

CICR TECHNICAL BULLETIN

**TRAINING, CONSULTANCY, CONTRACT
RESEARCH AND CONTRACT SERVICE
IN COTTON PRODUCTION**

An information Brochure



**Central Institute for Cotton Research
Nagpur**

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1. INTRODUCTION

Realising the need for revamping the Agricultural Research System in the wake of the liberalization and globalization of markets, the Indian Council of Agricultural Research (ICAR) constituted a committee for developing a system of partnership, resource generation, training, consultancy, contract research, contract service and incentives and rewards so that the techniques, technologies and knowledge are generated and / or transferred and in the process entrepreneurship developed, visibility assured, goodwill generated and much needed incentive and reward system created.

Central Institute for Cotton Research (CICR) has got reasonable infrastructure and expertise of international repute for imparting training, consultancy, contract research and contract service. To implement these various modes of resource generation a 'Consultancy Processing Cell' was constituted under the chairmanship of Dr. Sheo Raj with Shri R. Kothandaraman, Dr. S. B. Nandeshwar, Dr. M. V. Venugopalan, Dr. K. B. Hebber, Shri Gulbir Singh and Shri Prahlad Singh as members. The committee has prepared this document in consultation with the 'Rules and Guidelines' circulated by ICAR and from the outcome of the discussion with Head of Divisions and sections of CICR.

CICR

The CICR was established in 1976 at Nagpur and the erstwhile regional stations of Indian Agricultural Research Institute (IARI) at Coimbatore and Sirsa were transferred to CICR in 1976 and 1985 respectively to cater to the research and development requirements of Southern and irrigated Northern zones respectively. Since then, cicr has been actively involved in improving the production, productivity and profitability of cotton cultivation under different agroclimatic zones of the country through the development of commercially viable and ecologically sustainable production and protection technologies. It has revolutionized the cotton cultivation through the development of improved varieties and hybrids to tailor the farmers' needs in each agroclimatic cotton zone.

2. TECHNOLOGIES DEVELOPED:

During the course of more than 20 years, under its mandate, CICR has developed many production and protection technologies to augment cotton production and protection technologies to augment cotton production without deteriorating the natural resources base. It has also developed expertise to conduct indepth fundamental research in various disciplines. CICR is now geared up to transfer these technologies/ expertise through consultancies, contractual research and training programmes to different clients. Some of the technologies developed by the Institute are as follows:

2.1 Division of Crop Improvement

2.1.1 Varieties and hybrids released recently

LRK 516 (Anjali)-A semidwarf, compact, early maturing *G.hirsutum* variety suitable for closer planting and easy care pest management .

CNH 36: *A.G.hirsutum*, superior medium staple, early maturing variety with high sympodial branching and synchronous bursting habit. Recommended for south and mid Gujarat and western Maharashtra.

CICR HH1 (Kirti): A superior medium staple intra-hirsutum hybrid (25.8 mm) with 35.1% ginning out turn and spinning capacity of 30-40 counts. It is early in duration (160 days). It also possesses moderate tolerance to major diseases and bollworms than some of the existing hybrids and could escape to some extent from the bollworm damage due to early from the bollworm damage due to early maturity. It has strong and fine fibre.

Arogya-*A.G.hirsutum* variety involving diploid wild species *G.anomalum* with high degree of resistance to bacterial blight and sucking pests. Early maturing (150-160 days), dwarf and compact plant type, 37-38% GOT, short staple (20.6 mm), yield potential of about 30 q/ha, spinnable to 12 counts by rotor-open end spinning, suitable for Denim and canvas for export.

Suvin: *G.barbadense* variety with high spinning potential (120s), suitable for irrigated tracts of southern cotton zone.

HB 224: Interspecific (tetraploid) extra-long staple hybrid recommended for irrigated tract of southern cotton zone.

Surya(TM-1312): An intra-hirsutum hybrid, with 165 days maturity, extra long staple, capable of spinning upto 60s counts. Recommended for cultivation in Andhra Pradesh and Tamil Nadu.

MCU-5 VT: *G.hirsutum* variety with 60s spinning potential, tolerant to *Verticillium* wilt with all characters of MCU-5.

VRS-7 (Surabhi):*G.hirsutum* variety highly resistant to *Verticillium* wilt, moderately resistant to jassids, yield of 19 q/ha, other characters are like MCU 5.

