

DMH-11 Mustard Variety [UPSC Notes]

DMH-11 gets the approval of the Genetic Engineering Appraisal Committee (GEAC) for being introduced into the environment. In this article, you can read all about the genetically modified mustard variety developed in India. This is an important topic for the [UPSC exam](#) General Studies III paper.

What is DMH-11?

The full form of DMH is **Dhara Mustard Hybrid**. It is a **genetically modified crop**, only second after GM cotton, to get approval for being inducted into the environment for seed production and testing. GM cotton is commercially used in India.

- The signature feature of DMH is that it carries a gene for **herbicide resistance**. i.e **herbicide tolerant**.
- It has been developed by scientists from the Centre for Genetic Manipulation of Crop Plants (CGMCP), Delhi University.
- They developed the hybrid containing two alien genes isolated from a soil bacterium called *Bacillus amyloliquefaciens*.
- The barnase-barstar GM technology was deployed to develop DMH-11. The researchers a popular Indian mustard variety 'Varuna' (the barnase line) with an East European 'Early Heera-2' mutant (barstar).
- It contains 3 important genes **Bargene, Barnase and Barstar**, all derived from soil bacterium.
- It would be a **high yielding variety** of the mustard crop.
- This is significant because it can help India achieve self-sufficiency in oil production and save on forex. Currently, India is the world's leading importer of edible oils and more than 50% of the domestic demand for edible oils is met through imports.

GM Crops

- GM crops are derived from plants whose genes are artificially modified, generally by inserting genetic material from another organism, to give it new properties, such as improved nutritional value, increased yield, resistance to disease or drought, tolerance to a herbicide, etc.
- In India, only one GM crop, BT Cotton is approved for commercial use.

Concerns associated with DMH-11

The introduction of DMH-11 and its **long-term effects on the environment were not taken into serious consideration** before taking the decision to introduce them into the environment.

- **Details of the trial and its outcome on food safety and environmental sustainability** have not been made public before sanctioning its introduction.
- A potential long-term assessment of the social and economic impacts of these crops is yet to be made.
- Various studies reveal that introduction of **herbicide-resistant or HT crops** had led to adverse impacts on the environment. **This outcome had been noticed in several countries like the US, Australia, Canada and Argentina.** Thus both developed and developing countries are experiencing the adverse impact of such an initiative.
- The most evident outcome of these crops is the **spread of herbicide-resistant weeds across large tracts of agricultural land.** This can lead to catastrophe in the long run.
- There is also an apprehension that the **seeds of this crop cannot be used for regeneration.** Hence, the farmers need to buy new seeds every time they want to grow the crops.
- There is also a likelihood that these crops could lead to **disruption in species diversity.**
- There is the ethical question of whether it is correct to violate natural organisms' intrinsic values by mixing among species.
- Also, the seeds of GM crops in general are produced only by a handful of companies. Such a monopoly can lead to seed buyers having few choices and price manipulation by corporations.

What is the Genetic Engineering Appraisal Committee (GEAC)?

It is one of the extended arms of the **Ministry of Environment, Forests and Climate Change (MOEFCC).** It is a statutory body.

- This institution is responsible for the **introduction of any GM crop into the environment in the country.**
- This committee is headed by the **special secretary of the Ministry of Environment, Forests and Climate Change.** A representative of the Department of Biotechnology is a co-chair.

Conclusion: GM crops can have a long-term effect on the environment and thereby on the life of the people. So it is imperative that in-depth study must be conducted on GM crops before introducing them into the environment.