

GM MUSTARD: A WIN FOR SCIENCE AND THE FARMER

Context

- The Ministry of Environment, Forests and Climate Change recently approved for environmental release of genetically modified (GM) mustard hybrid (DMH 11), paving the way for commercial use of the first GM food crop based on the recommendations of Genetic Engineering Appraisal Committee (GEAC).

About GEAC

- GEAC, under the Ministry of Environment, Forests and Climate Change is a body responsible for appraisal of proposals relating to the “release” of GM organisms and products (ordinarily considered hazardous) into the environment.

Developing GM Mustard Hybrid DMH 11

- **About hybridisation:** It involves crossing two genetically dissimilar plant varieties that can even be from the same species. The first-generation (F1) offspring from such crosses tend to have higher yields than what either parent can individually give.
- **Challenge:** Such hybridisation isn't easy in mustard, as its flowers have both female (pistil) and male (stamen) reproductive organs, making the plants largely self-pollinating.
- **New variety:** But by genetic modification (GM), scientists at Delhi University's Centre for Genetic Manipulation of Crop Plants (CGMCP) developed the hybrid mustard DMH-11 containing two alien genes (namely 'barnase' and barstar' genes) isolated from a soil bacterium called *Bacillus amyloliquefaciens*.
- **Significance:** Mustard varieties in India have a narrow genetic base. The barnase-barstar system enables breeding of hybrids from a wider range of mustards, including those of East European origin such as 'Heera' and 'Donskaja'.
 - DMH-11 is also claimed to have shown an average 28% yield increase over Varuna in contained field trials carried out by the Indian Council of Agricultural Research (ICAR).
 - New hybrid GM seeds could potentially raise mustard yields to 3.0-3.5 tonnes per hectare, up from around 1.3 tonnes now.

Opposition to grant GEAC clearance to DMH-11

- **Promote widespread herbicide usage:** The presence of a ‘bar’ gene, makes GM mustard plants tolerant to the spraying of glufosinate ammonium, a chemical used for killing weeds.
 - This, the opponents allege, will cause displacement of manual labour engaged in weeding by promoting use of chemical herbicides.
- **Threaten biodiversity:** The second concern is over GM mustard threatening or undermining the population of honey bees. Mustard flowers are a source of nectar for honey bees and many other pollinator insects.

Unfounded fears of GM crops

- **Earlier concerns:** The reservations expressed and objections related to GM crops are not new.
 - These were also expressed when India imported the dwarf miracle seeds of wheat and rice in 1966 to achieve food self-sufficiency through the Green Revolution and also when Bt Cotton was being released in 2002.
- **Positive experience:** Bt cotton’s success in boosting yields and turning India from an importer to the world’s second largest exporter is well-documented.
 - Also, no adverse outcomes have been reported from the consumption of its oil and seed cake fed to cattle over the last 20 years.

Need for GM technology

- **Meeting current challenges:** The best option is scientific innovations and their scaling to meet up today’s issues as follows:
 - Over-exploitation of natural resources (soil, water, biodiversity)
 - Declining factor productivity
 - Urgency to achieve sustainable development goals, especially ending poverty and hunger
 - Addressing timely the adverse effects of climate change
- **Global adoption:** The genetically modified maize, soybean, cotton, tomato and canola are grown across the world and the area currently under GM crops is about 200 m ha.

- Besides India, these have been grown for many years in the US, Brazil, Argentina, Canada, Australia, Philippines, Pakistan, Bangladesh, and China.
- For instance, yields of canola in Canada, China and Australia are almost three times higher than in India since they use GM hybrid technology.
- **Swelling demand:** Australia has recently released herbicide-tolerant GM Indian mustard, using similar technology. This is to meet the growing demand of mustard oil in South Asian countries.
- **No health risks:** It is scientifically proven that the consumption of refined oil does not allow any protein to enter the human system. Thus, the consumption of GM oil is completely safe from a health point of view.
- **Minimizing costs:** To meet the existing deficit in edible oils (about 55-60 per cent), India is currently importing 14-14.5 mt that entailed a record foreign exchange outgo of \$18.99 billion in the fiscal year ended March 31, 2022.
- Of this, 2.0-2.5 mt soybean oil and 1.0-1.5 mt canola oil is already GM. Hence, we are consuming GM oil already, besides, the 1.5 mt of GM cotton oil produced domestically.
- **Boosting yields:** A major concern of Indian farmers is that yields of mustard (an important oilseed crop,) are low and have stagnated for a long time at around 1,260 kg/ha, much lower than the global average of 2,000 kg/ha.

Conclusion

- A country importing over 60 per cent of its edible oil requirements cannot afford the luxury of indefinitely blocking the technology for its farmers.
- The decision to remove the unscientific ban on GM crops reflects the determination of the government to move towards Atmanirbhar Bharat.
- It also meets the long-awaited aspirations of our scientific community and the farmers to derive the benefits of innovative technologies.

