



10.1 List of Publications

Research papers published in refereed Journals

1. Banu J.G. (2013). Effect of different storage conditions on spore viability of *Lecanicillium lecanii* formulations and infectivity to mealybug, *Paracoccus marginatus*. *International Journal of Plant Protection*, 6(2): 334-337. (NAAS Rating: 3.3)
2. Banu J.G. (2013). Effect of solid substrates on growth and sporulation of *Lecanicillium lecanii* and pathogenic activity to Mealy Bug. *Annals of Plant Protection Sciences*, 21(1): 208-209. (NAAS Rating: 3.7)
3. Bhattacharyya T., Pal D.K., Mandal C., Chandran P., S.K.Ray, Sarkar Dipak, Velmourougane K., A. Srivastava., Sidhu G.S., Singh R.S., Sahoo A.K., Dutta D., Nair K.M., R. Srivastava., Tiwary P., Nagar A.P. and Nimkhedkar S.S. (2013). Soils of India: Their historical perspective, classification and recent advances. (Review article) *Current Science*, 104 (10), 1308-1323. (NAAS Rating :7.4)
4. Blaise D., Venugopalan M.V., Singh J.V., Raju A.R. (2013). Fertilizer best management practices in cotton. *Indian Journal of Fertilisers*, 4 (2): 110-119. (NAAS Rating :3.8)
5. Dhamayanthi K.P.M., Rathinavel K. and Gotmare Vinita (2013). Induction of polyploidy in wild cotton species (*Gossypium armourianum* and *G. aridum*) by colchicine treatment. *Journal of Cotton Research and Development*, Vol 27 (2): 165-170. (NAAS Rating:4.3)
6. Dhamayanthi K.P.M. and Rathinavel K. (2013). Studies on flowering behavior and fruiting pattern of early maturing germplasm lines of Egyptian cotton (*G. barbadense* L.). *Cotton Research Journal*, 5 (2):150-157. (NAAS Rating :2.6)
7. Gotmare V., Mohan P., Balasubramani G., Rodge C., Katre M., Tule B.N., Chakrabarty P.K. and Kranthi K. R. (2013). NISC 40(IC0584261; INGR13033), NISC 40(IC0584262; INGR13034), NISC 40(IC0584262; INGR13035) (2013) Jassid tolerant compact plant type introgressed derivatives of Cotton. *Indian Journal of Plant Genetic Resources*, Vol 26(3): 253 – 254. (NAAS Rating :3.0)
8. Gotmare V., Mohan P., Balasubramani G., Waghmare V.N., Rodge C., Katre M., Tule B.N., Chakrabarty P.K. and Kranthi K.R. (2013). Vaidehi 95 (MSH 53) (IC0584260; INGR13032) dark brown linted introgressed derivative of cotton. *Indian Journal of Plant Genetic Resources*, Vol 26(3): 252-253. (NAAS Rating :3.0)
9. Hebbar K.B., Venugopalan M.V., Prakash A.H. and Aggarwal P.K. (2013). Simulating the impacts of climate change on cotton production in India. *Climatic Change*, 118(3-4):701-713. (NAAS Rating :7.9)
10. Kranthi K.R., Venugopalan M.V. and Yadav M.S. (2012). Hybrid cotton revolution in India. *Seed Times*, Vol. 5(4): 29-38.
11. Kumar R., Nagrare V. S., Nitharwal Mukesh, Swami Dinesh and Prasad Y. G. (2013). Within-plant distribution of an invasive mealybug, *Phenacoccus solenopsis*, and associated losses in cotton. *Phytoparasitica*, DOI 10.1007/s12600-013-0361-6. (NAAS rating 7.3)
12. Meena, R.A., Monga D. and Ghanshyam (2013). Economics of GMS based *Desi* cotton (*Gossypium arboreum*) hybrid seed production in north zone. *Journal of Cotton Research and Development*, 27(2): 175-178. (NAAS Rating :4.3)
13. Meena, R.A., Monga D. and Neha (2014). Studies to enhance cotton plant stand under north zone. *Journal of Cotton Research and Development*, 28(1): 12-17. (NAAS Rating :4.3)
14. Mukherjee, A.K., Kumar Sampath, Kranthi S. and Mukherjee P.K. (2013). Biocontrol potential of 3 novel *Trichoderma* strains: isolation, evaluation and formulation. *3 Biotech* 10 1007/s 13205 013.
15. Mukherjee, P.K., Mukherjee A.K. and Kranthi S. (2013). Reclassification of *Trichoderma viridae* the most widely used commercial biofungicide in India, as *Trichoderma asperelloides*. *The open Biotechnology journal*, 7:7-9.
16. Nalayini P., Sankaranarayanan K. and Velmourougane K. (2013). Herbigation in cotton (*Gossypium spp*): Effects on weed control, soil microflora and succeeding greengram (*Vigna radiata*). *Indian Journal of Agricultural Sciences*, 83(11):1144-8. (NAAS Rating :6.6)

