



TATHASTU ICS



DAILY CURRENT AFFAIRS

SEPTEMBER 16, 2023

A GM CROP DECISION THAT CUTS THE MUSTARD

Source: [The Hindu](#)

Context: The adoption of genetic engineering and advanced scientific methods in crop improvement is crucial for addressing **global food security challenges in the face of climate change**. This shift is driven by the need **to achieve 'Zero Hunger' by 2030** and adapt to evolving food production demands in a dynamic world.

The Importance of GM Crops:

- **Importance of Science-Based Crop Technologies:** Incorporating scientific advancements, including genetic engineering, is vital for enhancing crops in the current context. It complements traditional breeding methods and is crucial for achieving global food and nutritional security amid changing climate conditions.
- **Challenges Highlighted in 2019 Food Security Report:** The 2019 Global Food Security and Nutrition Report emphasized the formidable challenge of reaching the 'Zero Hunger' goal by 2030.
- **Urgency to Accelerate Genetic Crop Improvement:** To effectively address these challenges, there is a pressing need to expedite genetic crop improvement, underlining the importance of accelerating progress in this field.
- **Impact of Green Revolution:** The Green Revolution in the 1960s and 70s significantly boosted food production, increasing it from 50 million tonnes in 1950-51 to over 300 million tonnes in 2020-21.
- **Need for New Biotech/GM Crops:** However, the dynamic nature of climate necessitates the development of new biotech/GM crops with enhanced traits. These crops are essential for combating climate change and providing nutrient-dense food for a growing global population.
- **Success of Genetic Crop Modification:** Genetic modification of crops, harnessing extensive genetic diversity alongside traditional farming, has proven successful in increasing productivity and contributing to global food, feed, and fiber security.

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

Are there other GM crops in India?

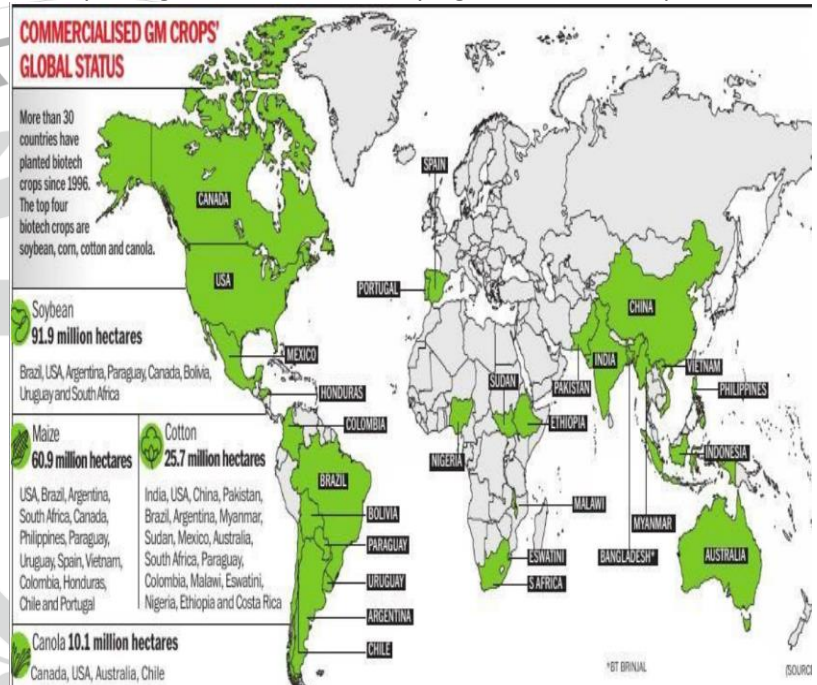
No, the government has not approved commercial cultivation of other GM crops, though efforts have been made for brinjal and mustard

GM CROPS IN INDIA A PRIMER

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

- **Global Adoption of GM Crops:** A 2020 report by the International Service for the Acquisition of Agri-biotech Applications (ISAAA) reveals that GM crops have been embraced by 72 countries for various purposes, including human consumption, animal feed, and commercial cultivation.
- **Benefits Reaching Billions:** GM crops have benefited over 1.95 billion people across five countries, constituting 26% of the world's current population, including Argentina, Brazil, Canada, India, and the United States.
- **Success of Bt Cotton in India:** Bt cotton, introduced as India's first GM crop over two decades ago, stands as a testament to the global success of this technology.
- **Expansion of Genetic Modification:** Genetic modification has extended beyond major crops like maize, soybean, cotton, and canola, encompassing various economically significant food crops, addressing traits such as insect and herbicide resistance, climate resilience, and nutritional enhancement.
- **Substantial Economic Gains:** Global economic gains attributed to GM crops from 1996 to 2018 have reached \$224.9 billion, directly benefiting over 16 million farmers, with an impressive 95% of them from developing nations.
- **Proven Biosafety of GM Crops:** GM food crops, adopted globally since 1996, have demonstrated their biosafety over the last 25 years and continue to do so.



