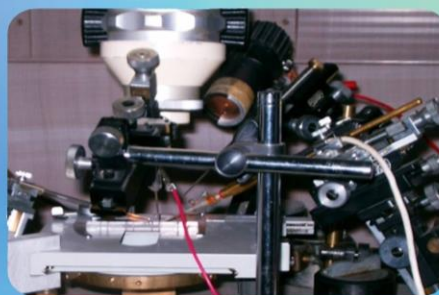
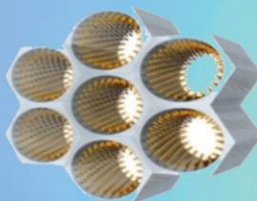
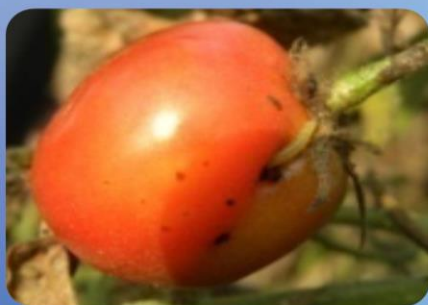




**ICAR Sponsored Short Course on**

# **Nanotechnological Approaches in Pest and Disease Management**

15 - 24 November, 2017



**Organized by**



**ICAR- National Bureau of Agricultural Insect Resources  
Bengaluru-560024**

## Background

The crop loss in India due to pest, diseases and weeds account for 15 – 25 per cent. Farmers rely on use of chemical insecticides to scale down the damage caused by insects and pathogens. Though effective, indiscriminate use of pesticides has led; build-up of residue in commodities, development of resistance and destruction of natural enemies. Compounded to this is, the presence of spurious chemical insecticides and the biologicals laced with chemical pesticides is a serious concern when used for pest management.

Biocontrol agents are a safer alternative, but their timely availability in quality and quantity is hurdle in its adoption among the farming community. Hence, there is need to search for alternatives that are effective in pest and disease management. The next generation farming is in the hands of young and educated farmers who would rely on crop protection scenario that will be heavily dependent on utilizing the cutting-edge technologies.

Nanotechnology is novel field of interdisciplinary research and it has wide scope in the field of agriculture specifically in pest and disease management. It offers materials to develop insecticide and microbial biocides that are a clean and green technology. Nanotechnology offers solution to assemble the chemistries into a matrix that would aid in controlled release coupled with protection from light and air. Nanoparticles are effective matrix for release of volatile organic compounds. The VOC loaded into the matrix has a controlled release and that causes physiological and behavioural response in insects which aids in trapping of pest. Nanotechnology offers solution in disease diagnostics for enabling disease management.

ICAR – NBAIR is a pioneering institute in entomological research globally. It has been nurturing the research in developing novel crop protection technologies. One such line of specialization that has emerged at ICAR – NBAIR is nanotechnological approaches in crop protection. Novel delivery matrix for loading the pheromones and sensors to detect the semiochemicals and xenobiotics have been developed, patented and commercialized. The knowledge so accumulated is proposed to be disseminated to have a greater capacity building in the area of nanotechnology in crop protection.

Hence, a short course on “Nanotechnological approaches in Pest and Disease Management” for 10 days will sensitize and update the knowledge of plant protection Scientists on the scope of utilizing the nanotechnology for crop protection.

## Objectives

- To expose the participants the field of nanotechnology, synthesis and characterization
- To provide hands on training on identifying the bioactive compounds that could be loaded in to nanomatrix for pest management

## Course Outline

- ✓ Introduction to nanomaterials
- ✓ Nanotechnology and its application in agriculture
- ✓ Synthesis of nanomaterials using chemical, physical and biological route
- ✓ Physical and chemical characterization of nanomaterials
- ✓ Imaging characterization of nanoparticles

- ✓ Advanced techniques in separation and determination of volatile organic compounds
- ✓ Loading of VOC into nanomatrix
- ✓ Nano sensors in plant protection
- ✓ Nanogels in pest and disease management
- ✓ Nanoprobes for disease detection
- ✓ Nanoformulations of insecticides and fungicides - synthesis and formulation
- ✓ Risk assessment technique in nanomaterials
- ✓ Ecotoxicology of nanomaterials on non-target organisms
- ✓ Nanotechnological approaches in fisheries pathology

### **Faculties/Resource Persons**

The faculties for the course would be from ICAR – NBAIR, Jawaharlal Nehru Centre for Advanced Scientific Research, National Centre for Biological Sciences, ICAR – Central Tuber Crops Research Institute, Tamil Nadu Agricultural University and ICAR Headquarters.

### **Venue, Date and Duration**

The 10 days short course will be conducted at ICAR-NBAIR, Bengaluru from 15 – 24 November 2017.

### **Target Group**

Participation in short course is open for the researchers/ teachers not below the rank of Scientist/ Assistant Professor/ Lecturer/ Subject Matter Specialist having a minimum of two years' experience in related research/ teaching / extension experience in ICAR/ State & Central Agricultural Universities/ AMU/ BHU/ Viswa Bharti/ Nagaland University/ KVK's in Entomology, Plant Protection, Plant Pathology, Nematology, Agricultural Microbiology or any other related disciplines. The number of participants for the programme will be limited to 25. The selection of the candidates will be made by screening committee as per the guidelines of ICAR in force.

