

Nanourea- Importance and Uses

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Introduction

Nano urea is a type of fertilizer. It is extracted from the plant, animal and manufactured by the mechanical, physical, chemical processes. It is source of Nitrogen. The Nitrogen is included in major nutrient category. Nitrogen is important for proper vegetative growth of plant and they enhance the all growth, quality and parameters. It is constituent of amino acids, cellular material, nucleotides, proteins, chemicals and gives the gigantic edge of flowers. The Nitrogen deficiency affect the plant growth, plant height, protein synthesis, blossoming, seed standardization, photosynthetic activity. Firstly the urea present in pellets or granule form and farmer use more than recommended doses. Present scenario of farmer use more urea and as per government legislations make the 45 kg bag. Then, IFFCO (Indian Farmers Fertilizers Cooperative Limited)- Nano biotechnology research centre (NBRC), Gujarat release the first time in world developed nano urea in liquid form to avoid the imbalance and excessive use of fertilizers. The nano means small and size between 1-100 nm but size of nano urea between 20-50 nm. The absorption is more than other urea by foliar recommendation.





They directly enter through the vascular bundles and it contains 4 % of total nitrogen. When this urea sprayed on foliage of plants at critical stages, enter through the stomata and more nitrogen use efficiency than other pellet form urea. The volume of this product is 500 ml and price of nano urea is 240/bottle, this is 10 % less than conventional urea.

Use

The two foliar sprayed is best for plant growth. 2-4 ml of urea dissolve in one litre of water and sprayed on foliar of plants at 30-35 days after sowing or transplanting and second sprayed at flowering stage. Number of sprays increased or decreased according to crop requirement. It is non-toxic but safely use at time of spraying. The spraying done at morning or evening time avoids dew. The cut nozzles and flat fan nozzles used at spraying on foliage.

Importance

- More crop yield
 - Higher the income of farmers
 - Less use of chemical fertilizers
 - Best food quality
 - Helpful to ecology and balance environment
 - Easy to keep and transfer
- **More crop yield:** At time of field trials on nanourea they recorded the 8% yield more than use of conventional urea. Because they directly spray on foliage and higher the chlorophyll content increase the tillers/plant, seed yield and other quality, yield parameters. During 2019-2020 conducted 11000 field trials on this study.
- **Higher farmer income:** The farmer income increase 2000-4000 on basis of field trials. Because farmer use less input as compare to conventional urea and higher the crop productivity because quality is better.
- **Less use of chemical fertilizers:** The one bottle of nanourea has ability to replace the one bag of traditional urea due to increase the nitrogen use efficiency.
- **Best food quality:** The nanourea crops are completely safe to eat or human, animal consumption. The quality of harvested produce is superior, in terms of protein and other nutritional supplements.

- **Helpful to ecology and balance the environment:** The conventional urea directly broadcasted by the farmer and more leaching, runoff loses, volatilization and they directly effects on soil microorganisms, but use of nano urea they reduce the all loses. So, they balanced the environment and resource or energy affable. It is completely safe for birds, human, biosphere community used at recommended levels, has been tested by guidelines of department of biotechnology.
- **Easy to keep and transfer:** Farmers can simply or easy transport the nanourea bottles than large urea bags at time of 45 kg. In terms of comparable transportation and warehousing cost nanourea has considerable influence.



Difference Between Nanourea And Conventional Urea

Particulars	Nanourea	Conventional urea
Form	Liquid	Solid
Discovered	Released by first time in	Developed by the German chemist

	2021 by IFFCO under nanotechnology of NBRC, Gujarat.	Friedrich in 1828.
Method of application	Spraying on foliage	Broadcasting
Quantity	500ml/bottle	45 kg/bag
Price	240	270
Effectiveness	80%	30-40%
Nitrogen use efficiency	More	Less
Loses	Less	More
Action	Immediately	Slowly
Absorption	Directly absorb through stomata of plant by vascular bundles	Absorb through root hairs or soil micro-organism
Transportation and easy store	Easy	Difficult
Productivity	Increased by 8%	Increased by 4-5%
Environment friendly	More	Less
Nitrogen content	4% w/v	46%
Improve	More soil health	Less
Leaching, Volatilization, Denitrification	Less	More
Pollution	Less	More
Toxicity	Less	More

Image



Conclusion

It may be concluded that the nanourea is best than conventional urea and they are environment friendly, less input use, increase the yield and farmer income.