

Article title	Chitosan nanomaterials: A prelim of next-generation fertilizers; existing and future prospects
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Abstract	<p>Global agriculture is urgently seeking ways to mitigate the detrimental effects of conventional <u>chemical fertilizers</u> on the environment. Biodegradable, eco-friendly, renewable energy-sourced next-generation fertilizers could be an answer, allowing for improved nutrient use efficiency and a lower environmental footprint. During the last decade, agricultural research on chitosan <u>nanomaterials</u> (NMs) has expanded, demonstrating their usefulness in enhancing agricultural output not only as plant immune boosters but also via slow, controlled and target delivery of nutrients to plants. Chitosan NMs natively act as an abundant nutrient source of C (54.4–47.9 wt%), O (42.3–30.19 wt%), N (7.6–5.8 wt%), and P (6.1–3.4 wt%) to plants. Moreover, chitosan NMs can further functionalized by more nutrients payloads through its functional groups. The current review investigates the technical features of chitosan NMs as prospective next-generation fertilizers based on rationales. The review offers crucial insights into future directions, sources, production capacity of chitosan-based next-generation nanofertilizers for industrial-scale manufacturing.</p>
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