Om Shankar: An intra-hirsutum hybrid, semi-compact, sympodial type, 170-175 days maturity, superior medium staple fibre, GOT 34%, 30s counts with yield potential of about 20 q/ha., released for North zone.

Shruti: An inter-specific (*hirsutum* x *barbadense*) early and compact hybrid capable of spinning upto 80s, recommended for Tamil Nadu, Andhra Pradesh and Pondicherry.

2.1.2 Hybrid seed production technology:

The ideal technique and a restricted crossing period for hybrid seed production has been identified for central zone. Increasing the yield as well as quality of seed through foliar sprays and crop management has been evolved.

2.1.3 Utilisation of wild species of cotton

Utilization the wild species *G.anomalam*, the variety Arogya with immunity to bacterial blight was evolved. Synthetic polyploids involving wild species of *Gossypium* have been produced and introgressed lines with desirable economic attributes are being isolated for contributing to the germplasm.

2.2 Division of Crop Production

2.2.1 Integrated nutrient management (INM): INM techniques for sustainable cotton Production has been developed using a combination of organic and inorganic sources. The nutrient management technique is tailored to minimize nutrient losses and lock up through fixation and provide nutrients matching with the crops uptake pattern.

2.2.2 Soil moisture conservation and watershed management: The rainfed cotton region offers great potential for sustainable production through watershed management programme. Technologies for reducing soil erosion through runoff, in-situ moisture conservation and water harvesting methods for providing protective irrigation besides recharging ground water has been identified. Watershed management approach also encompasses designing land configuration / management practices to achieve the above objectives.

2.2.3 Intercropping system: An entire package for cotton based profitable intercropping system to optimize production of component crops has been identified. This practice would minimize climate imposed risks of rainfed farming besides improving soil health and stability of the system.

2.2.4 Use of biofertilizers: Use of biofertilizers viz. *Azotobacter*, *Azospirillum*, phosphate solubilising microorganisms (PSM), and *Trichoderma* in the integrated cotton production technology for reducing the cost of fertilizer and the adverse ecological impact of fertilizers.

2.2.5 Integrated weed management: Cotton being a long duration crop with slow initial growth rate, the critical period for which cotton crop requires protection against weeds is longer than most other field crops requires protection against weeds is longer than most other field crops and consequently, the cost of weed management is higher. A cost effective and less sophisticated, integrated weed management technique combining manual,

chemical, cultural and mechanical (using locally available implements) measures has been developed.

2.2.6 Production of organic cotton: An ecologically and economically sustainable organic cotton production technology has been perfected blending the native wisdom along with the virtues of bio-control based pest management and integrated soil fertility management using non-chemical inputs viz. vermicompost, FYM, green manure, biomulches, biofertilizers, in situ soil moisture conservation etc.

2.3 Division of Crop Protection

2.3.1. Integrated disease management: The disease management system has been developed which includes seed treatment, protection from foliar diseases, boll rot and soil borne diseases consisting of host resistance, chemicals, biocontrol etc.

2.3.2 Integrated pest management (IPM): This includes various components, like monitoring, use of biocontrol agents, host resistance botanicals, cultural practices etc.

2.3.3. Insecticide resistance monitoring and management: Monitoring system has been standardized and the technique developed to monitor the resistance in the field itself. The resistance management system has been evolved.

2.3.4. Mass production protocol for bioagents against cotton pest and diseases: Mass production techniques have been standardized for predators, parasites, insect pathogens and antagonists.

2.3.5. Microbial composting: The technology to prepare compost with farm waste using degrading microorganisms has been developed

2.4. Plant physiology and Biochemistry:

2.4.1. Bud and boll shedding: Management techniques to reduce physiology bud and boll shedding by foliar sprays and increasing the productivity of rainfed cotton by suitable source sink manipulations.

2.4.2. Screening techniques for abiotic stresses: Screening techniques for drought, salinity, waterlogging, temperature and low light stress have been standardised.

2.4.3. Physiological disorder: Diagnostic and remedial measures for different disorders like the bad boll opening, leaf reddening etc have been perfected.

2.5. Biotechnology:

2.5.1. Tissue culture: Technology for regeneration of cotton plants through multiple shoot induction has been standardised.