17. Raghavendra K.P., Sheeba, J.A. and Santosh H. B. (2013). Sucrose synthase, a major biomarker for sink strength in cotton. *Cotton Research Journal*, 5 (2):158-172. (NAAS Rating :2.6)
18. Raju A.R. (2013). Impact of insect resistant cotton. *IOSR Journal of Agriculture and Veterinary Science*, (IOSR-JAVS) 5 (2): 13-25.
19. Raju A.R. (2013). Seed bacterization with Azotobacter, PSB and foliar application of urea on drought affected cotton. *Int. J. Curr. Microbiol. App. Sci.*, 2 (10): 44-51.
20. Raju A.R. (2014). Improving hybrid cotton profitability and micronaire with stripcropping of soybean+pigeon pea with conservation furrows, Mn and B application. *African Journal of Agricultural Research*, 9 (2): 183-195. (NAAS Rating :6.0)
21. Raju A.R., Majumdar G. (2013). Evaluation of Portable Cotton Picker. *International J of Agricultural Innovations & Research*, 2 (1): 104-107.
22. Raju, A.R., Thakare S., Majumdar G., Bharambe P.R. (2013). Risk aversion in shallow soils with innovative intercropping systems. *Journal of Cotton Research and Development*, 27 (1): 37-44. (NAAS Rating :4.3)
23. Raju, A.R., Thakare S.K. (2013). Profitability and FUE of Bt cotton based intercropping systems under changing rainfall patterns in Vertisols of India. *African Journal of Agriculture Research*, 8 (24): 3177-3185. (NAAS Rating :6.0)
24. Rani, U. S., (2013). Participation, decision making and drudgeries faced by women in cotton cultivation. *Journal of Extension Education*, Vol.25 (3): 5078-5085. (NAAS Rating :2.7)
25. Rani, U.S. and Selvaraj G. (2013). Bt cotton in Tamil Nadu: An evaluation of farmers' experiences. *Indian Research Journal of Extension Education*, 13 (3): 64-70. (NAAS Rating :3.5)
26. Rani, U S. and Nayalini P. (2013). Sustainability of diversified and non-diversified cotton farms in Tamil Nadu – An empirical analysis", *Cotton Research Journal*, 5 (2): 194-200. (NAAS Rating :2.6)
27. Santhy, V., Palve S.M., Virkhede Sonali, Mohan Pratibha, Khadi B.M. (2013). Characterization and genetic inheritance of temperature sensitive genetic male sterility in *Desi* cotton (*Gossypium arboreum*). *Indian Journal of Agricultural Sciences*, 83 (8): 809-14. (NAAS Rating: 6.6)
28. Singh J., Babar Shilpa and Venugopalan M.V. (2013). Interactive effect of moisture conservation and integrated nutrient management on yield and nutrient utilization efficiency of rainfed Bt cotton (*Gossypium hirsutum*). *Indian Journal of Agricultural Sciences*, 83 (10):1069-74. (NAAS Rating: 6.6)
29. Singh, J., Abraham Shalu and Sankaranarayanan, K. (2014). Impact analysis of Bt cotton production technologies on yield and profit of Vidharbha farmers. *Journal of Cotton Research and Development*, 28 (1): 62-65 (NAAS Rating: 4.3)
30. Rao, S., Kumar Dinesh S., Das S.N., Nagaraju M. S. S., Venugopalan M.V., Rajankar P., Iaghat P., Reddy M. S., Joshi Sharma (2013). Modified dubois model for estimating soil moisture with dual polarized SAR data. *Journal of the Indian Society of Remote Sensing*, 41 (4): 865-872. (NAAS Rating: 6.7)
31. Tiwary P., Venugopalan M.V., Blaise D., Chatterji S., Sen T.K. and Tandulkar N.R. (2013). Evaluation of sustainability of rainfed cotton yield under conventional and intergrated nutrient management practices. *Agropedology*, 23(1): 53-58. (NAAS Rating: 2.9)
32. Tuteja O.P. (2014). Studies on heterosis for yield and fibre quality traits in GMS hybrids of upland cotton (*Gossypium hirsutum* L.). *Journal of Cotton Research and Development*, 28 (1): 1-6 (NAAS Rating: 4.3)
33. Tuteja O.P. and Agrawal Manish (2013). Heterosis for seed cotton yield and other traits in GMS based hybrids of American cotton (*Gossypium hirsutum*). *Journal of the Indian Society for Cotton Improvement*, 5 (2): 131-141. (NAAS Rating: 2.6)
34. Tuteja O.P. and Banga Manju (2013). Combining ability estimates for yield and quality characters of parents and crosses based on genetic male sterility in cotton (*Gossypium hirsutum*). *Indian Journal Agricultural Sciences*, 83 : 987-91. (NAAS Rating : 6.6)
35. Velmourougane K. and Sahu Apeksha (2013). Impact of transgenic cottons expressing *cry1Ac* on soil biological attributes. *Plant, Soil and Environment*, 59 (3): 108-114. (NAAS Rating: 7.5)
36. Velmourougane K., Venugopalan M.V., Bhattacharyya T., Sarkar Dipak, Pal D.K., Sahu Apeksha, Chandran P, S.K. Ray, Mandal Champa, Nair K.M., Prasad Jagdish, Singh R.S., Tiwary Pramod (2013). Urease activity in various agro-ecological sub regions of black soil regions in India.

- PNAS, India, Sec. B Biol. Sci.*, 83 (4): 513-524. (NAAS Rating: 6.1)
37. Velmourougane K., Venugopalan M.V., Bhattacharyya T., Sarkar Dipak, Pal D.K., Sahu Apeksha, Chandran P, S.K. Ray, Mandal Champa, Nair K.M., Prasad Jagdish, Singh R.S., Tiwary, P.,(2013). Microbial biomass carbon in agro-ecological sub regions of black soil in India. *PNAS, India, Sec. B Biol. Sc.*, DOI 10.1007/s40011-013-0238-y. (NAAS Rating: 6.1)
38. Velmourougane K, Venugopalan M.V, Bhattacharyya T, Dipak Sarkar, Pal D.K, Apeksha Sahu, Ray S.K, Nair K.M, Jagdish Prasad, Singh R.S. (2013). Soil dehydrogenase activity in agro-ecological sub regions of black soil regions in India. *Geoderma*. (197-198): 186-192. (NAAS Rating: 7.7)
39. Velmourugane K., Venugopalan M.V., Bhattacharyya T., D. Sarkar., Pal D.K., Sahu A., Chandran P., Ray S.C., Mandal C., Nair K.M., Prasad J., Singh R.S. and Tiwary P. (2013). Microbial biomass C status in Agro ecological sub regions of black soils in India. *Proc. Matl. Acad. Sci. India, Sect B. Biol. Sci.*, DOI 10.1007/540011-013-0238-y. (NAAS Rating: 6.1)
40. Vennila S., Agarwal Meenu, Nagrare V. S., Prasad Y. G., Prabhakar M. (2014). Ornamental hosts of cotton mealybug (*Phenacoccus solenopsis*). *Indian Journal of Agricultural Sciences*, 84(1):161-163. (NAAS rating: 6.6)
41. Venugopalan M.V., Kranthi K.R., Blaise D., Lakde Shubhangi and Sankaranarayana K. (2013). High density planting system in cotton - The Brazil Experience and Indian Initiatives. *Cotton Research Journal, ISCI*. 5(2):172-185. (NAAS Rating :2.6)
42. Verma S.K., Tuteja O.P. and Monga D. (2013). Studies on stability parameters and sustainability index for selecting stable genotypes in Asiatic cotton (*Gossypium arboreum*). *Indian Journal Agricultural Sciences*, 83 (12): 1377-80. (NAAS Rating :6.6)
43. Wasnik S. M. (2013). Study on antecedents of cotton growers alienation from land in distress vidharbha region of Maharashtra. *International J. of Exten Edu.*, 9: 56-60. (NAAS Rating :2.9)
44. Wasnik S.M., Raju A.R., Palve S.M., Majumdar G., Parwate P.P. (2013). Technology interventions performance under front line demonstrations in Bt hybrid cotton (*Gossypium hirsutum L.*); *Journal of Cotton Research and Development*, 27 (1): 126-133. (NAAS Rating :4.3)

