Department of Atomic Energy

Food and Seed Irradiations

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The use of radiation in agriculture has resulted in developing improved varieties of seeds resulting in increase in the Gross Domestic Product (GDP) of the country. Bhabha Atomic Research Centre (BARC) is actively working in this area. Using radiation induced mutagenesis along with cross breeding, BARC has developed several varieties of oilseeds, pulses, rice and jute, which have been released and notified for commercial cultivation across the country. The major desirable traits in these crops include higher yield, seed size, improved agronomic and quality traits, early maturity and resistance to biotic and abiotic stresses. Several of these varieties enjoy high patronage among the farming community and are extensively cultivated in the country and contribute substantially to the total agricultural production in the country. BARC is also involved in breeder seed multiplication of its released varieties in the case of crops such as ground nuts and pulses.

According to IMF, GDP is a monetary measure of the market value of all final goods and services produced in a period (quarterly or yearly). Viewed in this context, the improved varieties of crops have substantially contributed to the GDP of the country.

Using mutation (and conventional) breeding, Department of Atomic Energy (DAE) has developed 42 new varieties of crops. These varieties include oilseeds (groundnut, mustard, soybean and sunflower), pulses (urdbean, mungbean, pigeonpea, cowpea), rice and jute.

Mutation breeding through nuclear radiation is mostly done using gamma rays or other ionizing radiations such as electron beam. The method does not render the irradiated material radioactive; it also does not involve insertion of foreign gene into the plant being improved. Irradiation only increases the rate of mutation inside target cells. Mutation is a natural process and, therefore, acceleration of the process using a radiation source is a widely accepted method of producing variability in the population. Plants showing favourable traits are selected and cultivated, ultimately culminating in the production of new varieties. The plants are also extensively tested for various parameters, including nutritional quality of the food, before they are released. Therefore, there is no health hazard to humans and animals that consume the food.

This information was provided by the Union Minister of State (Independent Charge) Development of North-Eastern Region (DoNER), MoS PMO, Personnel, Public Grievances & Pensions, Atomic Energy and Space, Dr Jitendra Singh in written reply to a question in Lok Sabha today.

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