



## Urea Gold

**For Prelims:** Urea Gold, [Neem Coated Urea](#), [Liquid Nano Urea](#), [Leguminous crops](#), [Nitrogen-phosphorus-potassium \(NPK\)](#), Nitrogen use efficiency.

**For Mains:** Features of Urea Gold, Status of Urea Consumption in India.

[Source: IE](#)

### Why in News?

Recently, Indian Prime Minister officially launched '**Urea Gold**' fertiliser'. It is developed by **Rashtriya Chemicals and Fertilizers Ltd (RCF)**, a leading fertilizer and chemical manufacturing company in India in the Public Sector.

### What is Urea Gold?

- **About:** Urea Gold is created by **infusing urea with sulfur**, creating a composite fertilizer with **37% nitrogen (N) and 17% sulfur (S)**.
  - This nutrient blend serves two primary objectives: **fulfilling sulfur requirements in Indian soils and enhancing nitrogen use efficiency (NUE)**.

**Note:** Normal [urea](#) contains 46% of a single plant nutrient: Nitrogen or N.

- **Features:**
  - **Addressing Soil Deficiencies: Indian soils frequently lack sulfur**, an essential element particularly crucial for oilseeds and pulses.
    - By incorporating sulfur into the fertilizer composition, '**Urea Gold**' aims to **provide a comprehensive nutrient package**, thus catering to the specific needs of crops reliant on sulfur.
  - **Enhancing Nitrogen Efficiency:** A key innovation of 'Urea Gold' is its ability to **improve nitrogen use efficiency (NUE)**.
    - The sulfur coating on urea enables a gradual release of nitrogen, leading to **prolonged nutrient availability**.
    - As a result, **plants maintain their greenness for an extended duration**. This phenomenon allows farmers to reduce the frequency of usage.
      - Farmers tend to apply urea when **they notice the leaves turning yellowish**.
  - **Potential Yield Increase:** 'Urea Gold' has the potential to increase crop yields through improved nutrient utilization.
    - The **gradual release of nutrients minimizes wastage and enhances the nutrient uptake by plants**, ultimately translating into enhanced productivity.

### What is the Status of Urea Consumption in India?

- **About Urea:**
  - Urea is a **white crystalline compound** commonly used as a [synthetic fertilizers](#) in agriculture.
  - When applied to the soil or crops, **urea is broken down by enzymes into ammonia and carbon dioxide.**
    - The **ammonia then gets converted into ammonium ions**, which can be **taken up by plant roots and used for growth and development.**
- **Status of Consumption in India:**
  - Urea is India's most widely used fertiliser, with its consumption/sales rising from **26.7 million tonnes (mt) to 35.7 mt between 2009-10 and 2022-23.**
- **Interventions Similar to Urea Gold:**
  - [Neem Coated Urea](#): This is a modified form of urea that is **coated with neem oil.**
    - It **reduces the leaching and volatilization losses of nitrogen**, has insecticidal and nematicidal properties, and improves the soil texture and water holding capacity.
  - [Liquid Nano Urea](#): This is a **nanotechnology-based fertilizer that is sprayed on leaves** and is assimilated by the plant cells.
    - It **enhances the nutritional quality and productivity of the crop**, reduces the fertilizer consumption, improves the nitrogen use efficiency, and saves the input costs.
- **Challenges:**
  - **Urea Imports and Feedstock Dependency:** In 2022-23, **7.6 million metric tons (mt) of urea were imported out of a total of 35.7 mt sold**, raising significant apprehensions.
    - Even **domestically produced urea heavily relies on imported natural gas**, the essential feedstock for production.
  - **Nitrogen Use Efficiency (NUE) and Loss:** Around **65% of applied N is lost to various factors: ammonia gas release into the atmosphere** and nitrate leaching underground after conversion.
    - The decline in NUE has led to a **situation where farmers need to apply increasingly more fertilizer** to achieve the same crop yield.
  - **Subsidy Burden:** Urea is heavily subsidized by the Indian government to ensure affordable prices for farmers.
    - However, this **subsidy has led to issues of overuse and inefficiencies in urea consumption.**
    - Farmers often apply more urea than necessary due to its low cost, which can result in imbalanced nutrient application and environmental degradation.

## Way Forward

- **Fortifications:** Fortification of urea, DAP (Di-ammonium Phosphate) and other commodity fertilisers with micronutrients is the **way forward for boosting crop yields and maximising the use efficiency of imported nutrients .**
  - Since India has limited natural gas, rock phosphate, potash, and sulfur reserves, these fertilizers should be coated with **secondary nutrients (calcium and magnesium) and micronutrients (zinc, boron, manganese, molybdenum, iron, copper and nickel) instead.**
- **Precision Agriculture:** Implementing [precision agriculture](#) techniques, such as **variable rate application**, can help optimize urea use by **tailoring fertilizer application rates based on specific crop and soil needs.**
  - This prevents overuse and reduces nutrient wastage.
- **Nutrient Management Planning:** Encouraging farmers to adopt comprehensive nutrient management plans can ensure balanced fertilizer application, considering the [nitrogen-phosphorus-potassium \(NPK\) needs of crops.](#)
  - This approach minimizes the overreliance on urea and promotes the efficient use of other nutrients with **optimum balance (N: P: K= 4:2:1).**
- **Crop Rotation and Diversification:** Promoting diverse cropping patterns and crop rotation can **reduce the excessive demand for urea.**

- [Leguminous crops](#), for instance, can fix atmospheric nitrogen, reducing the need for nitrogen fertilizers.
- **Subsidy Reform:** There is a need to **gradually rationalise and reform the fertilizer subsidy system** to incentivize the use of balanced fertilization practices.
  - This might involve **providing subsidies for alternative nutrient sources**, encouraging farmers to reduce urea consumption.

### UPSC Civil Services Examination, Previous Year's Question (PYQs)

**Q. With reference to chemical fertilizers in India, consider the following statements: (2020)**

1. At present, the retail price of chemical fertilizers is market-driven and not administered by the Government.
2. Ammonia, which is an input of urea, is produced from natural gas.
3. Sulphur, which is a raw material for phosphoric acid fertilizer, is a by-product of oil refineries.

**Which of the statements given above is/are correct?**

- (a) 1 only
- (b) 2 and 3 only
- (c) 2 only
- (d) 1, 2 and 3

**Ans: (b)**

**Q. Why does the Government of India promote the use of 'Neem-coated Urea' in agriculture? (2016)**

- (a) Release of Neem oil in the soil increases nitrogen fixation by the soil microorganisms.
- (b) Neem coating slows down the rate of dissolution of urea in the soil.
- (c) Nitrous oxide, which is a greenhouse gas, is not at all released into atmosphere by crop fields.
- (d) It is a combination of a weedicide and a fertilizer for particular crops.

**Ans: (b)**