10.2 List of On-going Projects

No.	Name of project
1.	Collection, conservation, evaluation, documentation and maintenance of germplasm of cultivated species of <i>Gossypium</i> . (Dr. Punit Mohan (PL), Dr. S.Manickam, Dr. R.A. Meena, Mrs. Chakrabarty, Dr. KPM. Damayanthi)
2.	Improvement of tetraploid and diploid cottons for fibre properties through population improvement approaches. (Dr. V.N. Waghmare (PL), Dr. Vinita Gotmare, Dr. O.P.Tuteja)
3.	Fine mapping of fiber quality and economic traits using RILs in diploid cotton. (DBT) (Dr. V.N. Waghmare (PL), Dr. T.R. Loknathan)
4.	Fine mapping and advance backcross QTL analysis of fiber quality and economic traits in diploid cotton. (Dr.V.N. Waghmare (PL))
5.	Development of saturated genetic linkage map for <i>Gossypium hirsutum L.</i> using SSR and SNP markers. (DBT) (Dr. V.N. Waghmare (PI), Dr. Punit Mohan)
6.	Conservation, characterization and utilization of wild species, races of cultivated species and synthetic polyploids of <i>Gossypium</i> . (Dr.Vinita Gotmare (PL), Dr. Balasubramani)
7.	MAS/MAB for Water-logging in Cotton. (Dr.Vinita Gotmare (PL), Dr. SESA. Khade, Dr. M. Saravanan)
8.	Breeding of upland cotton for improved fibre quality and resistance to biotic stress (bollworms and jassid). (Dr. S.M. Palve (PL))
9.	Development of heterotic pool for superior medium staple in tetraploid cotton (<i>G. hirsutum</i>). (Dr.S.M. Palve (PL))

10.	Development of drought tolerant genotypes with good fibre quality in <i>G. hirsutum</i> . (Dr. Suman Bala Singh (PL), Dr. A.H. Prakash)
11.	Seed Production in Agricultural Crops and Fisheries. (MSP) (Dr.P.R.Vijayakumari (Nodal Officer), Dr. V. Santhy, Dr. K. Rathinavel, Dr. R. A. Meena)
12.	Studies on Genetic Purity of Public released Cotton Hybrids and its Parents with the help of SDS-PAGE. (Dr. P.R. Vijayakumari (PL), Dr. K.R. Kranthi)
13.	Characterization of public sector released genotypes of cotton (<i>Gossypium</i> spp) based on molecular markers to serve as Special test for Varietal Protection. (Dr.V. Santhy (PL))
14.	Exploration, collection and conservation of perennials and land races of <i>Desi</i> cotton from different regions of India. (Dr. M. Saravanan (PL))
15.	Development of long staple <i>G. hirsutum</i> variety with improved fibre strength. (Dr.S. Manickam (PL), Dr. V.N. Waghmare, Dr. S.L. Ahuja)
16.	Development of extra-long staple high spinning hybrids with wider adaptability. (Dr.KPM. Dhamayanthi (PL))
17.	National Seed Project (Crops). (NSP) (Dr.K. Rathinavel (PI))
18.	Testing & Documentation of Extant Varieties, hybrids and their Parents for Distinctness, Uniformity & Stability (PVP & FR ACT, 2001). (DUS) (Dr.K. Rathinavel (Nodal Officer))
19.	Development of early maturing, medium staple varieties and hybrids Resistant to CLCuV. (Dr. O.P. Tuteja (PL), Dr. D. Monga, Dr. Rishi Kumar, Dr. S.M. Palve)
20.	Identification of male sterile plants in genetic male sterility (GMS) using molecular markers. (Dr. O.P. Tuteja (PL), Dr. S.B. Singh, Dr. M. Saravanan)
21.	Development of <i>G. hirsutum</i> genotypes with high yield and high GOT. (Dr.S.L. Ahuja (PL), Dr. R. A. Meena, Dr. D. Monga, Dr. Rishi Kumar)
22.	Association mapping of fibre traits in <i>Gossypium arboreum</i> L. accessions using SSR, ISSR and AFLP markers (UGC) (Dr.S.K. Verma (PA))
23.	Studies to improve the seed setting efficiency in cotton. (Dr.RA Meena (PL), Dr. RishiKumar, Dr. K. Rathinavel)
24.	Allelopathy as an alternative weed management strategy in cotton. (Dr. Blaise Desouza (PI), Dr. P. Nalayini, Mrs. M. Chakrabarty)
25.	Georeferenced soil information system for land use planning and monitoring soil and land quality for agriculture. (NAIP) (Dr. M.V. Venugopalan (CCPI))
26.	Identification of 'crop-cycle' for Extra Long Staple (ELS) Cotton in non-conventional regions. (Dr. R.B. Singandhupe (PI), Dr. Blaise Desouza)
27.	Herbicide resistance weeds and their management strategies. (Dr.A. R. Raju (PI), Dr. K. Sankarnarayanan)
28.	A Value Chain for Cotton Fibre, Seed and Stalks: An innovation for higher economic returns to farmers and allied stakeholders. (NAIP) (Dr. K. Shankarnarayanan (Co-PI))
29.	Synthesis and characterisation of nano-formulated micronutrient foliar spray for yield maximisation in different cotton genotypes. (Dr.D.Kanjana (PL))
30.	An accelerated process for preparation of bioenriched compost from cotton plant residues. (IICP(CIRCOT)) (Mr. K. Velmourougane (PA))
31.	Physiological manipulation for extending cotton crop. (Dr.S.E.S.A Khader (PI), Dr. A.H Prakash)
32.	Phenotyping of cotton for drought tolerance traits. (Dr.J.H. Meshram (PI), Dr. R.B.Singandhupe, Mrs. M. Chakrabarty)
33.	Role of Leaf Phytochemicals in cotton leaf reddening and plant responses to management through growth chemicals, nutrients and insecticides. (Mrs. M.Chakrabarty (PI))