2.5.2. Techniques of molecular biology: DNA isolation and characterization techniques are perfected.

3. TRAINING

Training is an important area where cotton scientists can effectively participate for technology transfer and utilization of knowledge base available with the Institute availing the Institute's training facilities. Its personnel can organize training programmes for clients from India and abroad. The clients will however, be charged. The subject matter of the training programmes available are mentioned in annexure I. A copy of proforma for nominating a trainee is given below:

3.1. Proforma for nominating a trainee:

1. Name of the Institute:
2. Title of the training course:
3. Name and address of the trainee:
 - a) Name
 - b) Postal address
 - c) Telegraphic address
4. Date of birth:
5.
 - a) Present post held with scale of pay
 - b) Present basic pay
6. Education qualification
7. Experience
8. Particulars of course fee remitted:
 - a) No. and date of draft
 - b) Name of the bank on which draft is drawn
9. Particulars of nominating authority:

Signature of the nominating authority
or any other person authorized on his behalf

Foreign nationals sponsored by FAO, USAID, IDRC, British Council, Commonwealth Secretariat, UNESCO, World Bank, IFC, UNDP, IMF, other bonafide organizations and also the candidates sponsored by their home countries could be considered for admission to the training courses conducted by the Institute with prior approval of the ICAR Headquarters. In case of the candidates sponsored by the Govt. of India under schemes like Colombo plan, ITEC, cultural exchange programmes the prescribed fees will be suitably reduced by excluding Institutional charges wherever considered necessary by the Council. Training charges in the case of candidates sponsored under bilateral agreements could be mutually agreed/negotiated, if necessary keeping in view the commitment of the Govt. of India.

Application for admission to a training course from foreign national will not be entertained directly under any circumstances. A copy of proforma for sponsoring foreign nationals for admission to a training course organized by the Institute is given here.

2. Proforma for nominating candidates for training from outside India:

1. Name of the nominee:
2. Title of the training programme for which nominated:
3. Details of the project of nominating agency under which nominee has been sponsored:
4. Particulars of nominee:
 - a) Nationality
 - b) Date of birth
 - c) Educational qualification
 - d) Present post held with total emoluments drawn (in Indian Rupees)
 - e) Whether nominated for any other training programme in India in the past and if so, full details thereof.
 - f) Whether the candidate has been in India in the past: Yes/No.
 - g) In case the answer to the previous question is yes, following details should be given.

Full address of the place Where stayed	Period	
	From	To
1.		
2.		

5. Details of course fee remitted:

Signature of the nominating authority
or any other person authorized on his behalf

A copy of the proforma duly complete should be forwarded to Dy. Director General (Crop Science) for getting approval of Director General, ICAR.

Annexure-I

Training programmes undertaken at the Institute:

Sl. No	Item	Period (days)	Particulars (No.)	Fees/ Person	Prerequisite If any
1.	Farm implements	6	15	5000	Off season
2.	Recycling of farm wastes Vermicomposting Microbial composting	5	5	5000	Off season
3.	Mass production of bioagents	10	10	15000	Off season
4.	IPM in cotton based cropping system	25	10	27000	Sept – Oct
5.	Organic crop production	5	10	5000	Sept
6.	Integrated weed management in cotton based cropping systems	5	5-10	5000	Aug-sept
7.	Integrated nutrient management	6	10	5000	Sept
8.	Conservation and utilization of rain water for optimizing farm productivity	5	5-20	5000	Oct-Nov
9.	Soil testing and plant analysis for fertilizer recommendation	5	10	5000	Dec-Jan
10.	Cotton production technology	5	10	5000	Sept
11.	Screening techniques for abiotic stresses	7	10	5000	Sept-Nov
12.	Diagnosis & amelioration of physiological disorders	5	10	5000	Aug-Nov
13.	Seed production	5	10-15	1000	Sept-Oct
14.	Conversion of lines into CMS/GMS base	10-15	5	8000	Oct-Nov
15.	Tissue culture	10-15	10-15	8000	Off Season

16.	Molecular biology techniques	10-15	15	10000	Off Season
17.	Germplasm conservation and utilization	10-15	6	5000	Oct
18.	Seed pathological techniques	10	10	14000	Off Season
19.	Insecticide resistance	7	20	5000	Off Season
20.	Utilization of wild species for development of superior cotton	5	15	5000	Off Season
21.	Seed testing	10	10	2000	Off Season
22.	Testing of seed purity by electrophoresis	5	10	5000	Off Season
23.	Seed oil analysis	5	10	5000	Off Season

Note: Contact CICR for latest charges

4. CONSULTANCY

CICR is in position to offer Advisory Consultancy and General Consultancy services on the various technologies developed.

