Inter-Departmental Seminar Report for 28.02.26

At the outset of the seminar session, Dr. Kalpataru Nanda, Assistant Professor, Department of Genetics and Plant Breeding, welcomed the faculty members and participants. He then invited **Dr. Swagatika Sahoo, Assistant Professor (Entomology),** School of Agriculture, GIET University, Gunupur, to deliver her seminar presentation on the topic "**Emerging Technologies and Innovations in Pest Management".**

The speaker began by emphasizing the growing need for advanced technologies in pest management due to increasing pest resistance to conventional insecticides and Bt toxins, along with rising environmental concerns. She introduced RNA interference (RNAi) as a modern molecular approach for species-specific gene silencing, which down-regulates the expression of target genes using double-stranded RNA (dsRNA). The advantages of RNAi, including high specificity, reduced resistance risk, environmental safety, and compatibility with nanotechnology and biocontrol approaches, were highlighted. Different methods of RNAi delivery such as host-induced gene silencing (HIGS), spray-induced gene silencing (SIGS), microinjection, and root uptake were explained. A case study on gene silencing in *Helicoverpa armigera* targeting genes such as acetylcholinesterase, ecdysone receptor, and v-ATPase-A was also discussed.

Dr. Sahoo further elaborated on the role of nanotechnology in pest management, particularly nano-formulated insecticides or nanopesticides. She explained that nanocarriers improve pesticide stability, reduce dosage requirements, enhance penetration into insect cuticles, and minimize environmental contamination. The use of chitosan-mediated nanoparticles for efficient dsRNA delivery and effective gene knockdown in pests was highlighted. She also covered the application of semiochemicals in behavioral pest management, including pheromones and allelochemicals used for mating disruption, monitoring, and pest suppression. Modern innovations such as smart pheromone-based monitoring systems, microencapsulated pheromone sprays, and SPLAT technology for bollworm management were discussed. In addition, the role of insect phenology models and forecasting systems in predicting pest outbreaks and improving decision-making in integrated pest management was also explained.

Overall, the seminar provided valuable insights into modern, eco-friendly pest management technologies. The presentation was informative and well received by the audience. An interactive discussion followed, after which Dr. Kalpataru Nanda proposed the vote of thanks and the seminar concluded successfully.

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