

Nano Urea

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INTRODUCTION

Nano Urea is a nanotechnology based revolutionary Agri-input which provides nitrogen to plants. When compared to conventional urea prill, it has a desirable particle size of about 20-50 nm and more surface area (10,000 times over 1 mm urea prill) and number of particles (55,000 nitrogen particles over 1 mm urea prill).

“Urea that is produced from nano-technology to improve the efficiency of the nutrients of the crops is called as nano urea.”

“The nano urea liquid will replace conventional urea and it can curtail its requirement by at least 50 percent.”

“Nano Urea liquid is a nanotechnology-based fertilizer that enhances the growth of crops by replenishing their nitrogen requirements.”

“Nano urea’, a product that uses organic polymers, is being touted as a substitute for granular urea used as a fertiliser, which is currently being sold to farmers with a heavy subsidy.”

“The Indian government and its inventor have said ‘nano urea’ will reduce India’s import bill also also improve crop yield. It has been approved for sale.”

“But some scientists are sceptical of ‘nano urea’: they say the claimed benefits need to be tested more before it is commercially sold to farmers.”



Advantages of nano urea fertilizer

It is easily distributed through the phloem from source to sink inside the plant as per its need. Unutilized nitrogen is stored in the plant vacuole and is slowly released for proper growth and development of the plant. Small size (20-50 nm) of Nano Urea increases its availability to crop by more than 80%.

Nano Urea is cost-effective and required in low quantities. The most critical benefit of using Nano Urea for agriculture is its minimal impact on the environment. This will result in reducing the release of greenhouse gasses and improve the quality of air and water.

Nano fertilizers offer benefits in nutrition management through their strong potential to increase nutrient use efficiency. Nutrients, either applied alone or in combination, are bound to nano-dimensional adsorbents, which release nutrients very slowly as compared to conventional fertilizers. While liquid nano urea up to 85% efficient, its conventional counterpart is only about 25% efficient. This higher effectiveness is mostly due to nanotechnology, which makes it possible to design extremely small particles with greater surface-to-mass ratios, which aids in the regulated delivery of crop nutrients.

Its application to crops as foliar fertilization enhances crop productivity to the tune of 8% with commensurate benefits in terms of better soil, air and water, and farmers profitability.

The main function of Urea fertilizer is to provide the plants with nitrogen to promote green leafy growth and make the plants look lush. Urea also aids the photosynthesis process of plants. Since urea fertilizer can provide only nitrogen and not phosphorus or potassium, it's primarily used for bloom growth.

High nutrient content- The content of available nitrogen is high, 1 kg urea is about 2 kg ammonium sulfate;

Easy to store The moisture absorption of urea is smaller than that of ammonium sulfate, so it is convenient to use and preserve, and it is not easy to deteriorate.

Rich raw materials Chemical fertilizers are produced with natural mineral resources as raw materials, such as oil, natural gas, coal, phosphate rock and so on. These raw materials are rich and can be exploited in large quantities.

Disadvantages of nano urea

- The biggest disadvantage is the potential for volatilization.
- This occurs when urea is surface-applied and converted to ammonium carbonate by urease.
- Lack of a nano-fertilizer risk management system.
- Lack of production and availability of nano fertilizers in required quantities.
- The high cost of nano fertilizers.
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Urea should not be spread on the ground.

Urea can be used only after 4-5 days of transformation at normal temperature. Most of the nitrogen is easily volatilized in the process of ammoniation. Generally, the actual utilization rate is only about 30%. If urea is applied in alkaline soil and soil with high organic matter content, the loss of nitrogen will be faster and more. Moreover, urea is easy to be consumed by weeds.

Too much urea is easy to cause fertilizer damage.

Urea has high nitrogen content and should not be applied too much to avoid unnecessary waste and fertilizer damage. Many farmers in fruit producing areas use a lot of urea,

resulting in tree death, with very serious consequences.

It takes a long time to come into effect and urea needs to be used in advance.

When urea is used as top dressing, we should pay attention to its decomposition process in the soil. Generally, about 7 days after urea application, it needs to be converted into

ammonia nitrogen to produce fertilizer effect. Under alkaline conditions, most of the nitrogen will turn into ammonia gas and volatilize. Therefore, urea cannot be mixed with or applied at the same time with lime, plant ash, calcium magnesium phosphate and other basic fertilizers.