

List of approved on-going projects

Institute Projects

Nagpur

Crop Improvement

1. Collection, conservation, evaluation, documentation and utilization of genetic resources of cultivation species of *Gossypium*.
2. Genetical and anatomical studies on drought tolerance in cotton *G.hirsutum*.
3. Conservation of wild species of *Gossypium* and introgressive hybridization for the improvement of cultivated species cotton.
4. Breeding for high yielding and long staple genotypes of *arboreum* cotton with high fibre strength .
5. Breeding cotton genotypes suitable for cultivation in shallow soils
6. Studies of genetic enhancement of upland cotton.
7. Studies on genetic base of upland cotton varieties.
8. Improvement of seed yield and quality in *G.arboreum* culture with low input management under different soil depths.
9. Seed yield and quality improvement in *arboretum* cultures with low input management under different soil depth.
10. Assessment of seed vigour traits in cotton.
11. Evaluation of cotton germplasm through molecular techniques.
12. Development of tissue culture protocol for use in breeding and genetic transformation.
13. Molecular mapping of leaf curl virus resistance gene in cotton genome.

Crop Production

14. Studies on the efficacy of micro-nutrients application and moisture management in improving yield and fibre quality.
15. Improving the efficiency of cotton+ pigeon pea strip cropping in vertisols.
16. Studies on long term effect of nutrient management practices on the productivity, nutrient balance and sustainability of cotton based cropping systems.
17. Tillage and crop residue effects on soil, nutrient and cotton crop behaviour.
18. Studies on water use efficiency of harvested rainwater, through drip irrigation in cotton.
19. Evaluation of suitable moisture management practices for rainfed cotton in shallow soil.

Crop Protection

20. Biochemical basis of induction of defense related proteins in cotton against *Helicoverpa armigera*.
21. Interaction effects of cultivars, agrotechniques, insect pests and entomophages in cotton ecosystem.
22. Estimation of losses due to major pests of cotton.
23. Studies on multiple disease resistance in upland cotton.

Biotechnology

11. Evaluation of cotton germplasm through molecular techniques.
23. Studies on multiple disease resistance in upland cotton.





24. Studies on seed transmitted pathogenic infections and other seed microflora of cotton.
25. Studies on evolution of races of *Xanthomonas axonopodis* pv. *malvacearum* (Xam) and utilization of HVS in identification of resistant sources.
26. Evaluation of cotton germplasm against *Alternaria* and *Myrothecium* leaf spot diseases.
27. Efficacy of antagonist fungal microflora from rhizosphere of cotton, its growth and development including disease control.
28. Studies on plant parasitic nematodes associated with cotton.
29. Molecular basis of pathogenicity and race specificity of *Xanthomonas axonopodis* pv. *malvacearum* (Xam) and characterization of its antagonists.
37. Impact of cotton front-line demonstrations on technological advancement of cotton growers.
38. Economic analysis of cotton cultivation in India.

Regional Station, Coimbatore

30. Physiological evaluation of cotton germplasm under rainfed conditions.
31. Physiological and biochemical studies on abiotic stress with particular reference to heat and drought in cotton.
32. Physiological and biochemical basis of salinity tolerance in cotton.
33. Physiological and Biochemical basis of waterlogging tolerance in cotton.
34. Source-sink alteration with reference to flower induction as a tool to improve physiological efficiency and productivity in cotton.
39. Development of high yielding intra *hirsutum* hybrids.
40. Breeding *G.hirsutum* cotton varieties with new plant types - Development of medium staple varieties.
41. Development of extra long staple high spinning hybrids of interspecific origin with wider adaptability.
42. Development of high yielding and high spinning extra long staple cotton.
43. Maintenance and evaluation of cotton germplasm.
44. Inter-specific and inter-racial hybridization and gene transfer in *Gossypium*.
45. Development and utilization of cytoplasmic and genetic male sterility for hybrid cotton seed production and fertility restoration in cotton.
46. Studies on viability, vigour and longevity of cotton seeds.
47. Studies on the long term effect of nutrient management practices on the productivity, nutrient balance, soil physico-chemical properties and sustainability of cotton based cropping system.
48. Studies on the long term effect of continuous application of nutrients in fixed cotton based crop rotation on the productivity, nutrient balance and sustainability of the cropping system.

