



IFFCO NANO UREA

NANO-TECHNOLOGY
BASED REVOLUTIONARY
AGRI-INPUT

Indian Farmers Fertiliser Cooperative Limited
IFFCO Sadan, C-1, District Centre,
Saket, New Delhi -110017

(Recording and/or screenshot of the VC is prohibited)

NITROGENOUS FERTILISER SCENARIO

1

Urea accounts for > 82% of the nitrogenous fertilizers applied to crops

2

Globally, 188 million MT of Urea is applied to crops every year.

3

NPK ratio is skewed and distorted due to overuse of fertilizers.

4

Low use efficiency of Urea (30-40 %) –
Compromises health of Soil-Air-Water

- Excess use of Urea causes environmental issues & results in susceptibility of crops to Insects, Pests & Diseases
- Excessive foliage growth leads to crop lodging
- It leads to deterioration of soil health due to mining of micronutrients

**INJUDICIOUS
APPLICATION OF
UREA AFFECTS**

Food

Fodder

Feed & Fibre

POLLUTION DUE TO EXCESSIVE USE OF UREA

1 Kg of NO_x emission is equivalent to 298 Kg of Carbon dioxide

Part of Urea gets converted in NO_x and emitted to atmosphere

Use of N-fertilizers causes NO_x emissions



NANO UREA BENEFITS

Nano Urea will help in eliminating NO_x and Ammonia emissions

Potential to help in meeting the UN Sustainable Goals and help in achieving the objectives of Paris Climate Agreement of limiting Global Warming below 2 Deg C

POLLUTION DUE TO EXCESSIVE USE OF UREA

Runoff to rivers, lakes and oceans causing excessive algae growth

Excessive algae impacts fish and aquatic life due to oxygen depletion

Excess Nitrates leaching to Ground/ Drinking water

Excessive Nitrates in Drinking Water harmful for human health

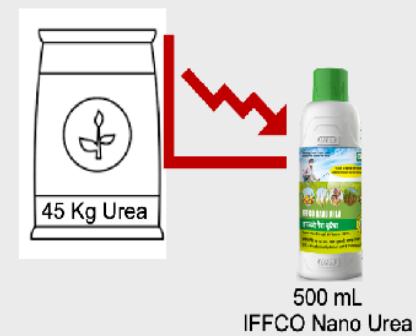


Nano Urea will help in improving the soil health, improving aquatic life, reduce nitrate leaching losses and improve ground water quality

IFFCO - Nano Biotechnology Research Centre (NBRC)



NANO UREA FOR SUSTAINABLE AND PRECISION AGRICULTURE



REQUIRE LESS
Reduces use of Conventional Urea

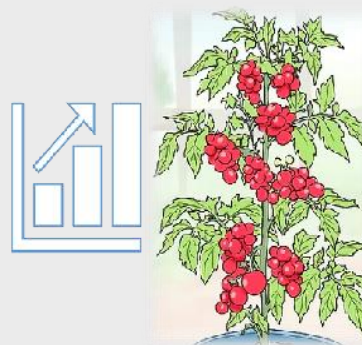


NON TOXIC



BIO/ECO - SAFE
Improves Soil Health

- Evaluated by the ICAR and DST approved labs.
- Tested as per OECD and DBT- Govt of India guidelines for Nano Agri Inputs-2020



PRODUCE MORE
Improves Crop Productivity



ECONOMICALLY AFFORDABLE

IFFCO NANO UREA

- Nano-technology based revolutionary agri-input, provide nitrogen fertilizer to plants.
- Easy to use! Mix with water and spray on plant leaves.
- Tested on over 11000 farm fields on 94 crops and 20+ agricultural research institutes/universities on 43 crops.
- Approved by Govt. of India.
- Compliance with national (India) and international safety/toxicity guideline to test nanomaterials.
- Promote sustainable and precision in agriculture.