Challenges:

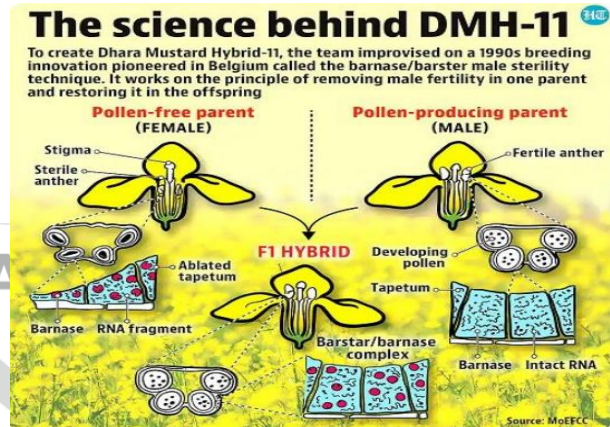
- Amidst the backdrop of these promising advancements, India grapples with a **significant deficit in edible oils**. Approximately **60% of the country's edible oil demand is met through imports**.
- Mustard, a vital **edible oil crop in India**, currently **experiences low yields per hectare**.
- **Enhancing mustard productivity becomes a vital component** of ensuring farmers' economic well-being and achieving self-sufficiency in edible oil production.
- The **consequences of cultivating genetically modified (GM) crops**, such as GM mustard, on various aspects like public health, the environment (including soil quality), the food chain, and groundwater remain uncertain.

- **Ethical concerns** surround GMs, including issues related to violating the intrinsic values of natural organisms and tampering with nature by intermingling genes across species.

Way Forwards:

- **GM Mustard Hybrid DMH 11 Benefits:** The introduction of GM mustard hybrid DMH 11, known for its higher vigor and yield, holds significant promise. This development is expected to boost domestic edible oil production and improve farmers' incomes.

- **Genetic Basis in the Barnase/Barstar System:** The GM mustard hybrid is based on the barnase/barstar system, a genetic engineering technique that addresses male fertility in one parent and restores it in the offspring.



- **Key Role of Research at CGMCP, University of Delhi South Campus:** Extensive research conducted at the Centre for Genetic Manipulation of Crop Plants (CGMCP), University of Delhi South Campus, has been pivotal in creating this GM mustard hybrid.
- **Utilizing Herbicide Tolerance Gene for Enhancement:** The incorporation of the herbicide tolerance gene as a selection marker in GM mustard development highlights the multifaceted potential of genetic engineering in crop improvement.
- **GEAC Approval Marks Milestone:** A significant milestone was reached on October 25, 2022, when the Genetic Engineering Appraisal Committee (GEAC) of the Ministry of Environment, Forest, and Climate Change, Government of India, approved the release of DMH 11 and its parental line for cultivation.
- **Hybrid Production for Higher Yields and Improved Quality:** GEAC's decision to allow barnase/barstar-based hybrid production in mustard opens doors to breeding mustard hybrids that not only offer higher yields but also possess disease resistance and improved oil quality.
- **Benefits for Farmers and Increased Incomes:** This advancement is poised to benefit farmers by increasing yield per hectare, subsequently boosting their incomes.
- **Contributing to Self-Reliance in Edible Oil Production:** Considering India's domestic edible oil consumption of around 25 million tonnes and edible oil imports of approximately 13 million tonnes, the cultivation of these indigenous GM mustard hybrids can play a pivotal role in enhancing farmers' incomes, reducing the burden of oil imports, and ultimately achieving much-needed self-reliance in edible oil production.