4.1 Advisory Consultancy:

Wherein the services would involve scientific, technical, engineering or other professional advice provided to a client purely on the basis of available expert knowledge and experience of individuals rendered, outside the ICAR without envisaging use of Institute facilities (including experimental, informational, competition, etc.) and also not involving any kind of survey, detailed study or report preparation /submission.

4.2 General Consultancy:

Wherein the services shall comprise scientific, technical, engineering or other professional advice/assistance based on the available knowledge / expertise of the Institute and envisaging only minimum use of ICAR / Institute facilities for essential experimentation needed to meet the objectives of the consultancy assignment. General consultancy may, inter-alia cover:

- Preparation of literature/survey/feasibility studies / state of art/ project/ technology forecasting reports.
- Interpretation and validation of test results and data.

- Implementation of the project up to pre-run level.
- Evaluation of projects.
- Design engineering related to Agriculture and
- Assistance in management of pests and other entomological and pathological problems etc.

Any consultancy assignment which does not strictly fall under the category of Advisory consultancy shall be taken up as general consultancy. The competent authority for approving the consultancy shall have powers to decide on the category of a particular consultancy assignment in consultation with CPC.

The proposals for consultancy services may be reviewed by Govt. or non-Govt. organizations, multinational companies, industries, big business house, farmers associations, non-resident Indians, foreign organizations etc.

Proposals for consultancy assignments will be submitted in the prescribed proforma as below:

4.3 Proforma for sanction of consultancy project:

1. Project Title and Number:
2. Client/Customer:
 - a) Name and address:
 - b) Category:
(Government Department, Voluntary/
cooperative agency/Farmer's Association/
Research organization/ multinational firm
registered in India/ Public sector/Private sector/
International Agency)
3. Whether the proposal falls under
 - i) Advisory consultancy:
 - ii) General consultancy:
4. Detailed outline of work envisaged under the project
5. Terms of reference of project
6. Objectives, scope and duration of project
7. Programme of work with phasing and milestones
8. Benefit to client on utilization of project

9. Consultancy fees, if any, offered

Signature of the client

4.4 Terms of payment:

50% of the fees should be paid by the client or client

4.5 CICR can give consultancy on the following technologies generated in the Institute.

- i) Hybrid seed production technology including conversion of varieties / lines to CMS / GMS base
- ii) Seed production
- iii) Breeding methods: Development of varieties / hybrids: GMS, CMS conversion techniques.
- iv) Utilisation of wild species to develop superior cotton
- v) Water shed management and soil moisture conservation
- vi) Organic cotton production
- vii) Mass production of bioagents, antagonists, biofertilizers and decomposing microorganisms
- viii) IPM
- ix) Integrated nutrient management
- x) Insecticide Resistance Management
- xi) Bud / boll shedding management
- xii) Tissue culture and transformation
- xiii) Hydroponics / waterculture
- xiv) Physiological disorders and their diagnosis
- xv) Cotton Seed oil estimation
- xvi) Usage of growth regulators / retardants / defoliant
- xvii) Seed storage problems-pathological and entomological

5. CONTRACT RESEARCH

Scope

Contract research comprises all research activities undertaken through specific contractual arrangements agreed upon for the purpose. The contracting parties could be public or private state universities for a specific job for short-term and long-term benefits or institutions outside the ICAR system for taking advantage of the expertise and infrastructure available in the Institute. The areas of contract research could be product development, technique perfection, technology development, variety evaluation, technology transfer, etc.

Contract research would normally be undertaken with private organization, provided these fall within the mandated areas of the Institute.

The Contract research will cover following 3 types of projects:

5.1. Sponsored Project: These projects would be wholly funded the client having specified research objectives, and well defined expected project outputs / results. Such projects may be multi-client also, with more than one sponsors sharing the project funding and research results.