DEVELOPMENT OF NANO FERTILIZERS: Testing & Validation

Efficacy trials by the research institutes and universities affiliated with ICAR

1

Validation studies for nanoscale characterization, stability and safety (biosafety – toxicity) fulfils the Department of Biotechnology (DBT) guideline-2020 for the

2

evaluation of on Nano Agri Input Products (NAIPs) and International OECD Testing Guidelines (TGs)

3

Products were evaluated by the NABL accredited, GLP certified and DST approved laboratories of Bioscience Research Foundation (BRF), Chennai and Department of Nano Science & Technology (NST) of Tamil Nadu Agricultural University (TNAU),

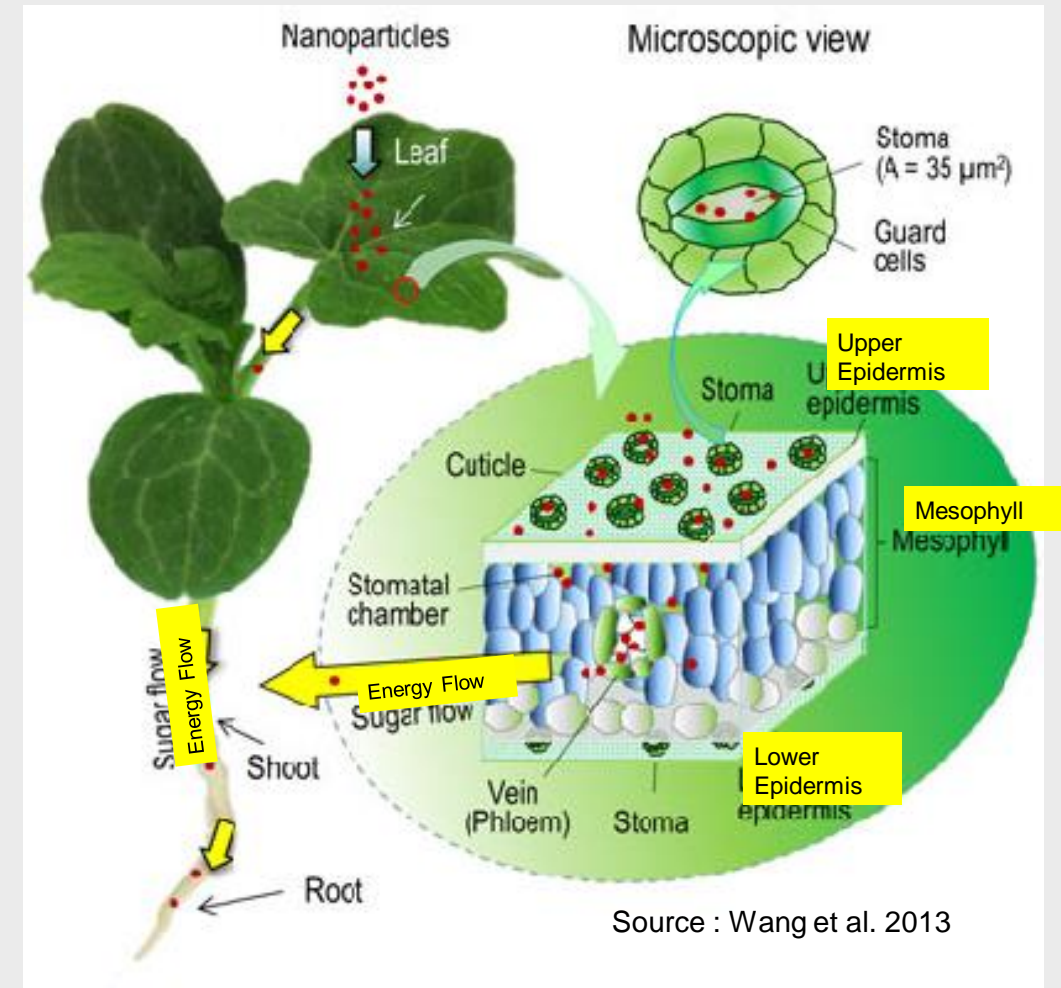
Coimbatore

NANOSCALE ADVANTAGE IN UPTAKE - DYNAMICS OF SIZE, SHAPE AND MODE OF ACTION

Nano Urea is applied @ 500 ml/acre at initial growth stage and before flowering

- When sprayed on leaves initially it gets absorbed easily and also enters through stomata and other pores
- It is translocated & metabolically assimilated as proteins, amino acids etc. as per the plant's need

Nano Urea is a viable alternative to wean the farmers away from Urea.