Prelims Facts :

- GM crops are plants whose genetic makeup has been artificially modified by incorporating genetic material from other organisms. This genetic alteration aims to confer new characteristics to the crop, such as increased yield, resistance to herbicides, tolerance to diseases or drought, or improved nutritional content.
- **Notable GM Crop:** Golden Rice One prominent example of GM rice is golden rice, created by introducing genes from plants like daffodils and maize, along with genetic material from a soil bacterium. This modification enriches the rice grain with Vitamin A.
- **GM Crops in India:** In India, the approval for commercial cultivation has been granted to only one GM crop, which is Bt cotton. No GM food crop has received clearance for commercial cultivation within the country.
- **Confined Field Trials:** However, India has permitted confined field trials for approximately 20 different GM crop varieties. These include GM rice varieties designed to enhance resistance against pests and diseases, promote hybrid seed production, and improve nutritional content, such as golden rice.
- **Concerns Associated with GM Foods:** It's important to note that GM foods come with certain drawbacks. These modified crops have the potential to trigger allergic reactions due to their altered DNA. Additionally, they may contribute to increased antibiotic resistance.

PYQ 2018

Q. With reference to the Genetically Modified mustard (GM mustard) developed in India, consider the following statements:

1. GM mustard has the genes of a soil bacterium that given the plant the property of pest-resistance to a wide variety of pests.
2. GM mustard has the genes that allow the plant cross-pollination and hybridization.
3. GM mustard has been developed jointly by the IARI and Punjab Agricultural University.

Which of the statements given above is/are correct?

- a. 1 and 3 only
- b. 2 only
- c. 2 and 3 only
- d. 1, 2 and 3

The correct Answer. B i.e. only statement 2 is correct.

Statement 1 is incorrect: GM mustard has been developed with the genes that make it resistant to pests like aphids and whiteflies, not from a soil bacterium.

Statement 2 is correct: GM mustard has been developed to cross-pollinate and hybridize, which allows for better yield and quality.

Statement 3 is incorrect: GM mustard has been developed by the Delhi University's Centre for Genetic Manipulation of Crop Plants (CGMCP) in collaboration with the National Dairy Development Board (NDDB) and the Indian Council of Agricultural Research (ICAR).

GOODS TRADE DEFICIT HITS A 10-MONTH HIGH

SOURCE- [THE HINDU](#), [THE ECONOMIC TIMES](#)

WHY IN NEWS

India's trade dynamics have witnessed significant developments in recent times, with notable implications for the country's economy. Recently India's trade scenario, particularly focusing on the declining goods exports, reduction in services exports, and the surge in the goods trade deficit during August.

ABOUT INDIA'S TRADE TRENDS

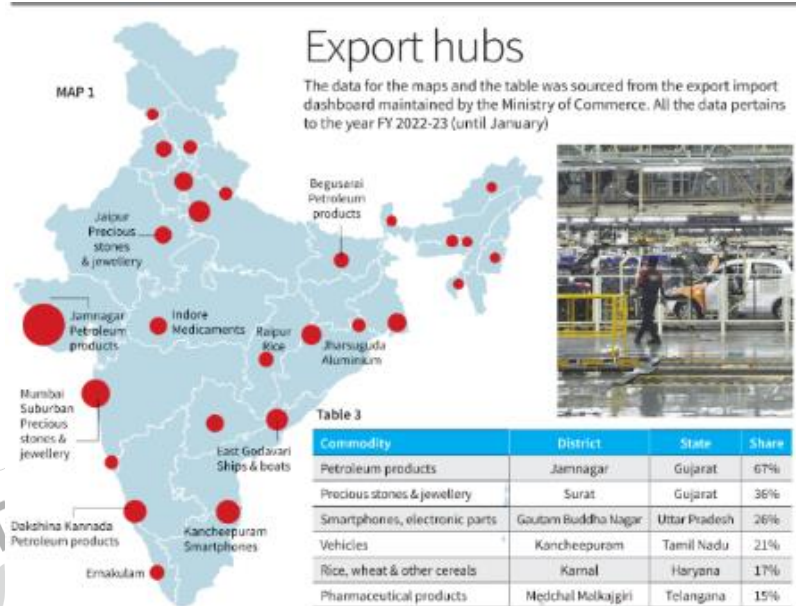
- **Economic Impact:** The surge in imports played a pivotal role in widening the trade deficit. This development has notable repercussions for India's foreign trade dynamics, prompting a need for strategic considerations to address the trade imbalance.
- **Goods Trade Deficit:** The goods trade deficit in August reached a 10-month high, totaling a substantial \$24.16 billion. This highlights a significant imbalance between the value of imports and exports.
- **Services Exports Reduction:** While services exports had been on a growth trajectory, they are now estimated to have experienced a decline in August, further complicating the trade scenario.
- **Goods Exports Decline:** In August, India's goods exports marked their seventh consecutive month of contraction, signaling a concerning trend in the country's export sector.
- **Merchandise Import Bill:** Although the import bill for merchandise in August decreased year-on-year, it saw a noteworthy rise compared to July, reaching a total of \$58.64 billion.



