

APPLICATION FORM FOR PARTICIPATION IN TRAINING

(At Central institute for Research on Cotton Technology, Mumbai)

1. Full name (in block letters) :
2. Designation :
3. Present employer and address :
4. Address to which reply should be sent
(including email, mobile and fax)
5. Permanent Address:
6. Date of Birth :
7. Sex : Male/Female
8. Teaching/research/professional experience (mention post held during last 5 years and number of publication refereed journals) :
9. Marital status : Married/Unmarried
10. Mention if you have participated in any research seminar, Summer/Winter School/ Short Course, etc. during the previous years under ICAR/Other organizations:
11. Whether accommodation is required: Yes / No
12. Academic record

Examination passed	Subject Main / subsidiary	Year of passing	Class / Ranks / Distinctions etc.	University or Institution	Other information
Bachelor's					
Master's					
Ph.D					
Others					

Date_____

Place_____

Signature of the applicant

13. Recommendations of forwarding Institute

CERTIFICATE

It is certified that the information furnished above
has been verified and found to be correct.

Signature _____

Date_____

Director / Head of the organization

Institute Seal _____

How to reach CIRCOT

From Airport (Domestic) : 10 km
From Airport (International) : 12 km
Nearest Railway Station : Dadar (1.0km)
Nearest Bus Stop: Kapol Nivas in Dr. Ambedkar Rd,
Matunga East and Five Gardens bus stop
Landmark: Five Gardens

Weather

In the month of October, the mean maximum is around 32°C and mean minimum is 24°C making it sultry during the day and pleasant during the night.

Important dates to remember

Last date for receipt of nomination: Sept 15, 2011

Intimation to selected participants: Sept 20, 2011

Confirmation by participants : Sept 26, 2011

Course commencement : Oct 10, 2011

Address for Correspondence

Dr. N. Vigneshwaran
Scientist & Course Director
Central Institute for Research on Cotton Technology,
Adenwala Road, Matunga, Mumbai – 400 019.
Maharashtra

Email: nanotechtraining@gmail.com;

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Updates are available at www.nanocellulose.in OR
www.circot.res.in

National training course

On

“Nanocellulose and its composites in Agriculture”

October 10-24, 2011

Organized by

**Central Institute for Research on Cotton
Technology (CIRCOT),**
Adenwala Road, Matunga,
Mumbai – 400 019, Maharashtra, India



Sponsored by the

Indian Council of Agricultural Research

Krishi Anusandhan Bhawan-II,
New Delhi – 110012.

Under the NAIP sub-project “Synthesis and
Characterization of Nano-Cellulose and its
Application in Biodegradable Polymer Composites to
Enhance Their Performance”, code no: 4 171 01

Introduction

Agro-biomass is composed mainly of cellulose, hemicellulose and lignin. Cellulose, the most abundant polysaccharide on Earth, is a highly ordered polymer of cellobiose. Though the potential availability of agro-biomass in India is around 268.5 million tonnes per annum, the dominant use is for fodder and fuel. Value addition to this biomass could offer large benefits in terms of sustainability, security, and rural economic development. Among the total production of 280 lakh bales of cotton fibres per annum, a substantial quantity (about 15 to 18 lakh bales) is available for non-mill purposes, including stuffing of mattresses and furniture, preparation of surgical, absorbent cotton, etc. Apart from cotton that contains more than 95% cellulose, wood and other crop-residues contain up to 50% cellulose. Value addition to cellulose is carried out by acid hydrolysis to yield microcrystalline cellulose for its various applications. However, the low aspect ratio and intervening amorphous region of microcrystalline cellulose make it unfit for use as fillers in composites. Hence, the preparation of nano-cellulose and their use as fillers in various composites will be a value addition to non-spinnable cotton, cotton linters and other cellulosic biomass. The tensile strength of ramie, flax, jute, wood and cotton is well below 1.0 GPa while that of cellulose nano-crystals is 10 GPa and this explains the projected potential of nanocellulose in composites.

Global production capacity for biodegradable polymers has grown dramatically since the mid-1990s. In 2006, global production capacity for biodegradable polymers was around 360,000 tonnes compared with 20,000 tonnes in 1995. Renewable resource based biopolymers such as starch and other biodegradable polymers account for around 85% of the total production capacity with synthetic

biopolymers accounting for the remaining 15%. The most widely used agricultural plastics are mulch films which cover more than 4 million hectares worldwide. Despite the availability of biodegradable polymers, the lack of structural and functional stability prevents their commercial use. There is a strong potential for low-cost starch and cellulose based polymers for commodity applications, particularly since the monomer can be obtained from renewable agricultural resources. But, high water vapour permeability and poor mechanical strength prevents their large scale exploitation. The use of nanocellulose as filler could improve the performance of these biodegradable films due to its high crystallinity and better interfacial interaction. The fairly new idea of bio-nanocomposites is an initiative to develop next generation novel eco-friendly packaging materials with superior performance that could find extensive applications in food packaging and agricultural field mulching.

Objectives

In the light of aforesaid views, the major objectives of the training course are:

- √ To acquaint participants with basics of nanotechnology
- √ To impart training on preparation and characterization of nanocellulose
- √ To demonstrate the production, characterization and application of bio-degradable nanocellulose-polymer composite films

Curriculum

A series of lectures and practical demonstrations will cover the basics of nanotechnology, preparation and characterization of nanocellulose by chemical, biological and mechanical processes and their application as fillers in polymer composites.

A visit to nearby nanotechnology laboratory is also planned. This Institute is well equipped with machineries for nanomaterials synthesis (homogenizer, ball mill, refiner, membrane reactor & fermentor) and characterization (atomic force microscope, particle size analyzer).

How to apply

Interested candidates can apply in the enclosed proforma. The application duly forwarded by the competent authority of the sponsoring organization should reach the Course Director on or before 15th September 2011.

Eligibility

Applicant should be a post-graduate in any discipline of agriculture or related basic science and working as Scientist in ICAR institutes or as Assistant Professor and above in any of SAUs / Central Agricultural University / Deemed University / General University with agriculture faculty and Krishi Vigyan Kendra.

Boarding and Lodging

Participants will be paid travel fare of to and fro journey by rail or bus as per their entitlement, restricted to the maximum of AC II Tier. TA will be paid on production of tickets. Free boarding will be provided during this training programme. Free lodging shall be provided on first come first serve basis. Since the accommodation is very limited at this institute, participants are requested to arrange for their stay. Cash allowance in lieu of boarding & lodging are not permitted. Local participants will be provided with lunch and inter-sessions tea only.