34.	Impact evaluation of Bt cotton in Maharashtra. (Dr. A. R. Reddy (PI), Dr. R. B. Singandhupe, Dr. S. N. Rokde)
35.	Design & Development of a cotton picking head. (DST) (Er. Gautam Majumdar (PI))
36.	Identification of species specific dsRNA or siRNA or miRNA in cotton insect pest to explore their use in pest management through RNAi based technologies. (DBT) (Dr. K.R.Kranthi (PL), Dr. S. Kranthi, Dr. K.P. Raghavendra)
37.	Novel approaches for production of hybrid seeds with characteristics of improved insect resistance and higher yield. (CSIR-NIMITLI-Phase II) (Dr. K. R. Kranthi (CCPI), Dr. S. Kranthi)
38.	Evaluation of built in refuge for insect resistance management requirements for Bollgard II cotton. (Contract) (Dr. S. Kranthi, Dr. B. Dharajothi, Dr. Rishi Kumar)
39.	Research into development of decision support systems for management of insect pests of major rice and cotton based cropping systems. (NAIP) (Dr.VS Nagrare (CCPI), Er.G Majumdar, Dr.Rishi Kumar, Dr.B Dharajothi, Mr. M. Sabesh, Dr.M. Amutha)
40.	Crop pest surveillance and advisory project (CROPSAP)in Maharashtra. (Maha. Govt.) (Dr. V. S. Nagrare (PI))
41.	Isolation and characterisation of endophytes in cotton and endosymbionts in boll worms. (Dr.M. Amutha (PI))
42.	Use of innovative methods for management of cotton leaf curls virus disease. (Dr.D. Monga (PL), Dr. Rishi Kumar (PA))
43.	Development of nanoparticles based bio-control formulation for the management of major cotton pests and diseases. (Mr. A. Sampath Kumar (PL), Mr. K. Velmourougane)
44.	Disease monitoring of Tobacco Streak Virus (TSV) on cotton for South zone consisting of Andhra Pradesh, Karnataka and Tamil Nadu. (Dr. M. Gunasekaran (PI))
45.	Cloning and characterization of potent toxin gene from heat tolerant isolate of <i>Heterorhabdus indica</i> , an Entomopathogenic nematode. (DBT) (Dr. N.G. Narkhedkar (PI) Dr. P.K. Chakrabarty)
46.	Production, stabilisation, formulation and validation of microbial agents and their natural products against insects and nematode pests of cotton. (Dr. Gulsar Banu (PL), Dr. M. Amutha)
47.	Molecular characterization and validation of fiber strength genes with fiber specific promoter for improvement in cotton. (NFBSFARA) (Dr. G. Balasubramani (PI), Dr. K. P. Raghvendra , Dr. J. Amudha, Dr. S.B. Nandeshwar)
48.	Genomics of cotton boll and fibre development. (NAIP) (Dr. G.Balasubramani (PI), Dr. K.P. Raghavendra , Dr. J. Amudha, Dr. S.B. Nandeshwar)
49.	Development of drought resistant transgenic cotton and identification of new genes for high water use efficiency. (Dr. J. Amudha (PI), Dr. AH.Prakash, Dr. G.Balasubramani, Dr. R.B. Singandhupe)
50.	Isolation and identification of seed specific promoter and gossypol synthesis genes for silencing through RNA interference. (DBT) (Dr. K.P. Raghavendra. KP (PI), Dr. J. Amudha)
51.	Development of multi-gene constructs and Bt cotton varieties for sustainable pest management. (TMC 1.1) (Dr. K.R.Kranthi (PI), Dr. P.K.Chakrabarty, Dr. K.P.Raghavendra, Dr. S.B.Nandeshwar, Dr. G.Balasubramani, Mr. K.Velmourougane, Dr. S.Kranthi, Dr. S.B.Singh, Mrs. M. Chakrabarty)
52.	Marker Assisted Breeding for Cotton Leaf Curl Disease (CICuD), Bacterial Leaf Blight (BLB) and Nematodes Resistance in Cotton. (TMC 1.2). (Dr. V.N. Waghmare (PI) , Dr. P. K. Chakrabarty, Mr. Sampath Kumar, Dr. N. Narkhedkar , Dr. S. Manickam, Dr. Dilip Monga, Dr. S. K. Verma)
53.	Consolidation of repository of high strength cotton genotypes and evaluation for quality traits and yield in specific agro-eco zones". (TMC 1.3) (Dr. S. Manickam (PL), Dr. T.R. Loknathan, Dr. S.M. Palve, Dr. P. Nalayini)

54.	Agrotechniques for high density planting system and surgical cotton varieties. (TMC 1.4) (Dr. Venugopalan (PI), Dr. Blaise DeSouza, Dr. C B.Naik, Dr. A R.Reddy, Dr. Punit Mohan, Dr. T.R. Lokanathan, Dr. A.R. Raju, Mr. Sampathkumar, Dr. K. Sankarnarayanan, Dr. S. L. Ahuja, Dr. R.A. Meena)
55.	Simulation models/Sensor based gadgets for Cotton Protection and Production. (TMC 1.5) (Dr. Sandhya Kranthi (PI), Dr. V. S. Nagrare, Dr. K.R. Kranthi, Dr. C.B. Naik, Dr. A.R. Reddy, Dr. N. Anuradha, Mrs. M.Chakrabarty, Dr. A. H. Prakash, Dr. M. Amutha, Dr. K. Sankarnarayanan, Dr. Isabella Agarwal, Dr. B. Dharajothi, Dr. Rishi Kumar)
56.	E-Kapas Network and Technology Documentation. (TMC 1.6) (Dr.S.M. Wasnik (PI), Mrs. M. Chakrabarty, Dr. S. Usha Rani, Dr. O. P.Tuteja)
57.	Development of Cotton Picking Machinery for Small Scale Cotton Production Systems. (TMC 1.7) (Er. Gautam Majumdar (PI))

10.3 : Consultancy, Patents, Commercialization of Technology

Revenue Generation

The Bt Referral lab generated a revenue of Rs.7,00,260/- through sale of Bt express, Bt Quant, GUS detection kits in 2013-14.

