

**BIOTECHNOLOGY IN AGRICULTURE**

- ❖ **GM mustard**
- ❖ **CONEXT:** Recently, the Genetic Engineering Appraisal Committee (GEAC) under the Union Ministry of Environment, Forest and Climate Change recommended the “environmental release” of the transgenic hybrid mustard DMH-11 for seed production and conduct of field demonstration studies with respect to its effects, if any, on honey bees and other pollinating insects.
- ❖ **What exactly is hybrid mustard?**
  - Hybridisation 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.
  - 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. Since the eggs of one plant cannot be fertilised by the pollen grains from another, it limits the scope for developing hybrids — unlike in cotton, maize or tomato, where this can be done through simple emasculation or physical removal of anthers.
- ❖ **So, how has hybridisation been achieved in mustard?**
  - By genetic modification (GM), Scientists at Delhi University’s Centre for Genetic Manipulation of Crop Plants (CGMCP) have developed the hybrid mustard DMH-11 containing two alien genes isolated from a soil bacterium called *Bacillus amyloliquefaciens*.
  - The first gene (‘barnase’) codes for a protein that impairs pollen production and renders the plant into which it is incorporated male-sterile. This plant is then crossed with a fertile parental line containing, in turn, the second ‘barstar’ gene that blocks the action of the barnase gene. The resultant F1 progeny is both high-yielding and also capable of producing seed/ grain.
  - The CGMCP scientists have deployed the barnase-barstar GM technology to create what they say is a robust and viable hybridisation system in mustard. This system was used to develop DMH-11 by crossing a popular Indian mustard variety ‘Varuna’ (the barnase line) with an East European ‘Early Heera-2’ mutant (barstar).
  - DMH-11 is 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).
- ❖ **What has GEAC now done?**
  - GEAC is a body responsible for appraisal of proposals relating to the “release” of GM organisms and products (ordinarily considered hazardous) into the environment. In this case, it has recommended the environmental release of DMH-11 “for its seed production and testing, prior to commercial release”. In other words, it has given the green signal for commercial cultivation by farmers, with production of seed material being the first step.
  - GEAC has also recommended the environmental release of DMH-11’s parental lines (carrying the barnase and barstar genes) for them to be used to develop new hybrids. Such hybrids could give even higher yields than DMH-11.
  - 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’.
  - It can also introduce new traits relating to resistance against disease (alternaria blight and stem rot fungus) or canola oil quality (zero/ low levels of erucic acid and glucosinolates, seen as negative from a health standpoint).
- ❖ **Why did it take so long for GEAC to clear?**
  - There has been opposition to GM crops in general, from assorted green groups and the RSS-affiliate Swadeshi Jagran Manch.
  - In GM mustard, there have been **two specific concerns** voiced as well.
    - **The first** is the presence of a third ‘bar’ gene, which 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.
      - ✓ The DMH-11 developers, however, say that bar is only a marker gene. It is used to identify those plants that have been genetically modified — the non-GM ones cannot withstand application of the herbicide — and necessary for large-scale seed production.
      - ✓ The GEAC has recommended the “usage of any formulation of herbicide...exclusively for hybrid seed production”, while not permitting the same “for cultivation in the farmer’s field under any situation”.
    - **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.
      - ✓ However, the GEAC has cited the report of an expert committee, which stated that “based on the examination of scientific evidences available globally, it seems unlikely that the bar, barnase and barstar system will pose an adverse impact on honey bees and other pollinators”.

- ✓ The GEAC has, at the same time, recommended that the applicant (CGMCP) should conduct “field demonstration studies with respect to the effect of [GM mustard] on honey bees and other pollinators” post the environmental release, “to generate scientific evidence in Indian agro-climatic situation and as a precautionary mechanism”.
- ❖ **So, will Indian farmers finally plant GM mustard?**
- Since there are no seeds available and the planting season for the crop (October to early-November 2022) is virtually over.
- Also, it remains to be seen if the central government will accept the GEAC’s recommendations. The compelling motive here could be India’s spiraling edible oil import bill.
- The country produces only 8.5-9 million tonnes (mt) of edible oil annually, while importing 14-14.5 mt that entailed a record foreign exchange outgo of \$18.99 billion in the fiscal year ended March 31, 2022.

