OIH

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION

LOK SABHA
UNSTARRED QUESTION NO. 1427
TO BE ANSWERED ON 9TH DECEMBER, 2025

NEGATIVE IMPACT OF NANO UREA ON GRAIN YIELD AND QUALITY

1427. ADV. CHANDRA SHEKHAR:
SHRI HANUMAN BENIWAL:

Will the Minister of AGRICULTURE AND FARMERS WELFARE कृषि और किसान कल्याण मंत्री be pleased to state:

(a) whether the government is aware that research conducted by the Punjab Agricultural University or any other institution has found that the use of nano urea has had a negative impact on grain yield and quality;

(b) if so, details of the research thereof;

(c) whether it is true that such research has found that the use of nano urea has reduced the protein content of rice and wheat by 35% and 24%, respectively;

(d) if so, the source and details thereof;

(e) whether the Government proposes to take any corrective steps in this direction; and

(f) if so, the steps taken and the time by when it will be implemented and if not, the reasons therefor?

ANSWER

THE MINISTER OF STATE FOR AGRICULTURE AND FARMERS WELFARE
कृषि और किसान कल्याण राज्य मंत्री (SHRI BHAGIRATH CHOUDHARY)

(a) & (b): Yes. The Government is aware of the research conducted by Punjab Agricultural University (PAU) and other institutions on the use of nano urea. A two-year field

experiment by the Department of Soil Science, PAU, evaluated two foliar sprays of IFFCO nano urea (4 mL L^{-1}) applied along with either 0% or 50% of the Recommended Dose of Nitrogen (RDN) in a rice–wheat rotation, and reported that treatments with two nano-urea sprays combined with 50% RDN resulted in a reduction of 13.0% in rice grain yield and 17.2% in wheat grain yield compared to the conventional 100% soil-applied RDN.

Agronomic trials conducted at Indira Gandhi Krishi Vishwavidyalaya (IGKV), Raipur on rice and Vivekananda Parvatiya Krishi Anusandhan Sansthan (VPKAS), Almora on finger millet reported reduction in grain yield by 8.0 % and 12%, respectively on replacing 50 % of Recommended Dose of Nitrogen (RDN) with 02 foliar sprays of nano urea. Further agronomic trials conducted at Hyderabad, Karnal, Bangalore, Jobner and Kalyani reported that replacement of 25% RDN with 2 foliar sprays of Nano urea increased yield of cereals and oilseeds by 5-15%.

However, experiments conducted by 5 ICAR Institutes, 10 SAUs and 27 KVKs on paddy, wheat, mustard, maize, tomato, cabbage, cucumber, capsicum and onion observed crop specific and location specific response of nano urea application.

(c) & (d): Yes. Research has reported that the application of two foliar sprays of IFFCO nano urea (4 mL L^{-1}) along with only 50% of the recommended nitrogen dose (RDN) in a rice–wheat rotation reduced grain protein content by 35% in rice and 24% in wheat, and also lowered key nitrogen-assimilation enzyme activities such as glutamine synthetase (by 28.6%) and glutamate synthase (by 94.4%) when compared with the conventional 100% RDN treatment. These findings were published by the researchers in Plant and Soil (Sikka R., Kalia A., Ahuja R., Sidhu S.K., & Chaitra P., 2025).

(e) & (f): To understand the long-term effects of nano urea on soil nutrients, crop yield, and quality, ICAR has launched a five-year network project called “Evaluation of Nano Urea on Crop Productivity and Nitrogen Use Efficiency in Diverse Agro-Ecological Zones of India”. This project covers 14 centres, 10 major agro-ecological zones, and 12 major crops. The study also aims to clarify how nutrients from nano fertilizers function in plant metabolism. In addition, the Department of Agriculture and Farmers Welfare has issued detailed guidelines and checklists for conducting nano urea trials to ensure proper evaluation and reporting.

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