K.Velmourougane, Secretary IRC presented the Action Taken Report of the previous IRC (2017). The IRC confirmed the minutes of the last IRC meeting.

The Chairman in his introductory remarks praised the remarkable contributions made by the scientists of CICR in Cotton Research and Development especially in creating awareness on pink bollworm and its management. He also applauded the scientist's role in analysis and documentation of Roundup Ready (RR Flex) or BG II (herbicide tolerant cotton) problem in cotton growing regions of India. Director urged all the scientists to address the new challenges in cotton production.

The IRC felicitated Dr S.L.Ahuja, Principal Scientist (Plant Breeding) CICR, RS, Sirsa who was due for his superannuation in the month of April 2018. Dr S.L.Ahuja presented his lifetime achievements in cotton research before the house.

Dr. K. Velmourougane, Secretary IRC and Dr. Dipak Nagrale, Joint Secretary IRC coordinated the meeting.

Project Monitoring and Evaluation Committee (PMEC)

The Project Monitoring and Evaluation committee (PMEC) meeting was held on 23rd September, 2017 at ICAR-CICR, Regional Station, Sirsa, Haryana, under the Chairmanship of Dr. V. N. Waghmare, Director (Acting) of ICAR-CICR, Nagpur. Dr. M.V. Venugopalan (Member Secretary), Dr. Nandini Gokte Narkhedkar, Dr. Punit Mohan and Dr. Vinita P. Gotmare members of the PMC were also present. Dr. Dilip Monga Head, ICAR-CICR-RS and all the scientific staffs namely, Dr. S. L. Ahuja, Dr. Ramavatar Meena, Dr. Om Prakash Tuteja, Dr. S. K. Verma, Dr. Rishi Kumar, Dr. Satish Kumar Sain and Dr. Amarpreet Singh presented their Institutional Research project activities. Each project activity was explained and discussed by their respective PI & Co-PI in detail. The field, Poly house and laboratory experiments being conducted at ICAR-CICR, Regional Station, Sirsa were visited and monitored by the PMEC members. PME Committee gave certain recommendations for improving the research programmes.

Dr. V.N. Waghmare, Director (Acting) of ICAR-CICR, Nagpur appreciated the research activities being undertaken by the scientists of ICAR-CICR, Regional Station, Sirsa, Haryana. The meeting ended with a vote of thanks by Dr. Dilip Monga, Pr. Scientist and Head, ICAR-CICR, Regional Station, Sirsa, Haryana.