Extension & Economics

35. A study on structure of agriculture and social dynamics of cotton production.
36. A study on technology adoption behaviour of cotton growers : Structural perspective.
49. Exploring suitable agro-techniques for Bt cotton hybrid.
50. Influence and secondary and micro-nutrients on qualitative and quantitative parameters of cotton.



51. Studies on population dynamics of cotton pests and their enemies in the cotton ecosystem.
 52. Studies on the host plant relationship and identification of resistant / tolerant varieties to insect pests of cotton.
 53. Studies on the role and effect of insecticides in cotton ecosystem.
 54. Studies on bioecology and management of cotton stem weevil *Pemphe- rulus affinis* Faust.
 55. Studies on the epidemiology and management of fungal foliar diseases of cotton.
 56. Studies on soil borne diseases of cotton.
 57. Studies on bacterial blight of cotton.
 58. Physiology of fibre growth and development.
 59. Identification and utilization of adaptive responses to abiotic stress in cultivated species of cotton.
 60. Studies on the response of elevated carbon di-oxide on physiology and productivity.
 61. Studies on biochemical mechanisms of resistance to bollworm of cotton.
 62. Studies on development biochemistry of cotton pest/ disease interaction.
 63. Source sink alteration with reference to flower induction as a tool to improve physiological efficiency and productivity in cotton.
 64. Present status, constraints and future strategies of cotton seed production in Tamil Nadu.
 65. Impact assessment of IPM/IRM technology adaption by cotton farmers.
 66. Farm level economic benefits of Bt cotton in Tamil Nadu.
 67. Expert system on cotton pest/insect.
- ### Regional Station, Sirsa
68. Evaluation of parents in *Gossypium hirsutum* for heterotic potential and useful heterosis for replacement of existing cultivars under north Indian conditions.
 69. Development of varieties and hybrids (MS based) of medium staple length in *Gossypium arboreum* L.
 70. Development of male sterility based hybrids of *G.hirsutum* for north India.
 71. Development of *G.hirsutum* cultivars with high fibre strength suitable for high speed spinning.
 72. Studies on seed technological aspects of hybrids and varietal seed production in north zone.
 73. Collection, conservation, evaluation and maintenance of genetic resources
 74. Evaluation and refinement of IPM module for irrigated cotton in north zone.
 75. Studies on cotton leaf curl virus disease and development of resistant varieties and hybrids for its management.
- ### Externally Funded Projects
1. **CFC/ICAR** : Sustainable control of the cotton bollworm *Helicoverpa armigera* in small scale production systems.
- ### DBT Projects
1. Genetic improvement of strains of entomopathogenic nematodes for tolerance to environment and enhanced efficacy against *Helicoverpa armigera*, cotton bollworm.
 2. Studies on toxicity of Bt (Cry) toxins to cotton pests, assessment of impact of Bt transgenic cotton plant on the ecosystem and development of resistance to Bt toxins in cotton bollworm *Helicoverpa armigera*.



AP Cess Fund

1. Use of entomopathogenic nematodes for biological control of *Helicoverpa armigera* of cotton.
2. Studies on the effect of insecticides on cotton plants and their interactions with American bollworm *Helicoverpa armigera* (Hubner) and its parasitoid *Campoletis chloridae* Uchida.
3. Identification and quantification of constraints, risks and policy impacts in cotton cultivation.

Aventis Funded

1. Studies on resistance breaking properties of Triazophos in combination with deltamethrin on pyrethroid resistant *Helicoverpa armigera*.

Indofil funded

1. Biochemical and ecological factors influencing the toxicity of Novaluron on the cotton bollworm *Helicoverpa armigera*.

Mahyco Funded

1. Monitoring for shifts in baseline susceptibility (development of tolerance / resistance) in the cotton bollworms toxin in various cotton growing regions of the country.

National Agricultural Technology Project (NATP)

Mission Mode

- CP-MM 1 : Development of Hybrid Crop-Cotton
- MM3 : Sustainable management of plant biodiversity-cotton.
- MM4 : Development of Bt. Transgenic for insect resistance - Cotton.

