

Nanotechnology and Advanced Materials

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Nanotechnology lead advanced materials for agricultural pest management

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Advanced materials were synthesized using nanotechnology as a tool for pest management. These materials lead a promising technology that has attracted global, commercial and scientific interest in the recent years. Our team develop nanogels and nanosensors technology using these advanced materials for insect pest management and early pest detection in agricultural fields. We have developed a slow-release pheromone formulation for the effective management of harmful pests such as *Bactrocera dorsalis* (Hendel), *Helicoverpa armigera* (Hubner) (Lepidoptera, Noctuidae), *Scirphophaga incertulas*(Walker) (Lepidoptera, Pyralidae), *Leucinodes orbonalis*(Guenee) (Lepidoptera: Pyralidae), *Holotrichia consanguinea* (Blanchard), *Scirpophaga excerptalis*(Lepidoptera, Crambidae), *Spodoptera frugiperda*(Lepidoptera, Noctuidae), *Plutella xylostella*(Lepidoptera, Plutellidae) and many more. Further to include Artificial Intelligence for pest management using semiochemicals as cues We had fabricated and chemically functionalized a silicon dioxide-based micro electromechanical system (MEMS) sensor for the early pest detection of *Helicoverpa armigera* and *Bactrocera oleae*. In the fields, this technology (MEMs sensor) can be tagged in plants for volatile profiling also. The developed products are cost-efficient, reusable, farmer-friendly and eco-friendly. We safeguard crops by organic methods such as management of pests with slow release pheromone formulations and detecting and monitoring miniscule amounts of female sex pheromones of agriculturally hazardous pests in agricultural fields early on, before substantial outbreaks have occurred. Necessary and timely action can then be taken to battle any developing pest infestation at its earliest stages.

Biography

Dr Deepa Bhagat is working as Principal Scientist at ICAR-NBAIR. She acquired Ph.D in Organic Chemistry in 2005. She joined as Scientist in ICAR-ARS 18.11.1999. She received Prestigious Gandhian Young Technology Innovation award in 2017. She had used state-of-the-art technology to evolve gel-based carriers known as nanogels that carry pheromones. She has authored more than 25 papers in National and International journals and delivered more than 50 talks in various International and National conferences and seminars. She has more than twelve National and International patents.

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