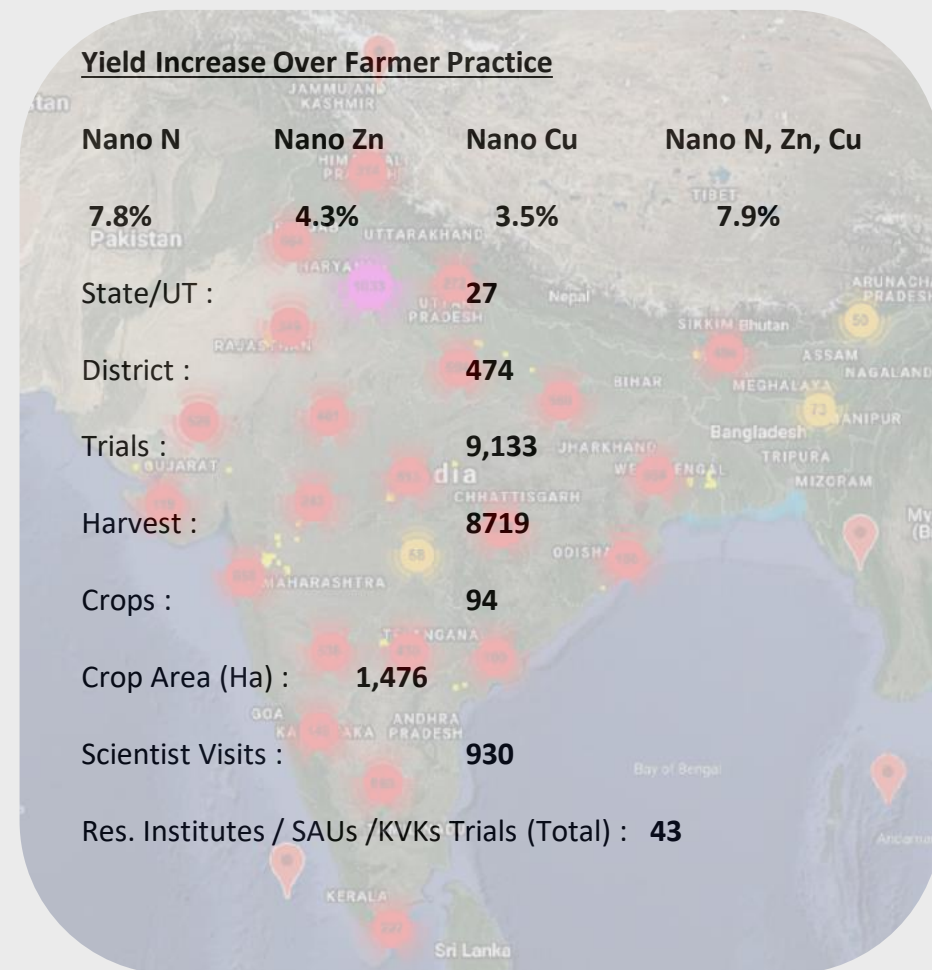
NANO UREA – DELIVERED TO PLANTS BY FOLIAR SPRAY

Spray by **Drones** and **Backpack Sprayers**



Multi location- Multi Crop - Farmer Field Trials (FFT's)

Sr. No.	STATE / UT's	State wise No. of Trials (Rabi 2019-20)	STATE / UT's	State wise No. of Trials (Rabi 2019-20)
1	ANDAMAN AND NICOBAR ISLANDS	4	MANIPUR	3
2	ANDHRA PRADESH	170	MEGHALAYA	2
3	ASSAM	111	MIZORAM	3
4	BIHAR	423	NAGALAND	5
5	CHHATTISGARH	96	ODISHA	318
6	GUJARAT	619	PUNJAB	660
7	HARYANA	594	RAJASTHAN	900
8	HIMACHAL PRADESH	119	TAMIL NADU	503
9	JAMMU AND KASHMIR	24	TELANGANA	386
10	JHARKHAND	96	TRIPURA	4
11	KARNATAKA	158	UTTAR PRADESH	1459
12	KERALA	30	UTTARAKHAND	80
13	MADHYA PRADESH	679	WEST BENGAL	725
14	MAHARASHTRA	548		
Total / Average				8719



<https://iffconano.in/analytics>

Multi location- Multi Crop 'On Station' and 'On Farm' Efficacy Trials of Nano Fertilizers



Research Institute / University	Crop	Results
ICAR - Indian Agricultural Research Institute, New Delhi	Wheat, Mustard	Results indicate that 25 -50 % nitrogen fertilizer reduction in wheat and mustard is possible with 2 sprays of Nano Nitrogen.
ICAR – Indian Institute of Horticultural Research, Bengaluru, Karnataka	Tomato Cabbage Cucumber	Application of Nano N (two spray) can reduce the use of urea consumption by 50%. Nano nutrients increase plant growth and developments, moreover improves agronomic properties.
Anand Agricultural University (AAU), Gujarat	Wheat	Foliar application of nano N, nano Zn and Nano Cu significantly increased yield attributing characters of wheat. Application of nano fertilizer did not change the soil properties after harvest of the crop. Application of nano N can reduce the use of urea consumption by 50%. Combination of nano N, Zn and Cu shows synergistic impacts on plant growth and development.