[LULA DA SILVA DEFEATS BOLSONARO IN BRAZIL PRESIDENTIAL ELECTION](#)

In News:

- Brazilian leftist leader Luiz Inacio Lula da Silva narrowly defeated President Jair Bolsonaro in a run-off election.
- The Supreme Electoral Court declared Mr. Lula the next President, with 50.9% of votes against 49.1% for Mr. Bolsonaro.

Presidential Election in Brazil

Electoral system

- Brazil is a presidential republic. The president and state governors are elected by an absolute majority with a run-off election, if necessary.
- The president and state governors may serve for two consecutive four-year terms.
 - The Constitution does not prohibit a third non-consecutive term. Hence, they may run again after a subsequent four-year term.
- The Constitution defines three electoral systems for different positions, which are detailed in the Electoral Code:
 - A simple majority system is used to elect senators;
 - An absolute majority system is used to elect the president and governors; and
 - A proportional representation system is used to elect federal districts & state deputies.
- Elections for the 81-member Federal Senate take place every four years, alternately for one-third and two-thirds of its members.
 - At the election, held recently, one-third, or 27, senators are to be chosen.

Voting eligibility

- Voting is compulsory in Brazil for all those who are literate and aged between 18 and 70. The Electoral Code defines the civil penalties for eligible voters if they fail to vote.
- People aged 16 to 17 or older than 70 or who cannot read or write can cast a ballot if they wish.

Election Process

- Under Brazil's election rules, if no candidate in the elections for president and governors receives more than 50% of the vote, there will be a second round.
- In the current election, held on October 2, none of the contesting candidates was able to secure at least 50% of the votes.

- Hence, the top two - leftist former leader Lula and incumbent far-right president Bolsonaro - advance to a second-round election, held on Oct. 30.
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GANGETIC DOLPHIN



According to Uttar Pradesh Government, Dolphins have started coming back to the Ganga river with improvement in the quality of its water through the Namami Gange programme.

About:

- The Gangetic Dolphin is a **fresh-water species**, and one of the few river dolphins found in the world.
- It inhabits the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems of Nepal, India, and Bangladesh.
- **Common Names:**Blind dolphin, Ganges dolphin, Ganges susu, hihu, side-swimming dolphin, South Asian River Dolphin
- **Scientific name:**Platanista gangetica
- The Gangetic Dolphin has been recognized as India's National Aquatic Animal and is the official animal of the Indian city of Guwahati.

Description:

- A long thin snout, rounded belly, stocky body and large flippers are characteristics of the Ganges River dolphin.
- It feeds majorly on fishes and is are usually found in counter current systems of the main river channel.
- Its eyes lack lens, and as a result, this species is also referred to as the "blind dolphin".
- They have a highly developed bio sonar system that facilitates them to hunt for fish even in murky waters.

- Being a mammal, the Ganges River dolphin cannot breathe in the water and must surface every 30-120 seconds. Because of the sound it produces when breathing, the animal is popularly referred to as the 'Susu'.

Conservation status:

- The population of the Ganges dolphin is estimated to be a few hundred.
- IUCN Status: **Endangered**
- It is placed in **Schedule-I of the Wildlife (Protection) Act**
- It is listed on **CITES Appendix I**, which lists species that are the most endangered among CITES-listed animals and plants

RBI LAUNCHES FIRST PILOT PROJECT FOR DIGITAL RUPEE

In News:

- The Reserve Bank of India (RBI) recently launched its first pilot project to use central bank digital currency (CBDC) in the wholesale market for secondary trade in government securities (G-secs) beginning November 1.
- Within a month, a second pilot project on retail use of the digital rupee will begin in closed user groups.

India's Digital Currency Plans:

About a Central Bank Digital Currency (CBDC):

- If a virtual currency (be it a cryptocurrency) is recognised by the central bank it is known as the CBDC.
- CBDCs are the virtual or electronic form of fiat currencies (like the Indian rupee). Hence, a CBDC is the legal tender issued by a central bank in a digital form.
 - It would appear as a liability on a central bank's balance sheet.
- Many countries are exploring CBDC, with the **Bahamian** Sand Dollar was the first to debut CBDC in 2020, while **Jamaica's** JAM-DEX was the most recent.

India's approach to virtual currencies:

- In 2018, the RBI issued a directive prohibiting banks from providing services to the cryptocurrency ecosystem.
- The Supreme Court of India overturned this decision, calling it disproportionate given that such currencies were not prohibited in the country.
- A cryptocurrency law - **the Cryptocurrency and Regulation of Official Digital Currency Bill, 2021** - that was supposed to be passed last year has yet to be enacted.
 - The bill seeks to prohibit all private cryptocurrencies in India.
 - However, it is expected to promote the underlying technology of cryptocurrency and its uses.
- Currently, there is no regulation or any ban on the use of cryptocurrencies in the country.
- In her 2022-23 Budget speech, the Finance Minister of India announced the launch of the Digital Rupee - a central bank digital currency (CBDC) - from 2022-23.