5.2. Collaborative Project: Collaborative projects would involve partial funding by the client, and be supplemented by provision of inputs such as expert manpower, production / fabrication of product in bulk for testing / trial , infrastructural facilities, etc. Such projects may be for upscaling / improving of laboratory level knowhow, technology development or generation of intellectual property, etc. Like sponsored projects, the collaborative projects will also have well defined project outputs / results.

5.3. Grant-in-aid Project: These projects would involve grant by way of financial inputs, either in full or in part, assistance in kind, eg. Equipments, training etc. to supplement the institutional efforts in ongoing or new research projects or for creating new capabilities / facilities. Such projects would normally be undertaken for supporting basic or exploratory research or for maintaining large / nationally important R and D groups or testing new varieties / materials and developing infrastructural facilities. The funds for grants would generally be sought from government departments / organization or international bodies. However, well established industrial and business houses may also provide such grant-in aid.

5.3.1. Purpose of Contract Research:

The contract research may be undertaken for the following purposes:

- i) Evaluation and verification of the technology / process and product development including economic evaluation of new crop and animal varieties and farming practices.
- ii) Refinement and upgradation of new package of practices, pilot plant development, marketing, research for crop varieties etc.
- iii) Preparatory work for development and formulation of Research Project proposals.
- iv) New product, process and technology development in emerging areas related to agriculture like disease diagnostic kits, tissue / cell culture etc.
- v) Futuristic basic and applied research and generation of additional resources.

5.5 Procedure for Contract Research:

- i) CICR has identified few areas of activities, within its mandate, where there is scope for contract research project.
- ii) This will be circulated widely so that all the prospective clients may have opportunities to see them. The contract research may be undertaken with farmers, development agencies, entrepreneurs, Government Departments, and Non-Government Organizations, provided such research is mutually beneficial to the Institute and the contracting party.
- iii) On receipt of a request / proposal from a client for contract research, the institute will examine it to verify the relevance of the project in the light of the Institute's mandate.
- iv) In the event of approval of the proposal, an MOU will be signed between the Institute and the contracting party (ies) indicating the terms and conditions for undertaking the research and sorting the research output.
- v) The terms and conditions and agreements for contract research with foreign clients shall be decided on a case to case basis in consultation with the ICAR Hqrs.

5.6 Duration of Project

The duration of contract research project may vary from case to case basis. However, the maximum limit would be 5 years.

5.7. Monitoring

- i) A committee comprising Director of the Institute, the Project Leader of Contract Research Project, Senior Administrative Officer/Senior Finance & Accounts Officer of the Institute and one representative of the contracting party, would be responsible for monitoring and reviewing the progress of the project at suitable intervals depending on the duration of the project and apply mid-term corrections wherever necessary.
- i) For long-term projects (4-5 years) the Monitoring Committee will meet annually. For short-term projects, the Committee would meet at least thrice during the tenure of the project-one at the beginning, mid-term and at completion of the project.
- ii) The project Leader will submit reports on progress of work at the end of every 6 months and final report at conclusion of the project. For a project of less than 6 months there would be only one report. In case the reports are classified, these should be duly notified and further publicized as soon as these are declared declassified.
- iii) On completion of the project, the Institute will demonstrate the KNOWHOW generated to the authorized representative of the contracting party after submission of final report. The criteria of successful demonstration may be settled in advance in the agreement/or before the commencement of demonstration. On completion of the demonstration both parties shall sign a certificate to that effect.
- iv) Provision will be made to maintain separate accounts of contract research schemes and monitored at regular intervals by Senior Finance & Accounts Officer of the Institute.
- v) In case of any dispute with the contract research projects, the decision of the Director/ Institute Management Committee/DG, ICAR (as the case may be) will be final and binding on both the parties. Otherwise, the matter may be resolved through arbitration, if specifically outline in the contract agreement.
- vi) Information on all contract research shall be provided to the Monitoring Cell at the ICAR Hqrs.