Patented Technology Published in IPINDIA website

Three patents submitted by Dr. P. K. Chakrabarty, Er. G. Majumdar and Dr. Nandini Gokte Narkhedkar were published, anticipated for the first examination report from Patent office, Mumbai.

Two bio-pesticides to control Mealy bug called "Mealy Quit" and "Mealy Kill" are ready for commercialization.

MoU between CICR and M/s. Padgilwar, Nagpur

Memorandum of Understanding (MoU) was signed between CICR and M/s. Padgilwar, Nagpur for Solar Powered Knapsack Sprayer on 17th Dec 2013 in which the term and conditions including license fee and 5% royalty on each unit sold were fixed.

10.4 : Significant Decisions of RAC, IRC, IMC and Other Important Meetings

Research Advisory Committee Meeting

Research Advisory Committee (RAC) meeting was held at Central Institute for Cotton Research (CICR), Nagpur from 14th to 15th March 2014. The RAC meeting was chaired by Dr. B.V. Patil, Vice Chancellor, UAS, Raichur, Karnataka. The following RAC members attended the meeting.

- Dr. T. Pradeep, Principal Scientist (Breeding), Maize Research Centre, ARI, ANGRAU
- Dr. A. K. Dhawan, Ex. Prof. & Head, Entomology, PAU, Ludhiana
- Dr. A. J. Shaikh, Ex-Director, Central Institute for Research on Cotton Technology

Dr. K. R. Kranthi, Director, CICR welcomed the RAC Chairman and the members, Heads of the Divisions and Regional Stations, Coimbatore and Sirsa. The proceedings started with the opening remarks by the Chairman, RAC. In his opening remarks, the Chairman, RAC, welcomed the members of RAC for the meeting and appreciated the suggestions made in QRT report. He emphasized the problem of lower yield levels in India and suggested that all the scientific efforts should be consolidated to achieve higher cotton productivity. He also congratulated the institute for bagging Mahindra Samridhi Krishi Sansthan Award for outstanding performance in cotton research. The action taken report for each of the institute, TMC and external funded projects was presented by Dr. M.V. Venugopalan, Member Secretary, RAC.



Recommendations of RAC

General recommendations (GR)

1. Identification of early maturing varieties for different situations under HDPS with incorporation of *Bt* gene, if possible and development of picker should be the overall objective

2. Plant type and mechanization of harvesting should be given priority
3. Time framing of the project objectives for effective monitoring and evaluation
4. Foreign training of young scientists should be arranged in the best laboratories especially in frontier areas of gene discovery aspects for crop protection

Crop Improvement Division:

1. DNA fingerprinting of all the public sector cotton varieties should be done on priority.
2. Reducing the number of projects to improve the focus of the research in crop improvement.
3. Strategies for improving seed vigour should be given emphasis. Changes in the biochemical profile within the seed during germination may be investigated.
4. Seed packaging material needs to be standardized for long term storage.
5. Breeding programme towards development of surgical cotton should be given impetus for meeting the future industrial requirement.
6. Registration of plant varieties should be taken up at the earliest.

Crop Production Division:

1. Trials to develop a comprehensive weed management strategy for HDPS are needed
2. Demonstration of one large scale precision cotton farming in all the zones with the latest HDPS concept
3. Variety 'F1054' along with other genotypes may be tested under HDPS in North India
4. Location specific agro-technology for HDPS in cotton to be worked out. The possibility of double cropping after HDPS cotton may be explored wherever earliness is obtained by this technology
5. Problems if any, pointed out by the farmers with HDPS system should be redressed. Seed production of varieties suitable for HDPS need to be given emphasis to enable wide spread adoption of technology by the farmers
6. Any herbicide (like paraquat) alone or in combination at low doses can be explored as an alternative to costly defoliant available in the market after ruling out its undesirable effects on fibre quality
7. Application of combination of herbicides should be done cautiously and checked for phyto-toxicity to popular cotton varieties

8. Bulletin on weed flora of cotton system may be published
9. Changes in soil health parameters should be monitored periodically from GPS fixed locations in CICR farm under continuous cultivation of Bt hybrids. Soil health card for these sites should be maintained.
10. Evolutionary significance of seed gossypol in relation to plant growth, stress abatement and crop development may be explored.
11. Cost benefit ratio of use of Pusa Hydrogel technology should be worked out for cotton
12. Ajwain as a cover crop may be explored.

Crop Protection Division:

1. Efforts can be taken to develop repository of the AICCIP entries known to be tolerant to different sucking pests and diseases at CICR
2. Collection and conservation of biodiversity of all the insect pests and natural enemies.
3. Management of jassids and whiteflies in cotton to be addressed on priority.
4. Role of pollinators in cotton ecosystem and the effect of different insecticides on pollinators needs to be studied.
5. Intensification of the work on gene silencing.
6. To investigate if north populations of pink bollworm undergo diapause when brought to central India and if so, the percentage of diapausing pupae.

Biotechnology Section:

1. Consolidate the efforts within a time frame towards development of Bt cotton varieties.

CICR, RS, Coimbatore:

1. Study of possible variation in Bt toxin levels in relation to elevated levels of CO₂, pruning and leaf reddening.

CICR, RS, Sirsa:

1. Studies on the whitefly populations carried over.
2. Reconfirm the efficacy of neem based insecticides on the management of whiteflies.