### CORPORATE GOVERNANCE

- ❖ **Competition Commission of India (CCI)**
- ❖ **CONTEXT:** The Competition Commission of India (CCI) recently imposed a Rs 936.44-crore penalty on the company for “abusing its dominant market position with respect to its Play Store policies”. This comes just days after the antitrust regulator imposed a penalty of Rs 1,338 crore on it for “abusing its dominant position in multiple categories related to Android mobile device ecosystem” in India.
- ❖ **What is CCI or the Competition Commission of India and what is its role?**
- The Competition Commission of India (within the Ministry of Corporate Affairs) has been established to enforce the competition law under the Competition Act, 2002.
- The recommendations of Raghavan committee, the Monopolies and Restrictive Trade Practices Act, 1969 (MRTP Act) was repealed and replaced by the Competition Act, 2002.
- The Commission consists of a Chairperson and not more than 6 Members appointed by the Central Government.
- It is the statutory duty of the Commission to eliminate practices having an adverse effect on competition, promote and sustain competition, protect the interests of consumers and ensure freedom of trade carried on by other participants, in markets in India as provided in the Preamble as well as Section 18 of the Act.
- The Commission is also mandated to give its opinion on competition issues to government or statutory authority and to undertake competition advocacy for creating awareness of competition law. Advocacy is at the core of effective competition regulation. Competition Commission of India (CCI), which has been entrusted with implementation of law, has always believed in complementing robust enforcement with facilitative advocacy. It is a quasi-judicial body.
- ❖ **What is the Competition Act?**
- The Competition Act, 2002, as amended by the Competition (Amendment) Act, 2007, follows the philosophy of modern competition laws. The Act prohibits anti-competitive agreements, and abuse of dominant position by enterprises and regulates combinations (acquisition, acquiring of control and M&A), which causes or likely to cause an appreciable adverse effect on competition within India.
- In accordance with the provisions of the Amendment Act, the Competition Commission of India and the Competition Appellate Tribunal have been established.
- The government of India replaced Competition Appellate Tribunal (COMPAT) with the National Company Law Appellate Tribunal (NCLAT) in 2017.
- The provisions of the Competition Act relating to anti-competitive agreements and abuse of dominant position were notified on May 20, 2009.
- ❖ **What is the vision and mission of CCI?**
- **VISION** —To promote and sustain an enabling competition culture through engagement and enforcement that would inspire businesses to be fair, competitive and innovative; enhance consumer welfare; and support economic growth.
- **MISSION**— Competition Commission of India aims to establish a robust competitive environment through:
  - ✓ Proactive engagement with all stakeholders, including consumers, industry, government and international jurisdictions.
  - ✓ Being a knowledge-intensive organization with high competence level.
  - ✓ Professionalism, transparency, resolve and wisdom in enforcement.
- ❖ **Antitrust**
- The Competition Act, 2002 (as amended) follows the philosophy of modern competition laws and aims at fostering competition and at protecting Indian markets against anti-competitive practices by enterprises.

