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Nano DAP Fertilizer

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Abstract
Nano DAP (Diammonium Phosphate) fertilizers, despite their small size, pack a powerful punch in the world of agriculture. This article investigates the transformational potential of Nano DAP in crop productivity. We clarify the relevance of Nano DAP in sustainable agriculture by exploring its subtleties, special benefits, and impressive real-world effects. The difficulties and legal implications of this invention must be taken into account, though. A sustainable way forward for feeding a growing global population while protecting our environment as we explore the world of Nano DAP fertilizers.

Keywords: Nano DAP (Diammonium Phosphate) fertilizers; Sustainable agriculture; Crop productivity; Environmental protection.

Introduction
Innovation is a recurring theme in the agricultural industry. Fertilizers made with nano DAP (Diammonium Phosphate) are a new development that have had a significant influence. Traditional Diammonium Phosphate fertiliser is shrunk to a scale that is undetectable to the human eye and suspended in a liquid carrier by these nanoscale particles, making it incredibly simple to apply. Despite being tiny, these particles are revolutionising contemporary farming. The importance of Nano DAP fertilisers in agriculture is examined in this article. We'll discuss their distinctive qualities, such as enhanced fertiliser delivery, environmental friendliness, precise application, and crop resilience. The difficulties with Nano DAP will also be covered, with a focus on the necessity of ethical production, distribution, and farmer education. Nano DAP fertilisers give promise in a future where sustainable agriculture is an urgent requirement. They have the fascinating and useful potential to improve agricultural production while protecting the environment.

The Incredible Benefits of Nano DAP
1. Delivering Super-Powered Nutrients: The ultrafine particles of Nano DAP have a large surface area. This translates into improved development and higher yields for plants since they can absorb nutrients more effectively.
2. Eco-Friendly: Traditional fertilisers can wash away into surrounding rivers or the groundwater, producing environmental issues. Nano DAP greatly lowers these dangers, making it a more environmentally friendly option for farmers.
3. Cost-Effective: Despite its high-tech appearance, Nano DAP can really save farmers money. Higher yields and reduced fertiliser waste can increase earnings in the long term.
4. Sustainable Agriculture: Nano DAP is an excellent fit for the idea of sustainable agriculture. It eliminates the demand for chemical fertilisers and promotes prudent nutrient management.

Nano DAP fertilizers

Recently IFFCO (Indian farmers fertilizer cooperation) and Coromandel fertilizers developed Nano DAP fertilizer using nanotechnology.

IFFCO Nano DAP [1]

IFFCO Nano DAP is an effective supply of accessible nitrogen (N) and phosphorus (P_20_5) for all crops, assisting in the correction of nitrogen and phosphorus shortages in standing crops. Nitrogen (8.0 percent N w/v) and Phosphorus (16.0 percent P_20_5w/v) are both included in the nano DAP formulation. Due to its smaller than 100 nanometer-sized particles, Nano DAP (Liquid) has an edge in terms of surface area to volume (nm). It may easily access the seed surface, stomata, and other plant openings because to its special characteristic. Nano nitrogen and phosphorus clusters in Nano DAP are functionalized with biopolymers and other excipients. Higher seed vigour, greater chlorophyll, photosynthetic efficiency, better quality, and increased crop yields result from Nano DAP's improved spread ability and assimilation within the plant system.

Fig 1. IFFCO Nano DAP

Table 1: IFFCO Nano DAP application methods

Method of Application	Application Rate	Water Quantity (per acre)
Foliar Spray	2-4 ml per liter of water	At good foliage stage (Tillering /Branching) and 2nd spray at Pre-Flowering / Late Tillering stage
1. Knapsack Sprayers 2. Boom /Power Sprayers 3. Drones	2-3 caps (50-75 ml) per 15-16 liter tank	8-10 tanks normally cover 1 acre crop area
	3-4 caps (75-100 ml) per 20-25 liter tank	4-6 tanks normally cover 1 acre crop area
	250-500 ml per tank of 10-20 liter volume	To cover 1 acre area
Seed Treatment	3-5 ml per Kg of seeds	-
Root / Tuber / Sett Treatment	3-5 ml per litre of water	-

Table 2: Price and other Specifications of IFFCO Nano DAP

Brand:	IFFCO
Product Volume (per bottle)	500 ml
Total Nitrogen (per bottle)	8% N w/v
Total Phosphorous (per bottle)	16% P2O5 w/v
Price (per bottle)	₹ 600/-
Manufacturer	IFFCO
Country of Origin	India
Sold by	IFFCO eBazar. Ltd.

Coromandel Nano DAP [2]

Nano DAP is a premium inhouse invented and manufactured product based on cutting-edge Nanotechnology. It is a distinctive liquid fertiliser solution that includes diammonium phosphate nanoparticles (DAP). It provides sources of nitrogen and phosphorus, two important fundamental nutrients needed for crop growth and development. Plant leaves easily

absorb Nano DAP due to its tiny size (100 nm) and large surface area. The improved crop growth and production, less environmental load, and greater farmer profitability are all benefits of this innovative nano-formulation.

Fig 2. Coromandel Nano DAP

Features:

- Nano DAP is a foliar opalescent white aqueous Nano fertiliser.
- It has DAP nanoparticles with N-2 % (w/v) and P_2O_5-5 % (w/v).
- Because of its tiny size and large surface area, it can use nutrients more effectively.
- DAP in nano form is best for systemic absorption.
- It includes the best stabilisers for product efficiency and stability.

Table 3. Coromandel Nano DAP volume and dosage

Pack Size	Dosage per Acre	Number of Sprays
1 litre	500 ml	Two sprays
		(1) Vegetative state (4-5 weeks after crop sown/transplant)
		(2) Before flowering stage of the crop

Challenges and Future Considerations

While Nano DAP is promising, it comes with challenges that require ensuring the production and distribution of these nanofertilizers meet safety and environmental standards, alongside providing farmers with proper education to harness these tiny wonders effectively.

Conclusion

Nano DAP fertilizers are pioneering a new era of sustainable crop production. With their ability to enhance nutrient absorption, reduce environmental impact, and fortify crops against adversity, Nano DAP fertilizers hold the promise of a brighter future for agriculture. As we continue to innovate in this field, these tiny particles may indeed be the key to simultaneously nourishing our global population and preserving our planet for generations to come. Collaboration among farmers, researchers, and policymakers is essential to unlock the full potential of Nano DAP fertilizers and usher in a new era of agricultural sustainability.

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