QRT meeting for finalization of recommendations

A wrap-up meeting of QRT for finalization of recommendations was held on 12.07.2013 at CICR, Nagpur under the chairmanship of Dr. C.D. Mayee. The following members attended the meeting:

Dr. D. P. Biradar, Member, QRT

Dr. (Mrs.) Usha Barwale, Member, QRT

Dr. K.R. Kranthi, Member, QRT

Dr. M.V. Venugopalan, Member Secretary, QRT

The recommendations prepared by the members were finalized during the meeting. The final report of QRT for CICR & AICCIP (2007-12) was prepared and submitted to the Council for further needful. Later, the Chairman, QRT presented the recommendations before the

Director General, ICAR.

Institute Management Committee Meeting

The 51st Institute Management Committee (IMC) meeting was held on 21st August 2013 under the Chairmanship of Dr. K.R. Kranthi, Director, CICR, Nagpur. The meeting was attended by the following members.

1.	Dr. K. R. Kranthi , Director	CICR, Nagpur	Chairman
2.	Dr. R.G. Dani, Vice Chancellor	Dr. PDKV, Akola	Member
3.	Joint Director of Agriculture*	Govt. of Maharashtra, Nagpur	Member
4.	Shri. Sharad Tasare, Ex M.L.A.	Maharashtra Assembly, Amravati	Member
5.	Dr. Dilip Monga, Head	CICR Regional Station, Sirsa	Member
6.	Dr. P.K.Chakrabarty, Head	Division of Crop Improvement, CICR, Nagpur	Member
7.	Shri G. C. Prasad, Sr. F & AO	NBSS & LUP, Nagpur	Member
8.	Shri Sachin Agnihotri, Sr. Admn. Officer	CICR Nagpur	Member Secretary
9.	Dr. C.D. Mayee, Ex-Chairman ASRB, New Delhi	Chairman QRT for CICR & AICCIP	Spl. Invitee
10.	Dr. (Mrs.) Sandhya Kranthi, Head	Division of Crop Protection, CICR Nagpur	Spl. Invitee
11.	Dr. Blaise Desouza, Head	Division of Crop Production, CICR Nagpur	Spl. Invitee
12.	Dr. S.B. Nandeshwar, Pr. Scientist	Biotechnology Section, CICR Nagpur	Spl. Invitee
13.	Shri. Deepak Maheshwari, F. & A.O.	CICR Nagpur	Spl. Invitee
14.	Dr. M.V. Venugopalan, Pr. Scientist & Head	PME Cell, CICR Nagpur	Spl. Invitee

*Represented by Shri R. B. Chalwade, Superintendent Agriculture Officer, Nagpur Division

Dr. K.R. Kranthi, Director CICR & Chairman, IMC mentioned that this session of IMC was specially convened to facilitate an interactive meeting of the Chairman, QRT with the IMC for the presentation of the recommendations of QRT. The other major agenda was seeking approval of the committee for purchase of equipments, furniture & fixtures and execution of works proposed in XII Plan to be taken on priority as per ICAR guidelines and for proposing the same under R.E. of 2013-14. This is necessary as the XII Plan is yet to be approved by the Council. Elaborating on further, the Chairman informed that a recent accidental fire gutted the Bt. referral lab and the lab needs to be renovated. Losses caused due to the fire are being examined by the CPWD to write off the material damaged and the final report is awaited. Additionally, the training hall inaugurated on 12th Nov. 2012 needs to be furnished and fitted with audio-visual aids/fixtures to make it functional. Essential equipments are needed to carry forward the newly launched E-kapas programme (under TMC) which intends to connect farmers through voice mail.

The IMC unanimously recommended for approval from Council for purchase of proposed instruments, furniture/fixtures and also for renovation works.



Dr. R. G. Dani, Vice Chancellor, PDKV informed that with 93 % of the area under Bt hybrids, there are few takers for varieties like AKH 081 and AKA 7 even though these have a good potential under HDPS. Dr. Dani mentioned about the MoU signed with CICR and hoped that this would enhance the quality of PG research at Dr. PDKV and the collaborative programmes on biotechnology will be strengthened.

Shri. Sharad Tasare, Ex-MLA, Amravati appreciated the new initiatives in cotton by CICR but appealed the

research community to work hard to restore the confidence of farmers in the cotton production system so that they will get returns from the crop in commensuration with the investment made.

Shri. G.C. Prasad, SFAO, NBSS&LUP, Nagpur expressed satisfaction over the expenditure pattern and the resources generated of the institute. He added that the equipments / works / furniture / fixtures proposed are essential and need to be attended on priority.

Shri. R.B. Chalwade, Superintendent Agriculture Officer, Nagpur who represented the Joint Director of Agriculture, Nagpur endorsed that the farmers of the region are showing keen interest on two technologies - HDPS in cotton and broad bed- furrow system. He also informed that the cotton area in Nagpur division in 2013-14 was 419800 ha.

Institute Research Committee (IRC) meeting

The Annual Institute Research committee (IRC) meeting of CICR was conducted as a combined IRC for all the centres from 20-22nd March 2014 at CICR, Nagpur. Dr M.V. Venugopalan, Member secretary, RAC presented the specific recommendations of Research Advisory Committee meeting held on 14th March 2014.

Dr M.V. Venugopalan also presented the Quinquennial Review Team (QRT) recommendations. Mrs. Mukta Chakrabarty presented Research Framework Document (RFD) of the Institute. Mr. K. Velmourougane, Secretary IRC, presented the Action Taken Report of the previous IRC (2013). The IRC confirmed the minutes of the last IRC meeting.

The results of research projects at CICR, Nagpur, RS, Coimbatore and RS, Sirsa were presented by individual project leaders, discussed and critically reviewed as per

the technical programme. The technical programmes for the year 2014-15 were also finalized for each project. The meeting was chaired by Dr. K. R. Kranthi, Director, CICR and scientists of Nagpur, Coimbatore and Sirsa participated in the deliberations.

The IRC recommended the closure of 5 projects, approved 8 new projects to be initiated during 2014-15.

Project Monitoring and Evaluation Committee (PMC)

The Project Monitoring and Evaluation Committee of the Central Institute for Cotton Research (CICR) was re-constituted as per the ICAR guidelines to review and evaluate the progress of ongoing research projects of the institute consisted of the following members from CICR, Nagpur.