5.8. Financial Aspects:

Costing of contract research projects: The charge for contract research project shall include:

i) Expenses

- a) Cost of man-days of staff deployed
- b) Cost of physical inputs/services/utilities/consumables/raw materials/components with 20% overhead
- c) Equipment usage cost/of equipment procured specifically for the project, if any. The element of depreciation of assets will be taken into account while fixing this cost.
- d) External payment envisaged, eg. for hiring infrastructural facilities, experts, computer time, information etc.
- e) Travelling expenses and daily allowances
- f) Contingencies

Total Expenses Sum of (i) (a) to (f)

ii) Intellectual fee:

To be decided by the Competent Authority (Minimum of 60% of cost of man-days of staff deployed)

Total project charges : Total expenses + Intellectual fee (i+ii)

In case the contract research leads to generation of intellectual property, provision and charges for licensing the use of intellectual property to the client should be additionally specified. In case of collaborative projects, since take into account the part of project costs expended/ borne by CICR.

5.9 Research output:

On successful completion of the project, a final report will be prepared by the Project Leader which will be placed before the Monitoring committee for approval. On approval by the Monitoring Committee, the client will accept the report by signing an undertaking to that effect. Final report of the Project, once approved by the Monitoring Committee, will be the final. CICR will not entertain any request for review or modifications of the report, based on any subsequent review made by the client or a third party.

Publications: The client shall be consulted prior to publishing any research result arising from the contract research work. The research output of the contract research shall be sole ICAR./joint property of the Institute and the contracting party (ies). Further, any IPR received under the contract research will be a sole ICAR joint property and the profits accruing out of such invention/research work will be distributed between CICR and the contracting party as per ICAR IPR Rules.

5.10 Intellectual property:

- (A) **Sponsored Research:** The ownership of the intellectual property generated shall be of ICAR which will obtain and maintain the relevant intellectual property rights at its cost. The decision, whether or not an intellectual property right is obtained, shall be that of the Director of CICR which shall be final and binding on the sponsorer.

(B) Collaborative Research: Intellectual property generated through projects with technical contribution from the collaborator shall be jointly owned. Both the ICAR and the collaborator shall bear equally the expenses for obtaining and maintaining the intellectual property rights. The decision intellectual property rights be whether or not secured shall jointly be taken by the Director, CICR and the collaborator.

(C) Grant-in-aid-Research: Intellectual property rights in case of government departments and agencies may be as per their standard terms and conditions. However, where the grantor has no standard conditions and for non-governmental agencies, ownership rights shall be that of the ICAR.

5.11 Licensing of Intellectual Property:

(A) Sponsored Research:

- i) The rights of licensing intellectual property shall vest with the ICAR.
- ii) The sponsor shall be given the first right for commercial exploitation of intellectual property. However, this right shall be exercised by a written communication to the Institute within 6 months commencing from the receipt of final report. In the event the sponsor fails to exercise his option within the specified period or having done so fails to commercially exploit the intellectual property within stipulated time-frame, ICAR shall be free to license the intellectual property to others and the money accruing there from shall be shared equally between the ICAR and sponsor with a ceiling on the sponsor's share equal to the amount the sponsor had paid to the ICAR as sponsorship charges.
- iii) Wherever feasible, the sponsor shall be given a non-exclusive licence failing which an exclusive licence of limited period of time, normally not exceeding 5 year, for commercial exploitation of the intellectual property be given.
- iv) ICAR shall have the right to license the intellectual property to any other party on the terms and conditions it may decide in the case where it has granted non-exclusive licence or in case of exclusive licence on the expiry of the exclusivity period. In such cases, if the licensing of intellectual property is only by the ICAR without any further assistance of the sponsor, then the money realized shall be shared on a 50:50 basis with a ceiling on the total amount receivable by the sponsor to the amount the sponsor has paid to ICAR as sponsorship charges. In case the ICAR seeks assistance of the sponsor to license that intellectual property, the sharing of the money shall be specifically negotiated depending upon the inputs to be provided by the sponsor.
- v) Notwithstanding the exclusive licence granted to the sponsor, the ICAR shall have the right to licence the intellectual property during the period of licence if:

- a) There is a proposal before Government of India for import of the same/similar intellectual property as developed under the sponsored project; or
- b) Government of India desires ICAR to disclose the intellectual property for its own use.

In such cases the money accruing there from shall be shared equally between the sponsor and the ICAR without any ceiling on the share of the amount receivable by the sponsorer.

