

02– 09 – 2024

News: Natural Farming

- Recently, the "Regional Consultation Program on the Science of Natural Farming" emphasised the importance of natural farming as a sustainable agricultural practice.
- It was announced that farmers who practise natural farming on a portion of their land for 3 years will be eligible for government subsidies.

Natural Farming

- Natural Farming is an agricultural practice that emphasises minimal intervention and the use of natural resources to cultivate crops.
- It seeks to enhance soil health, biodiversity, and ecosystem balance without relying on synthetic fertilisers, pesticides, or herbicides.
- It is largely based on on-farm biomass recycling with major stress on biomass mulching, use of on-farm cow dung-urine formulations; maintaining soil aeration and exclusion of all synthetic chemical inputs.

Aims and Objectives

- Preserve natural flora and fauna
- Restore soil health and fertility
- Maintain diversity in crop production
- Efficient utilisation of land and natural resources
- Promote natural beneficial insects, animals, and microbes
- Promotion of local breeds for livestock integration
- Use of natural/local resource-based inputs
- Reduce input cost of agricultural production
- Improve economics of farmers

Components



Current Scenario

- Several states, including Andhra Pradesh, Gujarat, Himachal Pradesh, Odisha, Madhya Pradesh, Rajasthan, Uttar Pradesh, and Tamil Nadu, have initiated programs to promote natural farming.
- Currently, over 10 lakh hectares of land in India are being used for natural farming.
- Recently, it was announced that farmers who practise natural farming on a portion of their land for 3 years will be eligible for government subsidies.

Difference with Organic farming

Organic Farming	Natural Farming
Organic fertilizers and manures like compost, vermin-compost and cow dung manure are used and added to farmlands from external sources.	In natural farming, neither chemical nor organic fertilizers are added to the soil. In fact, no external nutrient sources added to soil.
Organic farming is still expensive due to the requirement of bulk manures, and it has an ecological impact.	It is an extremely low-cost farming method, completely moulding with local on biodiversity surrounding environments.
In organic farming the manures and composts are to be incorporated into the soil for their proper decomposition and this requires more effort and cost.	In natural farming, decomposition of organic matter by microbes and earthworms is encouraged right on the soil surface itself, which gradually adds nutrition in the soil, over the years.
Organic farming has a slight adverse effect on the surrounding environment as it involves intervening with the natural processes.	Natural farming practice does not have any effect on the surrounding environment and it confirms with local processes of biodiversity.
Guidelines & regulations to be followed for certification purpose.	Less regulated.

News: Chandipura virus (CHPV)

- Recently, many children have died of suspected Chandipura virus (CHPV) infection in Gujarat.

Chandipura Virus

- Chandipura virus was discovered in 1965 in Chandipura village of Maharashtra during a dengue outbreak.
- The Chandipura Vesiculovirus (CHPV) predominantly affects the children below 15 years of age.
- Virus spreads mainly through the bite of sandflies and sometimes through mosquitoes.
- The virus resides in the salivary glands of these insects and is transmitted through their bites. CHPV can infect the central nervous system, potentially leading to encephalitis, an inflammation of the brain's active tissues.
- Symptoms resemble flu, including fever, body aches, and headache. It can cause altered mental state, seizures, encephalitis, respiratory distress, bleeding tendencies, and anaemia in advanced stages.
- Cases are mostly reported in monsoon and pre-monsoon period, where sandflies breed.

- Currently, there is no specific antiviral treatment or vaccine for CHPV, so care is supportive and symptomatic.
- The infection remains endemic in central India, especially in rural and tribal areas with higher sandfly populations.
- News: Nipah Virus
- There was a recent nipah outbreak in Kerala.

Nipah Virus

- Nipah is a zoonotic virus (it is transmitted from animals to humans).
- The organism which causes Nipah Virus encephalitis is an RNA or Ribonucleic acid virus of the family Paramyxoviridae, genus Henipavirus, and is closely related to Hendra virus.
- It first broke out in Malaysia and Singapore in 1998 and 1999.
- It first appeared in domestic pigs and has been found among several species of domestic animals including dogs, cats, goats, horses and sheep.

Transmission

- The disease spreads through fruit bats or 'flying foxes,' of the genus Pteropus, who are natural reservoir hosts of the Nipah and Hendra viruses.

- The virus is present in bat urine and potentially, bat faeces, saliva, and birthing fluids.

Symptoms

- The human infection presents as an encephalitic syndrome marked by fever, headache, drowsiness, disorientation, mental confusion, coma, and potentially death.