- The Act prohibits anti-competitive agreements, and abuse of dominant position by enterprises, and regulates combinations (mergers, amalgamations and acquisitions) with a view to ensure that there is no adverse effect on competition in India. The Act prohibits any agreement which causes, or is likely to cause, an appreciable adverse effect on competition in markets in India. Any such agreement is void.
- An agreement may be horizontal i.e. between enterprises, persons, associations, etc. engaged in identical or similar trade of goods or provision of services, or it may be vertical i.e. amongst enterprises or persons at different stages or levels of the production chain in different markets.
- Cartelisation is one of the horizontal agreements that shall be presumed to have appreciable adverse effect on competition under Section 3 of the Act.
- ❖ **Cartelisation**
- According to CCI, a “Cartel includes an association of producers, sellers, distributors, traders or service providers who, by agreement amongst themselves, limit, control or attempt to control the production, distribution, sale or price of, or, trade in goods or provision of services”.
- The International Competition Network, which is a global body dedicated to enforcing competition law, has a simpler definition. The three common components of a cartel are:
  - an agreement;
  - between competitors;
  - to restrict competition.
- “The agreement that forms a cartel need not be formal or written. Cartels almost invariably involve secret conspiracies. The term competitors most often refers to companies at the same level of the economy (manufacturers, distributors, or retailers) in direct competition with each other to sell goods or provide services. The aspect of a restriction on competition distinguishes conduct that targets open competition from benign, ordinary course of business agreements between firms.
- ❖ **Why ‘competition’ is needed?**
- According to CCI, Competition is the best means of ensuring that the ‘Common Man’ or ‘Aam Aadmi’ has access to the broadest range of goods and services at the most competitive prices. With increased competition, producers will have maximum incentive to innovate and specialize. This would result in reduced costs and wider choice to consumers. A fair competition in market is essential to achieve this objective. Our goal is to create and sustain fair competition in the economy that will provide a ‘level playing field’ to the producers and make the markets work for the welfare of the consumers.
- ❖ **What is the major challenge ahead for the Competition Commission of India in the digital era?**
- CCI needs to revisit its definition of ‘relevant market’. In the age of digital world, defining relevant market has been a tough task for regulators world-wide. Technological developments like Web 3.0, AI, IoT, Blockchain and issues like data protection and privacy, search bias, platform neutrality, confidentiality, etc, have created a need for a robust competition law. Such a law should meet the demands of the technological era we live in.

### PRELIMS

#### 1. **Jal Jeevan Mission**

- ❖ **CONTEXT:** The Gujarat government recently announced that it has achieved 100 per cent household water connections under the Centre’s Jal Jeevan Mission(JJM).
- The mission Launched in 2019, it envisages supply of 55 litres of water per person per day to every rural household through Functional Household Tap Connections (FHTC) by 2024.
- JJM looks to create a jan andolan for water, thereby making it everyone’s priority.
- It comes under Jal Shakti Ministry.
- Aims: The mission ensures functionality of existing water supply systems and water connections, water quality monitoring and testing as well as sustainable agriculture. It also ensures conjunctive use of conserved water; drinking water source augmentation, drinking water supply system, grey water treatment and its reuse.
- Features:
  - JJM focuses on integrated demand and supply-side management of water at the local level.
  - Creation of local infrastructure for source sustainability measures as mandatory elements, like rainwater harvesting, groundwater recharge and management of household wastewater for reuse, is undertaken in convergence with other government programmes/schemes.
  - The Mission is based on a community approach to water and includes extensive Information, Education and Communication as a key component of the mission.
- Implementation: Paani Samitis plan, implement, manage, operate and maintain village water supply systems. These consist of 10-15 members, with at least 50% women members and other members from Self-Help Groups, Accredited Social and Health Workers, Anganwadi teachers, etc. The

committees prepare a one-time village action plan, merging all available village resources. The plan is approved in a Gram Sabha before implementation.

- Funding Pattern: The fund sharing pattern between the Centre and states is 90:10 for Himalayan and North-Eastern States, 50:50 for other states, and 100% for Union Territories.
- ❖ **What has been the JJM's Performance so far?**
- As per the JJM dashboard, around 9.65 crore households (50.38%) have tap water connections across the nation as of 10<sup>th</sup> June, 2022.
- At the State level, Goa, Telangana and Haryana have achieved 100% tap connectivity to all households in the State.
- Union territories like Puducherry, the Andaman and Nicobar Islands, Dadra & Nagar Haveli and Daman & Diu have also provided 100 % of their households with tap water connections.
- States with over 90 % FHTC (Functional Household toilet coverage) coverage are (approximate figures are in brackets) – Punjab at 99.72 %, Gujarat at 95.91 % , Himachal Pradesh at 93.05% and Bihar at 92.74%.
- States with the least FHTC coverage are — Rajasthan at 24.87 % , Chhattisgarh at 23.10 % , Jharkhand at 20.57% and Uttar Pradesh at 13.86%.

