

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

**LOK SABHA**  
**UNSTARRED QUESTION NO. 1785**  
TO BE ANSWERED ON 10<sup>TH</sup> FEBRUARY, 2026

**BENEFITS OF GENOME EDITED RICE VARIETIES**

1785. SHRI BALASHOWRY VALLABHANENI:

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

- (a) the details of the genome editing;
- (b) whether it is true that India has recently released world's first genome edited rice varieties;
- (c) the way by which the two varieties—DRR Dhan 100 (Kamala) and Pusa DST Rice 1—game changer in sustainable agriculture;
- (d) the quantum of additional Paddy production could be achieved with the above varieties, the extent to which water per hectare can be saved and to what extent to which these new varieties are climate-resistant; and
- (e) whether it is true that the above varieties are suitable to only selected States including Andhra Pradesh, if so, the details thereof?

**ANSWER**

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

- (a): Genome editing is a breeding tool to make targeted and precise editing (mutations) in any genome (DNA). This is a refined and improved version of earlier practiced mutation breeding wherein DNA of plants or animals was randomly edited or mutated using chemicals and radiations.
- (b): Yes. It is true that India has released world's first rice varieties by genome editing viz., DRR Dhan 100 (KAMALA) and Pusa Rice DST1.

(c): DRR Dhan 100 being a genome edited variety give significant 14.12 % enhancement in grain yield over its parent variety, Samba Mahsuri. Pusa Rice DST1 variety demonstrates a yield advantage of 14.66%, 9.66%, and 30.36% under alkalinity, inland salinity and coastal salinity adaptation zone, respectively over MTU1010.

Cultivation of DRR Dhan 100 provides higher productivity, reduced crop duration, lower water and fertilizer requirements, and reduced methane emissions from rice ecosystems. Likewise, Pusa Rice DST1 gives higher productivity in salinity affected rice ecosystems. Thus, both these genomes edited rice varieties with higher yields can prove game changer for sustainable agriculture.

(d): Following large-scale deployment, it is anticipated that paddy production in the regions currently cultivating Samba Mahsuri and MTU1010 will increase by 10-15% over time, as the genome-edited varieties DRR Dhan 100 and Pusa DST Rice 1 progressively replace their respective parent varieties.

Substantial water savings are also projected with the adoption of DRR Dhan 100. Assuming a standard rice water requirement of 100,000 litres per hectare per day, the replacement of Samba Mahsuri with DRR Dhan 100 over 1 million hectares is estimated to save approximately 150,000 million litres of water per season. This estimate is based on a conservative reduction of 15 days in crop duration due to the early maturity of DRR Dhan 100.

Both genome-edited varieties are endowed with key climate-resilient traits. DRR Dhan 100 combines early maturity and lodging resistance, while Pusa DST Rice 1 offers enhanced tolerance to salinity stress. Collectively, these attributes position the varieties as high-impact interventions for improving productivity, resource-use efficiency, and climate resilience in rice-based production systems.

(e): Yes. These two varieties have been identified for selected zones and states based on their two-year performance in field evaluation trials conducted by AICRPR (All India Coordinated Research Project on Rice). DRR Dhan 100 and Pusa DST1 have been identified for the states of Andhra Pradesh, Telangana, Karnataka, Tamil Nadu, Puducherry and Kerala (Zone VII).

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