

# Nano-Carriers: An Emerging Functional Tool for Micronutrients Delivery in Plants

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**Abstract**—Presently, the requirement of food is needed in high quantity with continual increasing population, thereby has necessitated a search for effective agricultural technologies that would enhance productivity of crops along with minimal environmental risks. The application of nano-materials or nano-carriers in the form of nano-pesticides, nano-fertilisers, and nano-sensors has shown good impact, enhancing the crop productivity per unit area and therefore has emerged as the most demanding area of research nowadays. The nano-carriers effectively enhance the micro-nutrients, fertilisers, and agrochemicals delivery within the plants. Also, nano-carriers have potential ability to protect plants against pathogens through numerous mechanisms mainly reactive oxygen species (ROS). The nano-carriers have ability to replace conventional pesticides, chemical fertilisers, besides reducing environmental hazards. With this backdrop in the present review, an attempt has been made to use carbon in particular and polymer-based nano-carriers and their application in micronutrients and pesticides delivery system.

**Keywords:** Nano-carriers, agriculture, nanotechnology, micronutrients, delivery system.