



# Genetically Modified (GM) Crops

## Why in News

According to the Coalition for GM Free India, the discovery of 500 tonnes of [Genetically Modified \(GM\)](#) rice in a consignment that India exported to the [European Union](#) countries in June 2021 has led to the “**loss of reputation of India and its agricultural market**”.

- However, India pointed out that **GM rice is not grown commercially in India**, let alone exported, and promised a thorough enquiry by its agricultural exports authority, the [Agricultural and Processed Food Products Export Development Authority \(APEDA\)](#).

## Key Points

### ▪ GM Crops:

- GM foods are **derived from plants whose genes are artificially modified**, usually by **inserting genetic material from another organism**, in order to give it a new property, such as **increased yield, tolerance to a herbicide, resistance to disease or drought, or to improve its nutritional value**.
- Probably the **best known variety of GM rice is golden rice**.
  - Golden rice involves the insertion of genes from a plant -- both daffodils and maize have been used -- and a soil bacterium to create a grain that is enriched with Vitamin A.
- **India has approved** commercial cultivation of **only one GM crop, Bt cotton**.
- No GM food crop has ever been approved for commercial cultivation in the country.
  - However, confined field trials have been allowed for at least 20 GM crops.
- That includes varieties of **GM rice** which would have improved resistance to insects and diseases, as well as hybrid seed production and nutritional enhancements such as golden rice.
- The **cons of GM foods** are that they **may cause allergic reactions** because of their altered [DNA](#) and they may **increase antibiotic resistance**.

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**What is a GM crop?**  
A crop which has a gene artificially inserted into it from another species, even unrelated, to give it some desired properties. GM crops are mostly either pest-resistant or herbicide-tolerant

**When did India get its first GM crop?**  
The first GM crop variety approved for commercialisation was Bt cotton. Bollgard-I, which provided immunity against the pink bollworm and developed by Monsanto, was given the go ahead in 2002. Monsanto released Bollgard-II in 2006. India has become the world's largest producer of cotton partly due to Bt cotton, which accounts for over 90% of the total cotton acreage in the country

**Are there other GM crops in India?**  
No, the government has not approved commercial cultivation of other GM crops, though efforts have been made for brinjal and mustard

### ▪ Export of GM Rice (Implications for India):

- India is the **world's top rice exporter**, earning Rs. 65,000 crore in 2020 by selling 18 million tonnes of grain (organic rice), about a quarter of which is premium **basmati**.
- Among the 75 countries which buy Indian rice, **West Asian nations, the US and the U.K. are the biggest importers of basmati**, while the majority of non-basmati goes to African countries and neighbours Nepal and Bangladesh.
- **For Indian farmers**, the nightmare scenario could be what happened in the US in 2006, when trace amounts of a GM rice variety were found in shipments ready for exports.
  - Trading partners such as Japan, Russia and the EU **suspended rice imports from the US**, hitting farmers hard.
- Under pressure from the rice export lobby at the time, India **drafted policies to ban GM rice trials in the basmati belt**. However, farmers from other parts of the country, especially those aiming for the nascent but growing organic rice export market, worry that their products could face contamination.
  - **Unauthorised HtBt Cotton and Bt Brinjal are already being grown** commercially, with hundreds of growers blatantly defying the governmental ban.

### Way Forward

- India's top rice scientists seem to have **moved away from conventional GM rice research** for the time being.
  - Recently, **first varieties of non-GM herbicide tolerant rice** were launched which can also be directly seeded, thus saving on water and labour costs (**Pusa Basmati 1979 and Pusa Basmati 1985**).
  - The IARI (Indian Agricultural Research Institute) is also working to create drought-tolerant, salinity-tolerant rice strains through **new gene editing technology (Site Directed Nuclease (SDN) 1 and 2)** - which is yet to gain regulatory approval -- which allows for tweaking the rice plant's own genes without introducing the genes of any other organism.
- In the face of such new advances, **the regulatory regime needs to be strengthened**, for the sake of domestic as well as export consumers.
- Technology approvals must be **streamlined and science-based decisions implemented**.
- **Rigorous monitoring is needed** to ensure that safety protocols are followed strictly, and enforcement must be taken seriously to prevent the spread of illegal GM crops.

**Source: TH**

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