

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
RAJYA SABHA
UNSTARRED QUESTION NO - 1285
ANSWERED ON 30/07/2026

USE OF RADIATION TECHNOLOGIES IN AGRICULTURE

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Will the PRIME MINISTER be pleased to state:-

- (a) the measures taken to promote use of radiation technologies for preservation of food and agricultural products;
- (b) the details of initiatives undertaken to develop improved crop varieties using radiation-based technologies;
- (c) whether any programmes have been implemented to develop crop varieties suitable for climate-resilient agriculture, including for saline and coastal areas and if so, the details thereof; and
- (d) the details of progress achieved through the said initiatives?

ANSWER

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

- (a) The Department of Atomic Energy (DAE), through one of its constituent units viz. Bhabha Atomic Research Centre (BARC), is promoting the use of radiation technologies for preservation of food and agricultural products by developing standard operating procedures (SOPs) for irradiation of agricultural commodities, preparing standards and guidelines for food irradiation, developing improved radiation facilities, and transferring radiation-based food preservation technologies to private entrepreneurs for commercialization. Radiation processing extends the shelf life of perishable produce, reduces post-harvest losses, enables chemical-free preservation of grains and spices, and helps meet international phytosanitary requirements for export. Currently, 33 food irradiation facilities have been

established in the country, including 7 in the Government sector and 26 in the private sector, with more facilities under different stages of commissioning.

Board of Radiation and Isotope Technology (BRIT), an industrial unit under DAE helps Private /State Government sector in setting up gamma radiation processing facilities for food irradiation & medical devices sterilization by providing necessary technical inputs & supply Co-60 sources. For this purpose, BRIT enters into Memorandum of Understanding with the prospective entrepreneurs for establishing the gamma radiation processing facilities and supports them by supplying Cobalt-60 radioactive sources and providing dosimetry services on a chargeable basis. To date 43 gamma radiation processing facilities have been commissioned across the country with BRIT's support contributing to the wider adoption of radiation technology for food preservation and other industrial applications.

- (b) BARC has developed 72 improved crop varieties using radiation-induced mutagenesis along with cross breeding, which have been released and notified for commercial cultivation across the country in collaboration with Indian Council of Agriculture Research (ICAR) and State Agricultural Universities. These varieties include rice, mustard, sesame, groundnut, urad bean, mung bean, pigeon pea, sorghum, cowpea, wheat, soybean, sunflower, banana, linseed and jute. Some of the desirable traits in these crops include higher yield, seed size, and quality traits, 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.
- (c) Coastal salinity is persistent problem in most of the states like Andhra Pradesh, Gujarat, Tamil Nadu, Odisha and Maharashtra. Radiation technology has been used to develop climate-resilient crop varieties with tolerance to abiotic stresses such as salinity, drought and heat. BARC has developed rice variety such as Trombay Konkan Khara for cultivation in the coastal saline soils of Maharashtra. Similarly, BARC is undertaking research activities in rice with Odisha University of Agriculture and Technology, Bhubaneswar to address most of the regional problems including salinity. In addition, drought- tolerant groundnut varieties and disease-resistant varieties of mungabean, uradbean, soyabean and mustard have been developed and released for cultivation.

- (d) These initiatives have significantly contributed to agricultural productivity and food security. Radiation technologies have extended the shelf life of onion up to 7.5 months and potato up to 8 months while retaining quality, facilitated cost-effective export of irradiated mangoes and pomegranate to countries such as the United State of America (USA), Australia, South Africa and Malaysia, and enabled chemical-free preservation of grains and spices. The 72 improved crop varieties developed by BARC are being cultivated across the country and have gained wide acceptance among the farming community due to their higher productivity, climate resilience and improved agronomic traits.