## 2. Bats evicted from Manipur cave for tourism, says study

❖ **CONTEXT: A colony of bats was evicted from a Manipur cave system with a Palaeolithic past to make it tourist-friendly, a zoological study that recorded new fauna in the State has said.**

- The Khangkhui, locally called Khangkhui Mangsor, is a natural limestone cave in Ukhrul district of Manipur. Excavations carried out by Manipur's archaeologists had revealed the cave was home to Stone Age communities.
- The cave was also used as a shelter by the local people during the Second World War after the Japanese forces advanced to Manipur and the adjoining Nagaland. More importantly for conservationists, the cave housed large roosting populations of bats belonging to the Rhinolophidae and Hipposideridae families.
- A study published in the Journal of Threatened Taxa by researchers from the Zoological Survey of India (ZSI) cited local guides as saying that the bats were killed and evicted from the Khangkhui cave after 2016-17 purportedly to make it "more tourist-friendly".
- The researchers recorded Blyth's horseshoe bat in the Khangkhui cave during two extensive field surveys covering nine districts of Manipur in 2019 and 2021.
- This bat was one of 12 new species added to Manipur's mammalian fauna. The others included the ashy roundleaf bat, the intermediate horseshoe bat, the northern woolly horseshoe bat, the greater false vampire bat, the hairy-faced bat, Hodgson's bat, Hutton's tube-nosed bat and the round-eared tube-nosed bat.
- The study mentions places in Manipur where bats are eaten for "supposed medicinal properties or as a supplementary source of protein".
- Another serious threat we noticed is the death of bats as unintended victims of illegal bird traps.

## 3. Mangarh Dham

❖ **CONTEXT: Rajasthan Chief Minister Ashok Gehlot has sought the declaration of the memorial for tribals as a monument of national importance. Mangarh Dham is known for the massacre of tribals by the British Indian Army in 1913**

❖ **Mangarh Hillock**

- The hillock, situated at the Gujarat-Rajasthan border, is a site of a tribal uprising where a massacre of over 1500 Bhil tribal freedom fighters took place in 1913.
- Bhil social reformer and spiritual leader Govind Guru first raised the demand for a separate state for tribals back in 1913 after the Mangarh massacre.
- The place is also known as the Adivasi Jallianwala, and there has been a demand to build a memorial.

❖ **Bhil tribe**

- The word Bhil is derived from "Veel", which means "bow" in the Dravidian language.
- The Bhil tribe is called "Dhanush Purush of India" because they are highly adept at learning Dhanush.
- They are a group of tribal Indians scattered throughout India from Gujarat in the west to Tripura in the Far East. They have a rich and unique culture.
- Ghoomar is a traditional folk dance of the Bhil tribe.
  - Ghoomar is the symbol of femininity.
  - The young women take part in this dance and declare that they are stepping into women's shoes.

❖ **Monument of national importance**

- Monuments of National Importance are designated by the Archaeological Survey of India (ASI).
- 'Ancient Monument' is defined under the Ancient Monument and Archaeological Sites and Remains Act, 1958. The Act defines Ancient Monument as any structure or monument or any cave, rock-sculpture,

an inscription that is of historical, archaeological interest. Further, Ancient Monument has to be in existence for not less than 100 years.

- The Central Government is authorised to maintain, protect and promote the Monuments of National Importance.
- Currently, 3,691 monuments nationwide are protected by the Archaeological Survey of India(ASI). The highest number of them were in Uttar Pradesh followed by Karnataka and Tamil Nadu.

### ANSWER WRITING

#### Q. What are suicide drones? How are they changing traditional warfare?

##### Introduction:

- Suicide drones are single-use weapons that fly into their targets and detonate on impact, they are capable of circling above a target and waiting for the perfect moment to strike with incredible precision.

