



## *National Training Course*

*On*

## **Nanoparticle Production, Characterization and Utilization in Agriculture**

**February 23-March 03, 2012**

### **Organized by**

**Central Arid Zone Research Institute  
(CAZRI) Jodhpur**

(Indian Council of Agricultural Research)

Jodhpur-342 003, Rajasthan, India

Sponsored by

**National Agricultural Innovation Project  
(Component IV)**

Indian Council of Agricultural Research

Krishi Anusandhan Bhawan-II

New Delhi – 110 012

## **Introduction**

Nanotechnology is the study of manipulating matter on an atomic or a molecular scale that deals with particle sizes between 1 and 100 nanometer at least in one dimension. This frontier area of technology has the potential to revolutionize the agricultural and food industry with new tools for the molecular treatment of diseases, rapid disease detection, enhancing the ability of plants to absorb nutrients etc. Materials reduced to the nanoscale show some properties which are different from what they exhibit on a microscale, enabling unique systemic applications. The interesting and sometimes unexpected properties of nanoparticles are broadly due to the large surface area of the material, which dominates the contributions made by the very small quantities of the material. Nanoparticles, thus, take advantage of their dramatically increased surface area to volume ratio.

Agriculture is the backbone of the developing countries, with more than 60% of their population relying for their livelihood on this sector. The intense problems confronting productivity in agriculture, such as several abiotic and biotic stress factors, require more precise and effective solutions; and products with higher efficacy are further required to mitigate the stress. Nanotechnology can improve our understanding and also deliver better products. It can contribute to the development of improved systems for monitoring environmental conditions and delivering nutrients or appropriate pesticides and thus potentially enhance yields or nutritional values. Thus, nanotechnology can be an important part of the future agriculture, food systems and industry. Training and research in nanotechnology, therefore, have very high relevance and importance.

CAZRI is presently engaged in a sub-project under NAIP on “Nano-technology for Enhanced Utilization of Native - Phosphorus by Plants and

Higher Moisture Retention in Arid Soils”. NAIP (ICAR) also aims at developing capacity to train human resource in various fields of agricultural research including nanotechnology, and this national training is being organised as a part of such endeavour. CAZRI has facilities for biosynthesis of nanoparticle, their characterization and related facilities for response studies, and is well equipped with latest state of art instruments like i.e. Particle Size Analyzer, Fourier Transformed Infrared Spectroscopy, Sonicator, Ultracentrifuge, and Biosafety Cabinet etc. The institute shall offer a unique opportunity for the participants to expose themselves in the field of nanoscience in relation to agriculture.

**Objectives-** This training will mainly focus on:-

1. Acquaintance with fundamentals of nanotechnology
2. Physical, chemical, biological and aerosol synthesis, and characterization of metal nanoparticles
3. Development of nanoparticle induced polysaccharide powder and its characterization
4. Application of nanoparticles in agriculture and allied sectors

**Curriculum-** A series of lectures and practical demonstrations will cover the basics of nanotechnology, synthesis of nanoparticle from biological sources, isolation, purification and characterization of microbial polysaccharide and their applications in various fields, and related aspects.

### **Course Director**

Dr. J. C. Tarafdar - Consortium Principal Investigator, NAIP sub-project on Nano-Technology (417001) & National Fellow, CAZRI, Jodhpur

## International Resource Person

**Prof. Pratim Biswas**- Chairperson of the Department and the Director of McDonnell Academy Global Energy & Environmental Partnership, Washington University, St. Louis, USA.

**How to apply**- Interested candidate may apply in the enclosed performa. The duly filled application should reach the Course Director on or before 25th January 2012.

## Eligibility

Applicant should be a post graduate in any discipline of agriculture or allied science and working as Scientist/Assistant Professor or higher positions in ICAR institutes/ SAUs/ Central Universities/ Deemed University/ General University and Krishi Vigyan Kendra.

Selection based on short listing of applications and preference will be given to those who have not undertaken similar training anywhere. Decision of Course Director shall be final.

## Number of seats: 15

**Boarding and Lodging**-Participants will be paid travel fare of to and fro journey by rail or bus as per the entitlement, restricted to the maximum of AC II tier of the shortest route. TA will be paid on the production of original tickets. Free boarding will be provided during this training program. Free lodging shall be provided on first come first serve basis.

## Important dates to remember

Last date for receipt of nomination: Jan. 25, 2012  
Intimation to selected participants: Feb. 02, 2012  
Confirmation by participants: Feb. 07, 2012  
Course commencement: Feb. 23, 2012  
Course completion: March 03, 2012

## Application Performa for Participation in Training

### ICAR-NAIP-CAZRI National Training Course on Nanoparticle Production, Characterization and Utilization in Agriculture

February 23-March 03, 2012

Central Arid Zone Research Institute, Jodhpur

Full Name (in capital letters):

Designation:

Employer address:

Postal address (with Email and mobile no.):

Sex (male/female):

Research/Teaching/Professional experiences: (mention latest publications of referred journal, not exceeding five):

Marital status (married/unmarried):

Whether accommodation is required (Yes/No):

Mention, if you have participated in training, during previous years on similar theme:

Academic record	Examination passed	Subject	Year	University/ Institute	Class/ Rank/
Bachelor's					
Master's					
PhD					
Others					

Date.....

Place.....

Signature of the applicant

Reason for which training is required

Recommendations of forwarding Institute

## Certificate

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

Date.....

Signature

Institute seal Director/Head of the organization

## About Jodhpur

Jodhpur is known as the "Sun City" because of its bright and sunny weather throughout the year. Named after Rao Jodha, who established in 1459 it rose to be the second largest city of Rajasthan. Jodhpur is a very popular tourist destination. Jodhpur city has many beautiful palaces and forts such as Mehrangarh Fort, Umaid Bhavan Palace and Rai ka Bag Palace. Other charms of Jodhpur include Jaswant Thada, Government Museum and its beautiful Umed and Mandore Gardens.

## Weather

In the month of February- March, weather is generally comfortable with the mean maximum temperature 30°C and mean minimum of 15°C making it the most pleasant and suitable time for such an activity.

## How to reach CAZRI

Jodhpur is well connected through Air, Rail and Bus transport and has links with all the major cities of India.

The institute can be reached by hired or personal vehicle by road. Distance from major terminals of the city is:-

From Airport: 12km

From Railway Station: 6km

From State Roadways Bus Stand: 8km

## Address for Correspondence

Dr. J. C. Tarafdar

Consortium Principal Investigator, NAIP- Nano-Technology

National Fellow Unit

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Updates are available at  
[www.cazri.res.in](http://www.cazri.res.in)