(B) Collaborative Research:

- i) The right licensing of intellectual property shall be jointly held by the ICAR and the collaborator.
- ii) The collaborator shall have the first right of commercial exploitation of intellectual property. The right shall however, be exercised by the collaborator by a written communication to the Institute within a prespecified period of time not generally exceeding 6 months, commencing from the receipt of final report. In such a case, the intellectual property shall be licensed to the collaborator for exploitation on terms to be mutually decided between the ICAR and the collaborator.
- iii) In the event the collaborator fails to exercise the option or fails to commercially exploit the intellectual property within the prespecified period, ICAR shall have the right to licence the intellectual property to others on terms to be mutually decided between the collaborator and the ICAR. In such a case the money accruing shall be shared with the collaborator, commensurate to his inputs in the project and in transfer of technology.
- iv) Where feasible, the collaborator shall be given a non-exclusive licence failing which, an exclusive licence failing which, an exclusive licence for a limited period of time, normally not exceeding 5 years, for commercial exploitation of the intellectual property be given.
- v) The intellectual property can be licensed to others by the ICAR on terms and conditions to be mutually agreed upon between the ICAR and the collaborator in case of non-exclusive licence granted and for exclusive licence on expiry of the exclusivity period.
- vi) Notwithstanding the exclusive licence granted to the collaborator, the ICAR shall have the right to license the intellectual property, during the period of exclusivity if;
 - a) There is a proposal for import of same/similar intellectual property as developed under the collaborative project; or
 - b) Government of India desires the ICAR to disclose the intellectual property for its own use.

The money accruing shall be shared between the ICAR and the collaborator commensurate with inputs provided by each party to the project and in technology transfer.

(C) Grant-in-aid Research:

Licensing rights of intellectual property in cases of government departments and agencies may be as per their standard terms and conditions. However, cases where the grantor has no standard conditions and for non-government agencies, licensing rights shall be that of the ICAR.

5.12 Ownership of prototype/ products: The ownership of prototypes/products that may be produced during the sponsored work shall normally be the property of the sponsor and for collaborative and grant-in-aid projects the ownership shall be specifically agreed upon between the ICAR and the collaborator/grantor and included in the agreement.

5.13 Responsibility of the contracting party: The CONTRACTING PARTY shall provide all the basic data available with it and afford all facilities to the INSTITUTE for fulfillment of the research under the agreement. [In case of collaborating research [please also specify inputs eg. Financial/consumables/ raw material/components/equipments/product] to be supplied by CONTRACTING PARTY.

The equipment/instrument/hardware etc. [provided by/purchased at the cost of] the CONTRACTING PARTY shall after the completion of the PROJECT [remain the property of the CONTRACTING PARTY/ be purchased by the INSTITUTE at a negotiated book value]

The CONTRACTING PARTY shall permit the COUNCIL/INSTITUTE'S duly authorized officials, at all convenient times to enter into and upon any premises of the CONTRACTING PARTY where PRODUCT manufactured as aforesaid may be stored or ascertain that the provisions of this agreement are being complied with.

During the tenure of this agreement the CONTRACTING PARTY shall disclose to COUNCIL/INSTITUTE any improvement/modification made on the PRODUCT/KNOWHOW.

Fulfillment of all procedural, legal, commercial requirements for undertaking/implementing the results of the PROJECT shall be the responsibility of the CONTRACTING PARTY.

The CONTRACTING PARTY shall not, at any time, assign, mortgage, charge, grant sub-licences in respect of or otherwise deal with possession or control of the licence hereby granted.

The CONTRACTING PARTY shall provide adequate personal [equipment] Accident Insurance for INSTITUTE personnel [and Equipment] deployed at the site of the CONTRACTING PARTY in connection with the work under the PROJECT.

The CONTRACTING PARTY shall at its own cost procure/fabricate/install/commission the pilot plant/semi-commercial plant in its own premises. The INSTITUTE shall provide assistance to the CONTRACTING PARTY in erecting/commissioning/operating/starting up etc.on mutually agreed terms and conditions as provided in the agreement. The PRODUCT manufactured in the pilot plant/semi-commercial plant shall belong to the CONTRACTING PARTY.

5.14 Contract research areas of CICR:

Some of the areas where CICR can take up contract research are:

1. Testing of new molecules viz., insecticide, fungicide, bactericide, weedicide, plant growth regulators etc.
2. Testing of varieties or hybrids.
3. Screening of lines for biotic and abiotic stresses.
4. Grow out test for seed borne diseases.