1.	Chairman	Dr. K. R. Kranthi, Director
2.	Member	Dr. P.K. Chakrabarty, Head, Division of Crop Improvement
		Dr. Sandhya Kranthi, Head, Division of Crop Protection
		Dr. Blaise Desouza, Head, Division of Crop Production
3.	Member Secretary	Dr. M. V. Venugopalan, I/c, PME Cell

The committee evaluated the implementation of projects twice during the year (15-16 June, 2013 & 12-13 Nov., 2013) at Nagpur. At Coimbatore, the evaluation was done on 12-13 Dec., 2013

The Chairman and the members visited experimental fields and verified the implementation of the IRC approved technical programme. Modification of the approved technical program was suggested to derive additional information.

10.5 : Results – Framework Document (RFD) Committee

ARFD Committee was re-constituted as per the guidelines of the ICAR with the following officials of this institute.

Name	Designation
Dr. K.R. Kranthi	Director
Dr. M.V.Venugopalan	Nodal Officer (Principal Scientist and I/c, PME Cell)
Shri. Sachin Agnihotri	Sr. Administrative Officer
Shri. Deepak Maheshwari	Finance & Accounts Officer
Dr. (Mrs.) S.B. Singh	Co-opted Member
Dr. P.K. Mukherjee	Co-opted Member (Deputation completed & relieved on 01.05.2013)
Mr. A.Sampath Kumar	Co-opted Member
Dr. (Mrs.) Mukta Chakrabarty	Co-Nodal Officer & Co-opted Member

The committee meets periodically to discuss the success indicators of the monthly RFD report before sending to ICAR. This committee also finalizes the mid-term and annual RFD performance achievement

reports.

RFD Cell has been constituted as per the guidelines of the ICAR with the following officials to manage the activities of the RFD.

S.No	Category	Name & Designation
1	RFD Nodal Officer	Dr. M. V. Venugopalan, Principal Scientist (Agronomy) and I/c, PME Cell
2	One Scientist	Dr. K. P. Raghavendra, Scientist (Biotechnology)
3	One Technical Officer	Dr. M. S. Yadav, Chief Technical Officer & Nodal Officer, PME Cell
4	One Administrative Staff	Mr. Ghanshyam D. Sakhare, Lower Division Clerk & Typist

The Institute set a high performance standard and achieved a total composite score of 91% (Ranked in Very Good category) in the Annual Performance

Evaluation Report (April 1, 2012 to March 31, 2013). The details are given in **Annexure-I**.

10.6 : Participation of Scientists in Seminars/Symposia/Workshops /Meetings

Sr. No.	Seminars/Conferences/Symposia/ Workshops/ Meetings	Place and Date	Participants
Seminars			
1.	National Convention on Indian Cotton: Gearing up for Global leadership	MCRS, Surat 6-8 Jan., 2013	Dr. Suman Bala Singh, Dr. M. Saravanan, Dr. T. R. Loknathan, Dr. Punit Mohan
2.	AICCIP Workshop	MPUAT, Udaipur 8 - 10 April, 2013	Dr. A. H. Prakash, Dr. S. Manickam, Dr. K. Rathinavel, Dr. B. Dharajothi, Dr. K.P.M. Damayanthi, Dr. J. Gulsar Banu, Dr. S. Usha Rani, Dr. T. R. Loknathan, Dr. S. M. Palve, Dr. Punit Mohan, Dr. V. N. Waghmare, Dr. M.V. Venugopalan, Dr. D. Monga, Dr. S. L. Ahuja, Dr. O.P. Tuteja, Dr. R. A. Meena, Dr. Rishi Kumar
3.	Brain Storming Session on Research in Agrl. Extension	CIFE Mumbai 26 April, 2013	Dr. Blaise Desouza, Dr.M.V. Venugopalan, Dr. A.R. Raju, Dr. R.B. Singandhupe, Dr. S.M. Wasnik, Dr. S.N. Rokde, Mrs. Mukta Chakrabarty, Er. Gautam Majumdar, Dr. J.H. Meshram
4.	National Seminar on 'Soil Feasibility, Degradation and Contaminants'	BSKVV, Dapoli 8-9 May, 2013	Dr. Jagvir Singh, Dr. S.M. Wasnik
5.	41 st Joint Agriculture Research and Development meeting (AGRESO)	MAU Parbhani 30 May to 1 June 2013	Dr. S.M. Wasnik
6.	XIII National Seed Seminar	UAS, Bangalore 8-10, June, 2013	Dr. V. Santhy, Dr. P. R. Vijaya Kumari Dr. P.K. Chakrabarty

7.	Steering committee meetings for implementation of Technical Assistance Program (TAP) to seven African countries under Africa India Forum Sumit	New Delhi 3 July, 2013	Dr. D. Monga
8.	3 rd International congress of Global warming on Biodiversity of Insects: Management and conservation	B U, Coimbatore 26-28 August, 2013	Dr. J. Gulsarbanu Dr. M. Amutha
9.	6 th National Seed Congress organized by NSRTC Varanasi	Varanasi 12-14 Sept., 2013	Dr. K. Rathinavel
10.	Seminar on Possibilities of improving fibre quality through agronomic interventions	GTC, Nagpur 18 Sept., 2013	Dr. Blaise Desouza
12.	National Seminar on Technology for Development of Rainfed Cotton	Bharuch, 24 – 25 Oct., 2013	Dr. M. Saravanan, Dr. Vinita Gotmare, Dr. Punit Mohan, Dr. H.B. Santosh, Dr. M.V. Venugopalan, Dr. Sandhya Kranthi, Dr. A.H. Prakash, Dr. S. Manickam
13.	Zonal Extension and Research Advisory meeting (ZERAC) of Central Vidharbha Zone for Rabi 2013	Yeotmal, 28 Oct., 2013	Dr. S.M. Wasnik
14.	Seminar on 'Knowing the Biological Biodiversity Act'	TNAU, Coimbatore 26 Nov., 2013	Dr. K.P.M. Damayanthi
15.	Biopesticide International Conference	Palayamkottai 28-30 Nov., 2013	Dr. J. Gulsar Banu Dr. M. Amutha
16.	Water use and water use efficiency- Phenotyping and their relevance in improving adaptation of crops under water limited condition.	UAS, GKVK, Bengaluru 2-4 Dec., 2013	Dr. J.H. Meshram
17.	Third International Conference 'Extension Education Strategies for Sustainable Agriculture Development - A Global Perspective'	UAS, Bengaluru 5-8 Dec., 2013	Dr. S.M. Wasnik, Dr. S. Usha Rani
18.	Steering committee meeting of CROPSAP	Pune 6 Dec., 2013	Dr. V.S. Nagrare
19.	SIMA Farm to Finish Expo 2013 Workshop on Harnessing Cotton Cultivation <i>Capabilities in India</i>	Coimbatore, 13-15 th December, 2013	Dr A. H. Prakash
20.	Steering committee meetings for implementation of Technical Assistance Program (TAP) to seven African countries under Africa India Forum Sumit	New Delhi 23 Dec., 2013	Dr. O. P. Tuteja
21.	National Seminar on "Corporate Social Responsibility in Community Development"	ADU, Coimbatore 22-23 Jan. 2014	Dr. S. Usha Rani
22.	International Conference on Biodiversity, Bioresources and Biotechnology	Mysore 30-31 Jan., 2014	Dr. J. Gulsarbanu
23.	Institute Management Committee meeting of NCIPM	New Delhi 7 Feb., 2014.	Dr. Sandhya Kranthi
24.	Institute Management Committee meeting of NRC Citrus	Nagpur	Dr. Sandhya Kranthi
25.	Institute Management Committee meeting of NBSSLUP	Nagpur 27 Nov., 2013	Dr. M.V. Venugopalan

