

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
UNSTARRED QUESTION NO - 3919
ANSWERED ON 12/08/2026

**APPLICATION OF RADIATION TECHNOLOGIES FOR AGRICULTURE
AND FOOD SECURITY**

3919. SHRI TRIVENDRA SINGH RAWAT
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SHRI KOTA SRINIVASA POOJARY
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SHRI AMAR SHARADRAO KALE
SHRI ARUN GOVIL
SHRI BIBHU PRASAD TARAI

Will the PRIME MINISTER be pleased to state:-

- (a) the details of the progress made in the field of development of improved crop varieties and preservation of agricultural produce through radiation technologies so far and whether genetic modifications in the said crops are also likely to cause adverse effects similar to wheat and if so, the details thereof;
- (b) the details of the step taken/works undertaken by the Government to promote the adoption of Trombay crop varieties including climate-resilient and salt-tolerant varieties;
- (c) the details of the initiatives taken by the Government to expand food radiation facilities to reduce post-harvest losses and improve food safety;
- (d) whether the Government proposes to expand the use of the said technology and food irradiation facilities in major agricultural States like Uttar Pradesh and if so, the details thereof; and
- (e) the details of the collaborative efforts undertaken with the State Government, research institutes and other relevant stakeholders to promote the widespread use of radiation technologies in agriculture and food processing?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS
AND PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH)

- (a) Bhabha Atomic Research Centre (BARC), a constituent unit of Department of Atomic Energy (DAE), has developed 72 improved varieties in different crops using radiation-induced mutagenesis along with cross breeding. These varieties have been released and

notified for commercial cultivation across the country in collaboration with Indian Council of Agricultural Research (ICAR) and State Agricultural Universities (SAUs). These include 17 varieties in groundnut, 10 varieties in rice, 9 varieties each in mungbean and mustard, 8 varieties in urdbean, 5 varieties in pigeonpea, 3 varieties in sorghum, 2 varieties each in cowpea, wheat and soybean, one variety each in banana, sesame, linseed, sunflower and jute. Some of the desirable traits in these crops include higher yield, seed size, early maturity, climate resilient traits like drought, heat, salinity tolerance and resistance to diseases. Several of these varieties have high patronage from the farming community and are extensively grown in the country.

Genetic modifications induced through radiations in the different crops do not cause adverse effects. Prior to release, the developed varieties are thoroughly tested through multi-location evaluations over the years and released for commercial cultivation after attaining the superiority over the existing cultivars.

- (b) DAE has undertaken various initiatives to promote the adoption of improved crop varieties in the Indian farming communities. The steps include, large-scale quality seed production of Trombay varieties along with several state agricultural universities (SAUs) and supply to
- i. State seed corporation,
 - ii. State agricultural departments,
 - iii. National Institutes,
 - iv. State agricultural Universities,
 - v. Krishi Vigyan Kendras (KVKs),
 - vi. Farmer Producer Organizations (FPOs),
 - vii. Farmer cooperatives,
 - viii. Non-Governmental Organizations (NGOs),
 - ix. Seed companies and
 - x. Farmers in several States

In addition, DAE has participated in Kisan Melas, Field days, provided technical guidance and training on cultivation practices, conducted exhibitions in different states in collaboration with SAUs. DAE has also conducted Outreach programmes, field demonstrations, distributed seed minikits of the improved Trombay varieties and conducted Public Awareness Programmes on Peaceful Uses of Atomic Energy to render benefit to hundreds of farmers.

(c)&(d) DAE has developed radiation-based food preservation and food processing technologies to reduce the post harvesting losses and extend shelf life of agri products. Also, radiation-based protocols have also been developed for various agricultural products like vegetables, fruits, pulses, spices etc. The technology has been transferred to private entrepreneurs on non-exclusive basis, for commercialization and can be implemented through licensees.

Further, Government has implemented policy measures to expand the radiation technology for food preservation at the country level. Government of India has announced incentives for setting up of multiproduct food irradiation units under 'Integrated Cold Chain & Value Addition Infrastructure' of the Pradhan Mantri Kisan Sampada Yojana (PMKSY) scheme across the Nation in 2024-25. This scheme is open for application by the interested stakeholders.

In the state of Uttar Pradesh, three food irradiation facilities have been commissioned till date in the private sector.

(e) In agriculture, DAE has been consistently evaluating their developed breeding lines/mutants in different crops and their release in different agro-climatic zones in respective states in collaboration with State Agricultural Universities (SAU) and various ICAR institutes. DAE has research collaborations and Memorandum of Understandings (MoUs) with the State Agricultural Universities in Assam, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Uttar Pradesh, West Bengal and following ICAR institutes:

- i) ICAR - Indian Institute of Groundnut Research, Junagadh;
- ii) ICAR-National Soybean Research Institute, Indore;
- iii) ICAR-Indian Institute of Rapeseed Mustard Research, Bharatpur;
- iv) ICAR-Indian Institute of Oilseeds Research, Hyderabad;
- v) ICAR-Indian Institute of Pulses Research, Kanpur; and
- vi) ICAR-National Research Centre for Banana, Trichy.

Department also funds several research projects on mutation breeding and food preservation through Board of Research in Nuclear Sciences (BRNS) projects, an Advisory Body of DAE.
