



KAMARAJ IAS ACADEMY
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Genetically Modified Mustard

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Why is in news? Is there a compelling reason for GM mustard; will it not affect environment, asks SC

Mustard is one of India's most important winter crops which is sown **between mid-October and late November**.

The **Indian mustard (Brassica juncea)** is a member of the Brassicaceae family.

Mustard is cultivated by around 6 million farmers in around 6.5-7 million hectares of land across the states of **Rajasthan, Haryana, Punjab and Madhya Pradesh**.

Currently, India has a **deficit of edible oils** by almost 55-60 per cent of the total consumption. India desperately requires an increase in the productivity of oilseed crops grown in the country. The average mustard yield in India is 1.0-1.3 tonnes/hectare.

Globally, yields of rapeseed have considerably increased with the introduction of hybrids. More than 90% of the rapeseed crop in Canada, grown in around 8.7 million ha, is under hybrids. Most of the rapeseed grown in China and Europe is also hybrids.

In October 2022, the **Genetic Engineering Appraisal Committee (GEAC)** recommended the environmental release of the genetically-modified (GM) **mustard (Brassica juncea) variety DMH (Dhara Mustard Hybrid)-11** for the development of new generation hybrids, paving the way for the **commercialisation of the country's first GM food crop**.

The decision to release GM mustard will **encourage more research and innovations** to reduce the environmental footprints of agriculture, develop climate resilient crops, and thereby assure food and nutritional security of the country.

It will also accelerate breeding efforts to **produce new high yielding disease and pest resistant hybrids** using this new technology cleared by the Government of India.

Australia has recently on 19 October, **released herbicide tolerant GM Indian mustard** to meet the increasing global demand of edible oil.

The GEAC said that the commercial use of DMH-11 hybrids will be subject to the **Seed Act, 1966**, and related rules and regulations.

According to **South Asia Biotechnology Centre (SABC)**, the GM Mustard is so helpful in honey industry.

In GM mustard, hybrid DMH-11 is fully fertile with pollen viability similar to the parental line Varuna and has fully developed nectaries.

Around **50-60 per cent of the total production of honey in India is mustard honey**, which makes the crop vital for the survival of the honey industry.

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The DMH-11 mustard variety is **herbicide tolerant**, allowing farmers to spray over the crops with weed killer without harming the crops. This has raised fears that farmers may resort to **excessive use of toxic herbicides** which can **lead to weeds becoming resistant to them and the emergence of so-called superweeds**. Critics are also concerned about herbicide residue on GM crops.

Genetic Engineering Appraisal Committee:

Genetic Engineering Appraisal Committee (GEAC), established under the Ministry of Environment and Forest and Climate Change (MoEF&CC), is the **apex body**, notified under Rules 1989, of the **Environment Protection Act 1986** for approval of activities involving large-scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental safety angle.

The GEAC is also responsible for the **approval of proposals relating to release of genetically engineered organisms and products into the environment** including experimental field trials (Biosafety Research Level trials-I and II also known as BRL I and BRL II).

GMOs	
Pros	Cons
<ul style="list-style-type: none">▪ GMOs can help us to increase crop yields▪ Use of genetically modified organisms can reduce the global hunger problem▪ More people may get out of poverty▪ GMOs may contain higher amounts of beneficial substances▪ Can make plants more resistant▪ GMOs may help to lower food prices▪ Efficient land use▪ Easy to cultivate GMOs▪ Less work is needed in agriculture▪ Taste of food may be improved through GMOs▪ We can save water in agricultural processes▪ Longer shelf-life of genetically modified food	<ul style="list-style-type: none">▪ Religious concerns regarding GMOs▪ Humans should not play god▪ Spread of serious epidemics or pandemics▪ We may underestimate the risk of GMOs▪ Possible safety issues of GMOs▪ GMOs may also alter the DNA of natural plants▪ Allergic reactions related to GMOs▪ GMOs may have the potential to alter our DNA▪ May make us more vulnerable to serious diseases▪ Insufficient objectivity related to GMOs▪ Use of GMOs is not natural▪ May lead to antibiotic resistance▪ GMO labels are often missing or misleading