6. CONTRACT SERVICE

6.1 Meaning and scope

Contract services are meant to render to the clients/customers, assistance of minor nature based on available knowledge, expertise, skills and facilities of the Institute. These would involve routine laboratory testing where neither interpretation of data/results, technical advice is rendered nor the results are processed further. The main purpose of contract service is to provide support to the external agencies in its mandated area and mobilize resources for the Institute.

6.2 Terms of Payment: A minimum of 50% of the service charges should be received by the Institute as an advance. The balance 50% may be paid by the client at the receipt of report/results of service.

6.3 Results of Laboratory Testing:

The results of laboratory testing will be handed over to the client with remarks.

- i) A copy of the report on various contract services undertaken by the Institute should be sent to the Monitoring Cell at the ICAR Hqrs. and updated quarterly.
- ii) For any dispute, the decision of the Director (s) of the Institute would be binding on the contracting parties. In multi-institutional service the power would remain with the DG, ICAR.

6.4 Some of the important areas where CICR can undertake contract services include:

- i) Testing of new molecules - insecticide, fungicide, bactericide, weedicide, plant growth regulators etc.
- ii) Testing of equipments including farm machinery.
- iii) Soil testing for macro and micronutrients.
- iv) Irrigation water quality analysis.

- v) Identification of disease specimen, pest, insect pathogen, antagonist etc.
- vi) Screening of lines for biotic and abiotic stresses.
- vii) Pesticide residue analysis.
- viii) Seed quality analysis.
- ix) Grow out test for seed borne diseases.

7. ITEMS AVAILABLE FOR SALE OR TESTING AT CICR AND THEIR CHARGES:

Items	Rate (in Rs.)
1) Breeder's seed	200/kg
2) Nucleus seed	1000/kg
3) Pure seed (TFL)	40/kg
4) GMS parent	5000/kg
5) CMS restorer	5000/kg
6) Parent's seeds of hybrids (conventional)	1000/kg
7) Hybrid seed	500/kg
8) Hybrid parent (conventional)	5,00,000/kg
9) -do- (GMS)	10,00,000/kg
10) -do- (CMS)	20,00,000/kg
11) Germplasm Catalogue	1000/copy
12) Testing of variety, hybrid etc.	5000/entry/location
13) Testing of new chemicals	10,000/doses/location
14) Seed testing for purity (electrophoresis method)	500/sample
15) Testing of pharmaceuticals with HPLC	1000/sample
16) Testing for seed oil by NMR method	250/sample
17) Testing for seed oil by Soxhlets method	1000/sample
18) Soil analysis (physical analysis) For pH, EC, Texture, Maximum water holding capacity	
one parameter	200/sample
more than one or all	500/sample
19) Chemical analysis (organic carbon, available nitrogen, available phosphorus, available potash, sodium, calcium, total nitrogen)	
one parameter	200/sample
more than one or all	500/sample
20) Water analysis (pH, EC, ammonium nitrate, Nitrogen, Sodium, potash, Calcium, Chlorine, Carbonate, Bicarbonate, Sulphate)	
one parameter	200/sample

more than one or all	500/sample
21) Demonstration of private hybrids	5000/demonstration
22) Sale of NPV	175/100 LE of 2×10^9 POBs
23) Bt for demonstration/ experiments Chrysoperla	800/L. with 16000IU/mg
Trichogramma	10/100 eggs
Bracon	0/20000parasitoids
24) Testing of organic manure	30/100 adult parasite
25) Testing of seed samples	10,000/treatment/location
Germination/viability	200/sample
Seed viability	200/sample
Moisture content of the seeds	200/sample
Physical purity	200/sample
Seed borne diseases	400/sample
Genetic purity	400/sample
Seed health status	400/sample
26) Testing seed dressing fungicides/chemicals/biological agents/ Natural (herbal) products	10,000/samples
27) Grow out test for seedborne diseases	1000/samples
28) Cultures of different Bacteria, fungi	200/culture
29) Sale of tender form	0.1% of the cost of the Material/equipments with Min.Rs.50/-&max.1000/-
30) Library cotton data base	Rs.2 per copy.

Note: Contact CICR for latest charges