REASONS FOR INCREASING TRADE DEFICIT

- **Increased Import Demand:** Rising consumer and business demand for foreign goods and services can lead to higher imports, causing a trade deficit.
- **Economic Growth:** Strong economic growth can boost imports as domestic consumption and investment rise.
- **Currency Exchange Rates:** Exchange rate fluctuations can affect trade balances, with a weaker domestic currency increasing import costs.

- **Consumer Preferences:** Changing consumer preferences for foreign products can drive up imports.
- **Trade Agreements:** Trade agreements can influence trade imbalances, often leading to increased imports.
- **Economic Policies:** Government policies, like tariffs, can impact imports and exports.
- **Global Economic Conditions:** Economic slowdowns in trading partners can reduce export demand while maintaining import levels.



STRATEGIC DIRECTIONS FOR TRADE IMPROVEMENT

- **Export Promotion:** Encourage and support domestic industries to increase exports through incentives, reduced export barriers, and market diversification.
- **Diversify Exports:** Promote the diversification of both export products and markets to reduce reliance on specific sectors or trading partners.
- **Boost Domestic Production:** Invest in domestic industries and manufacturing to reduce import dependency and enhance competitiveness.
- **Currency Management:** Monitor and manage currency exchange rates to ensure competitiveness for exports without inflating import costs excessively.
- **Comprehensive Policy Framework:** Develop and implement a cohesive strategy encompassing trade agreements, infrastructure development, research and development, economic diversification, policy coordination, long-term planning, foreign direct investment attraction, and prudent fiscal and monetary policies to manage trade balances effectively.

India's Top Exporting Districts in FY23 (till January):

- 1) **Jamnagar, Gujarat:** Jamnagar in Gujarat is the leading exporting district in India, contributing approximately 24% of the country's total exports in value terms for the fiscal year 2023 (till January).

- 2) **Surat, Gujarat:** Surat, also located in Gujarat, secures the second position among India's top exporting districts. However, its contribution to the nation's exports is significantly lower, at around 4.5%, compared to Jamnagar.
- 3) **Mumbai Suburban, Maharashtra:** Mumbai Suburban district in Maharashtra ranks third in the list of top exporting districts in India. Similar to Surat, its share in the country's exports stands at approximately 4.5% during the same period.
- 4) **Dakshina Kannada, Karnataka**
- 5) **Devbhumi Dwarka, Gujarat**

UPSC PYQ 2020

With reference to the international trade of India at present, which of the following statements is/are correct? (2020)

1. India's merchandise exports are less than its merchandise imports.
2. India's imports of iron and steel, chemicals, fertilizers, and machinery have decreased in recent years.
3. India's exports of services are more than its imports of services.
4. India suffers from an overall trade/current deficit.

Select the correct answer using the code given below:

- a) 1 and 2 only
- b) 2 and 4 only
- c) 3 only
- d) 1, 3 and 4 only

ANSWER d

Q.52 (Set A), UPSC CSP 2020.

India is a net exporter in services. Observing the recent trends, there was a surplus of \$6.84 billion in June, with exports standing at \$16.48 billion and imports at \$9.64 billion. Hence 3 is correct. As per RBI's data, India's merchandise exports during April-August 2019-20 was 133 bn USD as compared to 210 bn of imports during the same period. Hence statement 1 is correct. India suffers from an overall trade deficit. For instance-

Year	2015	2016	2017	2018	2019
Trade Balance (in USD bn)	-117.3	-108.9	-158.6	-182.3	-153.5

Hence 4 is correct.

India's trade deficit narrowed sharply to USD 6.77 billion in August of 2020 from USD 13.86 billion in the same month last year.

In 2018, major countries to which India Exported include the United States, United Arab Emirates, China, Hong Kong and Singapore.

Additional Information

Export of iron and steel products witnessed a sharp rise of more than 100% in June 2020. Hence 2 is incorrect.

Chemicals include dyes and dye intermediates, organic chemicals, inorganic chemicals, agro-chemicals, cosmetics & toiletries, and castor oil.

From April 2019 to January 2020, the export of dyes increased by 9.12% y-o-y to US\$ 2.27 billion.

Cosmetics and toiletries increased by 5.62%. Hence 2 is incorrect.