Prevention

- Currently, there are no vaccines for both humans and animals. Intensive supportive care is given to humans infected by Nipah virus.

News: GM Mustard

- Recently, the **Supreme Court (SC)** delivered a split verdict on the validity of the Centre's decision to grant conditional approval for the environmental release of Genetically Modified (GM) DMH – 11 Mustard varieties. Now, the case will be referred to a Supreme Court's three-judge Bench.

Key Highlights of SC Verdict on GM Mustard

Reason behind Split Judgement

- Justice Nagarathna criticised the GEAC for clearing the project without relying on any indigenous studies on the crop's effect in India and its possible environmental ramifications and only foreign research studies were considered while making the recommendation.
- In contrast, Justice Karol upheld the GEAC's clearance for GM mustard's commercial release.
- However, both judges concurred on certain points raised during the arguments.
- They acknowledged that judicial review of decisions made by the GEAC was permissible and emphasised the need for the Centre to consider implementing a national policy.

DMH – 11

- Dhara Mustard Hybrid – 11 (DMH–11) is a hybrid variant of mustard developed by researchers at The Centre for Genetic Manipulation of Crop Plants, at the University of Delhi.
- The University of Delhi authorities asserted that DMH – 11 was developed without transgenic technology.
- DMH – 11 is a result of a cross between two varieties: Varuna and Early Heera–2.
- Such a cross wouldn't have happened naturally and was done after introducing genes from two soil bacterium called barnase and barstar.
- Barnase in Varuna induces a temporary sterility because of which it can't naturally self-pollinate. Barstar in Heera blocks the effect of barnase allowing seeds to be produced.
- The result is DMH 11 (where 11 refer to the number of generations after which desirable traits manifest) that not only has better yield but is also fertile.
- DMH–11 is a transgenic crop because it uses foreign genes from a different species.
- The Genetic Engineering Approval Committee (GEAC) has approved the environmental release of DMH–11 variety of Mustard in October 2022.

Benefits of GM Mustard

- Indigenously developed seeds, the **patent remains with government** unlike with cotton it remains with corporates.
- India Plans for **food fortification** to achieve SDG, this will help to achieving its goal.
- Yields are expected to **rise by up to 30 per cent**.
- India imports 15 million tonnes (Mt) of edible oils worth almost \$11 billion annually, **Mustard oil production from this variety of crop will save a lot on Foreign exchange exchequer**.
- The **GEAC initially cleared DMH - 11 for commercial cultivation, however, they retracted their approval upon deciding that more tests**, and additional data concerning the **effect of DMH - 11 on insect pollinators, in particular honeybees**, and on soil microbial diversity was needed prior to commercialisation.

Reason for the controversy behind GM Mustard

- There are **two main reasons why transgenic mustards are a topic of debate**.
- The **use of genes that are foreign to the species** is one and secondly, the **preparation of mustard hybrids require the use of another gene, called the bar gene, that makes it tolerant to an herbicide called glufosinate–ammonium**.

- Activist groups allege that the GM mustard hasn't been evaluated as an herbicide tolerant crop posing potential risks. Finally, they allege, **GM mustard plants may dissuade bees from pollinating the plant and this could have knock-off environmental catastrophes.**

Genetically Modified Crops (GM Crops)

- 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.
- 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.**
- Advantages of GM Crops include Higher Yields, Enhanced nutritional value, Longer shelf life, Increased resistance to droughts, Increased resistance to insects, pests & locusts and increased resistance to herbicides.

- Disadvantages of GM crops are it may cause allergies, Antimicrobial resistance and may lead to Cancer.

Genetic Engineering Appraisal Committee (GEAC)

- Genetic Engineering Appraisal Committee (GEAC) is constituted under the **Rules for the Manufacture, Use/Import/ Export and Storage of Hazardous Microorganisms/ Genetically Engineering Organisms or Cells, 1989.**
- It was formed as **Genetic Engineering Approval Committee** and was renamed to **its current name in 2010.**
- GEAC works under **Ministry of Environment, Forest and Climate Change (MoEFCC).**
- It is the **Ministry of Environment** who makes the final decision on approving the GM Crops.
- 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.**
- It is GEAC who **assesses proposals regarding the release of Genetically Engineered products** and organisms to the environment and this includes experimental trials as well.

- GEAC includes a Chairman who is a Special secretary or Additional Secretary to MoEFCC, a Co-chairman who is a Representative of Dept. of Biotechnology and as many other members who meet every month to review the applications in the Committee purview.