### **Nomination**

Nomination for participation in the Short course may be made in prescribed proforma given herewith. Directors of ICAR Institutes, Vice Chancellors of Agricultural Universities, Heads/ Directors of University Departments and Principals of affiliated colleges can nominate one or two suitable candidates from respective Institute/ University. Preference will be given for candidates who are already working/ likely to take up research work related to control of insect pests and diseases of crops. Candidates should compulsorily upload their advance copy of the application in the ICAR CBP portal ([cbp.icar.gov.in](http://cbp.icar.gov.in)). Candidates may send the hard copy of the application through mail/ Fax/ speed post through proper channel. However, final selection will be subject to receipt of the application duly recommended by the competent authority. Candidates should bring permission and relieving letter from the respective Institute.

## Important Dates

Last date for receiving the nomination form	: 11 <sup>th</sup> September, 2017
Intimation of selection	: 12 <sup>th</sup> September, 2017
Confirmation by participants	: 20 <sup>th</sup> September, 2017
Intimation to waitlisted participants if selected	: 25 <sup>th</sup> September, 2017

A registration fee of Rs. 50/- (Rupees fifty only) per participant is fixed as per ICAR guidelines, which can be sent through postal order/DD in favour of Director, ICAR- NBAIR payable at Bengaluru along with the application form.

## Travel, Boarding & Lodging

Selected participants are eligible for TA (up to 2 AC Train fare by shortest route as per ICAR norms). Food & accommodation will be provided by the organizers. No DA is admissible to the participants. The local participants are not eligible for boarding and lodging, however, working lunch and refreshments will be provided.

## Institute Information

National Bureau of Agricultural Insect Resources is a nodal ICAR Institute at National level for research and development on all aspects of work on harnessing resources of insects including biological control of crop pests and weeds, training, information, repository, technology dissemination and National / International cooperation. NBAIR is located at Hebbal in Bengaluru opposite to CBI (Central Bureau of Investigation), next to Veterinary College, Hebbal Bengaluru. The Institute is located 5 km from Cantonment railway station, 4 km from Yeswantpur railway station and 8 km from Bengaluru city junction and 35 km from KIA airport. Buses which are plying to Yelahanka, Devanahalli, Doddaballapur, international airport will pass through NBAIR. Participants are requested to get down at CBI bus stop to reach NBAIR.

ICAR sponsored 10 days short course on “Nanotechnological approaches in Pest and Disease Management” November 15 - 24, 2017 will be held at National Bureau of Agricultural Insect Resources (NBAIR), PB No.2491, HA Farm Post, Bellary Road, Bengaluru -560 024

### Application Form for Participation in Short Course

(To be sent directly to Course Director of short course concerned)

1. Name in full (Block Letters) : .....
2. Designation: .....
3. Present Employer and Address: .....  
.....
4. Address for Correspondence: .....  
.....

5. Tel No: .....(O).....(Mob).....
6. Email: .....
7. Date of Birth and age: .....
8. Sex: .....
9. Marital Status: Married/ Unmarried
10. Teaching/Research/Professional Experience .....  
(Mention post held during last 5 years)
11. Detailed list of Publications in the relevant area: .....
12. Academic record:

Examination	Subject	Year of passing	Institution/University	OGPA/%
Bachelor's degree				
Master's degree				
PhD				
Other certificates, Diplomas etc.				

13. Mention details if you have participated in Summer or Winter Schools/ Short Courses, etc. during the previous five years under ICAR/other organizations:  
.....
14. Postal order /DD No..... Date..... for Rs.50/- (Rupees fifty only) (non-refundable) for registration of application

Signature of the applicant

### Recommendations of the forwarding Institute

Dr./Shri./Ms. .... is hereby nominated for participation in the 10 days short course on Nanotechnological approaches in Pest and Disease Management at ICAR-NBAIR, Bengaluru during November 15 - 24, 2017.

Signature

Designation & Address

### Certificate

It is certified that the information was furnished by the office record and was found correct.

Signature, Designation, Address and Office Seal of the Sponsoring Authority

## Correspondence

All correspondence to be addressed to

**Dr. Kesavan Subaharan**

Principal Scientist (Entomology)  
Course Director  
ICAR-National Bureau of Agricultural  
Insect Resources,  
Yelahanka Campus  
Near Purva Venizia Apartment  
Attur Layout  
Yelahanka New Town  
Bengaluru - 560 064  
Phone : 09483652920  
email: subaharan\_70@yahoo.com

**Dr.N.Bakthavatsalam**, Head, Division of Ecology

**Dr. M. Mohan**, Principal Scientist (Entomology)

Course Co-ordinators  
ICAR-NBAIR, Bengaluru - 560 024  
Dr. N. Bakthavatsalam  
Phone : 09886522741  
Email : bakthan.nbaii@gmail.com  
Dr. M.Mohan  
Phone: 9686785470  
Email:mohan\_iari@yahoo.com

For Further Details

**Dr. Chandish R. Ballal**

**Director, ICAR-NBAIR**

Bellary Road, HA Farm Post, Bengaluru - 560 024.

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