

**GOVERNMENT OF INDIA  
MINISTRY OF SCIENCE AND TECHNOLOGY  
DEPARTMENT OF BIOTECHNOLOGY**

**RAJYA SABHA  
UNSTARRED QUESTION No. 290  
TO BE ANSWERED ON 08/12/2022**

**Per hectare yield advantage associated with GM Mustard**

**290. SHRI SUSHIL KUMAR MODI:**

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

- (a) per hectare yield advantage associated with GM Mustard as compared to different High Yielding Varieties of mustard;
- (b) the reasons for GM Mustard not been classified as an Herbicide Tolerant (HT) crop variety despite the presence of the Bars gene;
- (c) whether any field trial has been conducted to assess the impact on human health, environment, honey bee population and honey production, if so, the details thereof; and
- (d) whether there is evidence of declining honey production associated with the cultivation of GM cotton in the country in the last ten years, if so, the details thereof?

**ANSWER**

MINISTER OF STATE (INDEPENDENT CHARGE) OF SCIENCE & TECHNOLOGY  
AND EARTH SCIENCES  
(DR. JITENDRA SINGH)

(a) GM mustard hybrid Dhara Mustard Hybrid-11 (DMH-11) has been tested for three years (2010-11, 2011-12, 2014-15) against national check Varuna and zonal check RL1359 during the confined field trials i.e., Biosafety Research Level (BRL)-I and BRL-II trials at multiple locations. DMH-11 showed approximately 28% more yield than the national check and 37% more than the zonal checks.

(b) Bar gene is responsible for herbicide tolerance and its use has been claimed and approved by the Genetic Engineering Appraisal Committee (GEAC) during hybrid seed production phase to maintain the genetic purity of hybrid seed by killing male fertile plants in female rows in seed production plot only and not during commercial cultivation by the farmers.

(c) Yes, field trials for three years (two years of BRL-I and one year of BRL-II) have been conducted to assess the impact on human health and environment as per the stipulated guidelines and applicable rules. Extensive studies carried out on toxicity (both acute and sub-chronic), allergenicity, compositional analysis, field trials and environmental safety studies of GM mustard lines vs. their non-transgenic comparators have provided evidence that mustard (*B. juncea*) lines Varuna bn 3.6, EH-2 modbs 2.99 and DMH-11 are safe for cultivation and for food and feed use. Visitation of bees to the transgenic lines is similar to the non-transgenic counterparts as per the data recorded during the BRL-I and BRL-II trials conducted over three growing seasons at multiple locations as per the protocols approved by Review Committee on Genetic Manipulation (RCGM) and GEAC.

(d) No such evidence has been reported. On the other hand, studies conducted during 2018-19 and 2019-20 indicated that there is no negative impact of Bt transgenic cotton cultivars on bees, brood rearing, pollen and nectar hoarding of *Apis mellifera* colonies as compared to non-transgenic cotton cultivars.

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