Israel, U.S.A, South Korea and China are some of the leading producers of this type of drones. Recently, these suicide drones were used by various countries like Azerbaijan had used small Turkish-made drones against the Armenian military, Ukraine and Russia used them against each other.

- Significance of suicide drones in changing traditional warfare:
  - Cover Long Range:
    - Like cruise missiles, suicide drones can hit targets hundreds of kilometers away, but cruise missiles are expensive, and suicide drones are a cheaper, yet precise,
  - Portable: It is easy to handle and designed to be carried in a backpack, assisting small infantry units.
  - Better Camouflage: It has the capability of going past traditional defenses to strike its targets.
  - Advance electronics: It's difficult to detect on radar, and they can even be programmed to hit targets without human intervention, based on facial recognition.

##### Conclusion

Given the rapid development of capabilities, steadily dropping cost, and wide proliferation, it is all but certain that drones will be used in all future conflicts and will be leveraged even by least developed countries or non-state actors as a tool to achieve their objectives.

### MCQs

1. With reference to Govind Giri who was often mentioned in news recently consider the following statements

1. Govind Giri started Bhagat movement in 1908
2. He first raised the demand for a separate state for tribals after the Mangarh massacre

Choose the correct statement using the codes given below

- a) 1 only
- b) 2 only
- c) **Both 1 and 2**
- d) Neither 1 nor 2

2. Consider the following statements:

Bats can fly in the dark because

1. They have better vision in the dark.
2. The pupils of their eyes are very big.
3. They are guided by ultrasonic waves produced by them.

Which of the above statements is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) **3 only**
- d) 2 only

3. Consider the following statements regarding Jal Jeevan Mission.

1. It aims to provide piped drinking water to all rural households by 2024.
2. It aims to provide 25 litres of tapped water per person per day to all households by 2024.
3. Goa has become the first 'Har Ghar Jal State' to provide 100% household tap connections in rural areas.
4. The Jal Shakti Ministry is the nodal ministry for the implementation of the scheme.

Which of the statements given above is/are correct?

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

4. Consider the following statements

1. National Monument Authority is a subordinate office to Archaeological Survey of India.

2. Alexander Cunningham is known as the "Father of Indian Archaeology".
3. Monuments of National Importance are designated by the Archaeological Survey of India (ASI)

Which of the above statement/s is/are correct?

- a) 1 and 2 only
- b) 1 only**
- c) 2 and 3 only
- d) 2 only

5. Consider the following statements about the Genetic Engineering Appraisal Committee:

1. It is a statutory body under the Ministry of Science & Technology.
2. It approves activities involving large-scale use of hazardous microorganisms in research and industrial production.
3. It is responsible for the approval of proposals relating to the release of genetically engineered organisms.

Which of the statements given above is/are correct?

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

6. The Genetic Engineering Appraisal Committee is constituted under the:

- a) Food Safety and Standards Act, 2006
- b) Geographical Indications of Goods (Registration and Protection) Act, 1999
- c) Environment (protection) Act, 1986**
- d) Wildlife (Protection) Act, 1972

7. Consider the following statements regarding Genetically Modified mustard (GM Mustard) developed in India.

1. GM mustard has the genes of a soil bacterium that give 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 following statements given above is/are correct?

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

8. Consider the following statements about National Company Law Appellate Tribunal (NCLAT):

1. It is a quasi-judicial body established under the Companies Act 2013
2. An appeal against the orders passed by NCLT can be made only in Supreme Court.

Which of the above statements is/are correct?

- a) 1 only**
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

9. With reference to competition commission of India consider the following statements

1. It has been established under Companies Act 2013
2. It act as a quasi judicial body
3. Its decision is final and binding on both the parties, and its decision cannot be questioned in court of law
4. It functions under Ministry of Commerce and Industry

Which of the above statement/s is/are not correct?

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

10. Khangkhui Mangsor cave recently seen in news is situated in which of the following state?

- a) Nagaland
- b) Manipur**
- c) Assam
- d) Mizoram