

# The Evolution of Safer and Smartest Pesticide Formulation and Delivery System

**Mr. Rahul Vijay Kashikar, Satish D. Dukre, Dr. Avinash .S. Jiddewar, Bibi Maryam Naseer Khan**  
NSPM College of Pharmacy, Darwha, Yavatmal

**Abstract:** This overview explores the major technological shift in the agrochemical industry, moving from simple, harsh chemicals to advanced, high-tech formulations. It explains that a pesticide is not just a 'killer ingredient' but a complex recipe that includes stabilizers and carriers to make the product usable and effective.

The industry is currently replacing old, dusty powders and toxic, solvent-based sprays with safer alternatives. These modern solutions focus on water-based liquids (like Suspension Concentrates) and dust-free granules that are safer for farmers to handle and friendlier to the environment.

Furthermore, the text highlights the future of crop protection, which relies on nanotechnology (making particles ultra-small for better absorption) and controlled-release systems (microscopic shells that release the chemical slowly over time). Combined with precision tools like drones and seed coatings, these advancements allow farmers to use lower doses of chemicals while achieving better pest control and minimizing environmental impact.

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