

Nitrogen Use Efficiency

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About Nitrogen Use Efficiency:

- It is a term that is used to describe the **efficiency of a plant** in using applied or fixed nitrogen for biomass production.
- It is further defined as the **ratio between crop yield and the amount of nitrogen absorbed** from the soil through roots or from the atmosphere through fixation by bacteria.
- NUE is an important trait in crop breeding programs, which aims to improve crop yield while reducing input costs, such as fertilizers, and at the same time keeping nitrogen out of the environment.
- **Issues with Traditional methods**
 - It is used to enhance NUE which often involve the application of inorganic nitrogen fertilizers. These practices, while effective, come with significant drawbacks.
 - They can lead to **increased operational costs** for farmers and contribute to environmental issues, such as the emission of nitrogen oxides (NO_x) during fertilizer production. Excessive use of these fertilizers also contributes to global greenhouse gas emissions.

Highlights of the study

- The recent study highlights a novel approach to improving NUE by focusing on the **systemic regulation of Nitrogen Oxide (NO) levels in plants.**
- By modulating these levels, researchers can influence the activity of **high-affinity nitrate transporters (HATs)**, which play a vital role in nitrogen uptake.
- This method diverges from traditional practices, offering a more sustainable solution to enhance crop yields while reducing nitrogen inputs. As the world faces challenges related to food security, this research provides a promising pathway for developing more efficient agricultural practices.

Significance of Nitric oxide (NO)

- It plays a pivotal role in regulating **various physiological processes in plants.**
 - It is involved in the activation of **high-affinity nitrate transporters**, which are crucial for nitrogen uptake, especially under **low nitrogen conditions.**
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Q1. What is Liquid Nitrogen?

It is an inert, colorless, odorless, noncorrosive, nonflammable, and extremely cold element. It is a cryogenic liquid (Cryogenic liquids are liquefied gases that have a normal boiling point below -130°F (-90°C)).

Source: PIB

Source: <https://vajiramandravi.com/current-affairs/nitrogen-use-efficiency/>

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