MMIII 17 : Development of weather based forewarning systems for crop pests and diseases cotton.

MMITK : Use of botanicals for pest and disease management in cotton, pigeon pea and sorghum.

II. Irrigated Agro-Ecosystem

PSR 4 : Studies on efficacy of bioinoculants in cotton-wheat based production system

PSR 26 : Control of leaf curl viral disease in cotton and development of protocol for mass multiplication of predators, parasites and insect pathogens

PSR 36 : Adoption and refinement of cotton picker and cleaning system.

IVLP : Technology assessment and refinement (TAR) of irrigated Agro Ecosystem for Coimbatore Region TN

III. Rainfed Cotton Production System (RCPS)

RCPS-2 : Optimising nutrient supply in relation to moisture availability for enhanced productivity and stability of rainfed cotton based production system

RCPS-3 : Assessment of Gossypol content in cotton Germplasm

RCPS-4 : Delineating the efficient productive zones for Cotton production system using GIS based crop models

RCPS-5 : Rainwater conservation, harvesting and recycling/recharging techniques for enhanced productivity of cotton based cropping system.

RCPS-7 : Promotion of productive high quality *G. arboreum* cotton to



meet the needs of marginal cultivators of rainfed ecosystem vis-à-vis textile industry.

RCPS-8 : Characterisation and identification of productive and high quality cotton species/genotypes including *G. herbaceum* for different rainfed agro-ecological situations adopting suitable approaches through farmers participatory programmes.

RCPS-9 : Develop and evaluate production technologies for the indigenous cotton of NE Region

RCPS-10: Development of Bt. transgenic diploid cotton against bollworm.

RCPS-11: Impact of tillage, land treatment and organic residue management on soil health, drainage

and crop, productivity of rainfed cotton based system.

IVLP- : Technology assessment and
TAR 15 : refinement of rainfed cotton based production system in Nagpur district through institute village linkage programme under rainfed Agro Ecosystem.

IV. Agro Ecosystem (Coastal)

PSR 16 : Exploitation of *G. herbaceum* cotton for improving agricultural output and economy of the coastal agro ecosystem.

V. Competitive Grant Programme

CGP-I : Induction of para nodules in cotton with N₂ (nitrogen) fixing bacterium *Azorhizobium caulinodans*.





Technology Mission on Cotton (TMC)

Proj. Code	Project Name	Centre
MM 1.1	Development of diploid cotton cultivars with high fibre quality	Nagpur, Sirsa
MM 1.2	Development of tetraploid cotton cultivars with high fibre quality and resistance to drought and biotic stresses	Nagpur, Coimbatore Sirsa
MM 1.3	Genetic improvement through introgression of useful genes in cultivated species of cotton	Nagpur, Coimbatore Sirsa
MM 1.4	Improvement of cotton seed oil	Nagpur Coimbatore Sirsa
MM 1.5	Maintenance breeding, seed production and marker based purity evaluation	Nagpur, Coimbatore Sirsa
MM 2.1	Integrated nutrient management for high quality fibre and yield	Nagpur
MM 2.2	Integrated water management system for quality fibre production	Nagpur Coimbatore
MM 2.3	Bioinoculants for sustainable and cost effective production of high quality fibre	Coimbatore
MM 2.4	Refining regional-level prediction of yield	Nagpur Coimbatore
MM 2.5	Ergonomically efficient implements for cotton production	Nagpur
MM 3.1	Integrated pest management (IPM) at village level for cost effective quality production	Nagpur, Coimbatore Sirsa
MM 3.2	Development of diagnostic tools for biotypes/races	Nagpur, Coimbatore Sirsa
MM 3.3	Commercialisation of bioagent mass-production technologies in intensive cotton districts	Nagpur
MM 5.1	Evaluation of cotton production technologies for yield, fibre quality and economic viability	Nagpur Coimbatore Sirsa
MM 5.2	Information, cotton website and documentation	Nagpur Coimbatore
MM 5.3	Coordination and Monitoring cell	Nagpur

