Genetically Modified Seeds

Why in News

Recently, Shetkari Sanghatana, a Maharashtra based farmers' union body has announced agitation for use of unapproved genetically modified seeds of cotton, maize, rice, mustard, soybean and brinjal.

- Shetkari Sanghatana is a big supporter of GM seeds. Its main aim is to provide farmers, freedom of access to markets and technology.
- Last year its members had broken the law by planting Herbicide Tolerant Bt cotton seeds. This year too it's members are planning to repeat the same.

Key Points

- **Genetically Modified Seeds:**
  - Conventional plant breeding involves **crossing species of the same genus** to provide the offspring with the desired traits of both parents.

    Genus is a class of items such as a group of animals or plants with similar traits, qualities or features.
  - **Genetic modification** aims to transcend the genus barrier by **introducing an alien gene** in the seeds to get the desired effects. The alien gene could be from a plant, an animal or even a soil bacterium.
    - **Bt cotton** is the **only Genetically Modified (GM) crop** that is allowed in India. It has **alien genes from the soil bacterium Bacillus thuringiensis (Bt)** that allows the crop to develop a protein toxic to the common **pest pink bollworm.**
    - **Herbicide Tolerant Bt (Ht Bt) cotton,** on the other hand is derived with the insertion of an additional gene, from another soil bacterium, which allows the plant to resist the common **herbicide glyphosate.**
    - In **Bt brinjal**, a gene allows the plant to resist attacks of fruit and shoot borers.
    - In **DMH-11 mustard**, genetic modification allows cross-pollination in a crop that self-pollinates in nature.
- **Legal Position of GM crops in India**
  - In India, the **Genetic Engineering Appraisal Committee (GEAC)** is the apex body that allows for commercial release of GM crops.

    In 2002, the GEAC had allowed the commercial release of Bt cotton. More than 95% of the country's cotton area has since then come under Bt cotton.
  - Use of the unapproved GM variant can attract **a jail term of 5 years and fine of Rs. 1 lakh** under the Environment Protection Act, 1986.
- **Farmers Demand for GM Seeds:**

  GM seeds reduce the production cost and increase productivity.
  - Ht Bt cotton reduces the high cost of weeding.
  - Bt brinjal reduces the use of pesticides.

- **Issues involved:** Genetic modification brings about changes that can be harmful to humans in the long run. The long-lasting effect of GM crops is yet to be studied. Some of the issues involved are:
    - **Threat to Biodiversity:**
        - Cross-pollination in GM crops paves the way for **herbicide-resistant superweeds** that can further threaten the sustenance of other crops and pests because of their uncontrolled growth. In short, biodiversity gets threatened.
        - GM crops because of their pest resistance characteristics could **eliminate important species of pests** that are responsible for sustaining domestic varieties and can pose serious threats to biodiversity. They Can **affect the food chain** also.
    - **Nutrition issues:**
        Bt brinjal poses risks to human health as its **resistance to antibiotics** can turn medicines ineffective and may result in the formation of new toxins and allergens.
    - **Implications for consumers and farmers:**
        It is claimed that patent laws give developers of the GM crops a dangerous degree of **control/dominance over the food supply** that results in the over domination of world food production by a few companies.

Way Forward

- **Environmental impact assessment** should be carried out by independent environmentalists, as farmers do not and cannot assess the long-term impact of GM crops on ecology and health.
- Ensure that an **unapproved variety of GM seeds is not available in markets.**
- In order to curb the illegal cultivation of GM seeds, the **Genetic Engineering Appraisal Committee** (GEAC) should:
    - Collaborate with state governments and launch a nation-wide investigation drive.
    - Take action on threats of deliberate GM crop cultivation.
    - Investigate and prosecute those involved in the illegal supply of GM Seeds.
    - Encourage organic farming.
- The government should go for commercialization of GM seeds only after the core and deep research on the long term prospects and benefits of commercialization of GM seeds in India.

Source: IE