26.	AZRA Silver Jubilee International Conference on Security and Environmental Safety	CRRI, Cuttack 16 - 18 Feb., 2014	Dr. B. Dharajothi, Dr. J. Gulsarbanu
27.	8 th Review Meeting of DUS test centres	UAS, Bengaluru 28.Feb. to 01 Mar., 2014	Dr. K. Rathinavel
28.	Institute Technology Management Unit (ITMU) meeting	CICR, Nagpur 7 March,2014	Dr. Blaise Desouza, Dr. Sandhya Kranthi, Dr. M.V. Venugopalan, Dr. A.R. Raju, Dr. R.B. Singandhupe, Dr. J. Annie Sheeba, Dr. S.M. Wasnik, Dr. S.N. Rokde, Mrs. Mukta Chakrabarty, Mr. Gautam Majumdar, Dr. J.H. Meshram
29.	A brainstorming session on 'Where are the constraints for high cotton yields?' Organized by Indian Society for Cotton Improvement (ISCI).	CICR, Nagpur 15 th March 2014	Director, HODs, all Scientists from HQ, Dr. D. Monga, Dr. A.H. Prakash,



10.7 : Distinguished Visitors

Name & Designation	Organisation	Date
Nagpur		
Dr. M.S. Swaminathan, Emeritus Chairman	MSSRF, Chennai	11.07.2013
Dr. T.P. Rajendran, OSD	NIBSM, Raipur	19.08.2013
Dr. Atanu Purkayastha, Joint Secretary (Seeds/TMOP/TMC)	DAC, MoA, GOI, New Delhi	06.09.2013
Dr. Anupam Barik, Additional Commissioner, Crop	DAC, MoA, GOI, New Delhi	06.09.2013
Shri Ashish Bahuguna, Agriculture Secretary	DAC, MoA, GOI, New Delhi	06.09.2013 29.01.2014
Dr. Sudhir Kumar Goel, Additional Chief Secretary, (Agriculture)	Agriculture Department, Govt. of Maharashtra, Mumbai	06.09.2013
Shri Sanjeev Gupta, Joint Secretary, Extension,	DAC, MoA, GOI, New Delhi	06.09.2013
Shri Umakant Dangat, Agriculture Commissioner,	Agriculture Department, Govt. of Maharashtra, Pune	06.09.2013
Shri B. Venugopal Reddy, District Collector	Nagpur, Maharashtra	07.09.2013
Dr. Dath K. Mita, Crop Analyst	International Production Assessment Division, Global Analysis USDA, USA	18.09.2013
Dr. Santosh Kumar Singh, Senior Agrl. Specialist	American Embassy New Delhi	18.09.2013
Dr. J. Sandhu, Agricultural Commissioner	DAC, MoA, GOI, New Delhi	26.09.2013
Dr. N. P. Singh, Director	ICAR, Research Complex, Goa	10.10.2013
Sh. B. K. Mishra, Chairman cum Managing Director,	Cotton Corporation of India (CCI), Mumbai	19.11.2013
Sh. M. M. Chockalingam, Director, Marketing	Cotton Corporation of India (CCI), Mumbai	19.11.2013
Sh. P. K. Agarwal, Director, Finance	Cotton Corporation of India (CCI), Mumbai	19.11.2013
Sh. Prithviraj Chavan, Hon'ble Chief Minister	Govt. of Maharashtra, Mumbai	16.01.2014
Shri RadhaKrishna Vikhe Patil, Agricultural Minister	Govt. of Maharashtra, Mumbai	16.01.2014
Sh. J. S. Saharia, Chief Secretary	Govt. of Maharashtra, Mumbai	22.01.2014
Dr. Sudhir Kumar Goel, Additional Chief Secretary, (Agriculture)	Agriculture Department, Govt. of Maharashtra, Mumbai	23.01.2014
Sh. B. Venugopal Reddy, Divisional Commissioner	Nagpur Division, Maharashtra	23.01.2014
Shri Ajit Powar, Deputy Chief Minister	Govt. of Maharashtra, Mumbai	25.01.2014
Sh. Shivajirao Moghe, Guardian Minister	Govt. of Maharashtra, Mumbai	02.02.2014
Coimbatore		
Dr. N. Gopalakrishnan, ADG (CC)	ICAR Head quarters, New Delhi	05.07.2013, 07.09.2013, 29.09.2013, 13.01.2014
Dr. S.K. Dutta, DDG (Crop Science)	ICAR Head quarters, New Delhi	30.07.2013
Dr. R. R. Hanchinal, Chairman,	Protection of Plant Varieties & Farmers Right Authority, New Delhi	28.11.2013