Background:

- According to the RBI, e-Rupee can be structured as **'token based' or 'account-based'**.
 - A token-based CBDC is a bearer instrument, similar to banknotes, which means that whoever owns the tokens at any particular time is believed to own them.
 - In contrast, an account-based system would necessitate the keeping of a record of all CBDC holders' balances and transactions, as well as indicating ownership of the monetary balances.
 - In a token-based CBDC, the individual receiving the token proves his ownership of the token is genuine, whereas an intermediary verifies the identity of an account holder in an account-based CBDC.
 - A token-based CBDC is preferred for CBDC-Retail since it is more similar to physical cash, but an account-based system can be considered for CBDC-Wholesale.
- The RBI is considering **two models for the issuance and management of CBDCs** - direct model (single tier model) and indirect model (two-tier model).
 - **In the direct model**, the central bank will be in charge of all aspects of the digital rupee system, including issuance, accounting and transaction verification.

- The central bank and other intermediaries (banks and other service providers) each play their respective roles under an indirect model.
- Here, the central bank will issue CBDC to consumers indirectly through intermediaries and any claim by consumers will be managed by the intermediary.

RBI's announcement and its significance:

- The RBI announced that the first pilot in the Digital Rupee or e-rupee in the wholesale segment will commence in G-Secs from November 1, 2022.
- The pilot will include 9 banks: State Bank of India, Bank of Baroda, Union Bank of India, HDFC Bank, ICICI Bank, Kotak Mahindra Bank, Yes Bank, IDFC First Bank and HSBC.
- According to the RBI, the use case for this pilot is settlement of secondary market transactions in G-Secs.
- The use case for this pilot is expected to make the interbank market more efficient.
- Settlement in central bank money lowers transaction costs by eliminating the requirement for settlement guarantee infrastructure or collateral to offset settlement risk.
- **Based on the learnings from this one**, a second pilot project on retail use of the digital rupee will begin in closed user groups within a month. Future pilots will concentrate on other wholesale transactions and cross-border payments.

DEOXYRIBONUCLEIC ACID (DNA)

Recently the Supreme Court has voiced concerns over the increasing use of DNA to prove cases.



About:

- **Deoxyribonucleic Acid (DNA)** is a set of instructions found in a cell.
- These instructions are used for the growth and development of an organism.
- The DNA of a person is unique, and variation in the sequence of DNA can be used to match individuals and identify them.

- DNA technology, therefore allows for accurate establishment of an individual's identity.
- In addition, DNA-based technology helps in identification of victims in the event of terrorist attacks or natural disasters such as earthquakes.
 - For example, DNA technology has been used to identify victims of terrorist attacks on the World Trade Centre in 2001, and disasters such as the Asian tsunami in 2004.
- Further, DNA profiling can be used in civil matters, such as parentage related disputes.

Precedents set by court:

- **Bhabani Prasad Jena, 2010 & Banarsi Dass, 2005:** Precedents set by the Supreme Court through the years show that judges cannot order genetic tests as a “roving enquiry” (Bhabani Prasad Jena, 2010) and they must balance “the interests of the parties” (Banarsi Dass, 2005).
- DNA tests should also not be ordered if there was other material evidence at hand to prove the case.
- **Ashok Kumar v. Raj Gupta 2021:** The court said judges, before ordering a genetic test, should examine “proportionality of the legitimate aims” being pursued.

DOCTRINE OF PLEASURE

Recently Kerala Governor has sought the dismissal of State's Finance Minister from his Cabinet, declaring that he has withdrawn the pleasure of having him in the Council of Ministers.



About:

- The pleasure doctrine is a concept derived from English common law, under which the crown can dispense with the services of anyone in its employ at any time.
- In India, **Article 310 of the Constitution** of India says every person in the defence or civil service of the Union holds office during the pleasure of the President, and every member of the civil service in the States holds office during the pleasure of the Governor.
- However, **Article 311** imposes restrictions on the removal of a civil servant.



CROSS & CLIMB ROHTAK



- It provides for civil servants being given a reasonable opportunity for a hearing on the charges against them.
 - There is also a provision to dispense with the inquiry if it is not practicable to hold one, or if it is not expedient to do so in the interest of national security.
 - In practical terms, the pleasure of the President referred to here is that of the Union government, and the Governor’s pleasure is that of the State government.
 - Under **Article 164**, the Chief Minister is appointed by the Governor; and the other Ministers are appointed by the Governor on the CM’s advice.
 - It adds that Ministers hold office during the pleasure of the Governor.
 - In a constitutional scheme in which they are appointed solely on the CM’s advice, the ‘pleasure’ referred to is also taken to mean the right of the Chief Minister to dismiss a Minister, and not that of the Governor.
 - In short, the Governor of an Indian State cannot remove a Minister on his own.
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