Multi location- Multi Crop - Farmer Field Trials (FFT's) of Nano Fertilizers

Location	Crop	Treatment	Mean Yield (Kg/ha)	% Increase (Overall)	Net Return (Rs / ha)
Uttar Pradesh	Wheat (431 Nos.)	FFP@	4354		
		FFP (- 50 % N) + 2 Nano N Sprays	4779	9.76	8,182
	Mustard (44 Nos.)	FFP	1708		
		FFP (- 50 % N) + 2 Nano N Sprays	1837	7.55	5,724
	Potato (187 Nos.)	FFP	32,298		
		FFP (- 50 % N) + 2 Nano N Sprays	35,414	9.65	31,165

@ Farmer Fertilizer Practice (FFP)



Some Glimpses of IFFCO Nano Fertilizers Tested Across India

Location	Crop (Rabi 2019-20)	Organic Farming Area	Average Increase in Nano N plots over control
Khaliyawas, Rewari (Haryana)	Mustard & Wheat	50 Acres	11.8 %

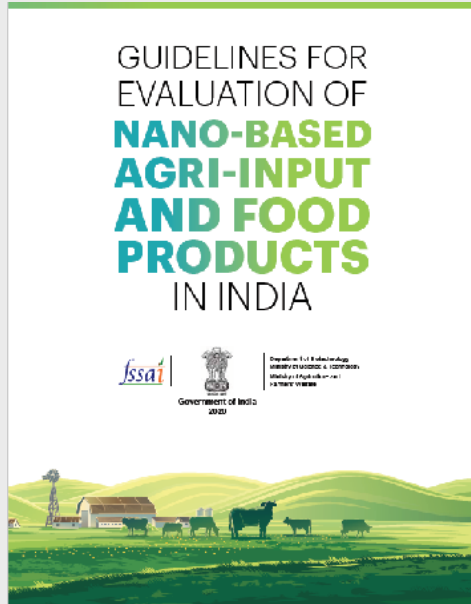
Results : More number of tillers & branches over control. More number of Siliqua / plant and number of grains per siliqua. Average 2.55 quintal incremental higher yield in Nano N and combination of Nano N + Nano Zn + Nano Cu plots



NANO UREA ENHANCES NUTRITIONAL STATUS OF CROP PRODUCE

- Harvested grains of Nano Urea treated plots of wheat and chickpea crops recorded increase in nutritional content (Protein, Carbohydrate, Oil, Fiber) and mineral content (N, P, K, S, Zn, Cu, Fe).
- In Apple cultivar. Red Delicious variety in Kashmir Valley - Fruit quality (Colour, Firmness, Soluble sugar content) and nutrient content (N, P, K, Ca, Mg and S) improved with the application of Nano Urea.

IFFCO Nano Fertilizers are Environment Friendly, Safe for User & Crops



IFFCO Nano Nitrogen, Nano Zinc and Nano Copper have been evaluated and validated according to the , “**Guidelines for Evaluation of Nano based Agri Input and Food Products in India**” released by the Department of Biotechnology (DBT), Govt. of India.



Food toxicity and safety studies of harvested produce by NABL-GLP certified labs have also confirmed that IFFCO Nano fertilizers are safe and effectively assimilated inside the plant system with no toxic effect at recommended levels.

IFFCO Nano Fertilizers

IFFCO Nano Urea is approved by FCO, Govt. Of India as a Nano fertilizer

It is cost effective & compatible with most of the agrochemicals, bio-stimulants and speciality fertilisers for application to crops.

Foliar application of nano fertilizers calls into focus efficient spray technologies with agritech solutions such as drone, improved sprayers etc. for better farming application practices.

Nano fertilizers are 'Informed Choice' available to farmers to address the limitations faced by today's agriculture.



Nano fertilizers will lead to self-reliance and help in meeting the Sustainable Development Goals (SDGs) with reduced environmental footprints

Thank You

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