



Hybrid Seeds

For Prelims: Hybrid Seeds, Open-Pollinated Variety (OPV) Seeds, [Food and Agricultural Organization \(FAO\)](#), [Crop Diversity](#).

For Mains: Hybrid Seeds, their advantages and concerns pertaining to Agriculture.

Source: DTE

Why in News?

Popularity of Hybrid Seeds has been increasing among farmers in India over a decades due to their quicker harvesting as compared to traditional or **Open-Pollinated Variety (OPV)** seeds.

- OPV are usually **more genetically diverse, causing** an amazing variation within plant populations, which ultimately allows them to **adapt to local growing conditions and climates every year.**

What are the Hybrid Seeds?

▪ About:

- A hybrid seed is produced by **controlled Cross-Pollination** between **different varieties** of the same plant.
 - The transfer of pollen grains from the anther of one plant to the stigma of another different plant is called cross-pollination.
- These are **chosen to enhance the characteristics** of the resulting plants including - better yield, greater uniformity, and disease resistance.
- Since all hybrid seeds in a packet have the same parent plants, which means they will all grow into uniform plants.
- These are **often easier and faster to grow** than Heirloom Seeds.
 - **Heirloom Seeds** come from **open-pollinated plants**, meaning the plants were pollinated by natural mechanisms like wind, insects, or birds, rather than through controlled cross-breeding or hybridization.

▪ Benefits:

- Farmers can improve their yields and predict fruit maturity through its various benefits, such as **drought resilience, pests resistance**, and rapid improvement in breeding.
- The advent of hybrid seeds, use of quality seeds, mechanization, and advanced technology have entirely reshaped the **agriculture scenario altogether**, which resulted in **enhanced farmers' income as well as the production of all sown crops**, leading the government to promote hybrid and high yielding varieties of seeds.

▪ Need:

- The rapid increase in population is impelling farmers to **adopt hybrid seeds and enhance production.**
- Hybridisation aims to improve the grain qualities, reduce pests incidence and increase the overall crop productivity, contributing to sustainable development goals of food security and nutrition.

- This potential for adaptation and genetic improvement, driven by plant breeding, **can help in addressing the current challenges.**
- **Origin:**
 - The origin of hybrids can be traced to [India's Green Revolution in the 1960s](#), when the government's effort was primarily to increase agricultural productivity. For this, the **National Seed Corporation** was set up in 1963 to develop, store and distribute high yield variety seeds.
- **Market Status in India:**
 - According to a report of the Standing Committee on Agriculture in 2021, the **share of the private sector in India's seed market increased from 57.3% in 2017-18 to 64.5% in 2020-21.**
 - A 2019 report by Indian Council of Food and Agriculture, the Indian seed market reached a value of USD 4.1 billion in 2018 and is expected to grow at a rate of 13.6% from 2019-24, reaching a value of USD 9.1 billion by 2024.
 - Hybrid seeds **occupy about 6% of India's 44 million hectares** under rice cultivation.
 - Hybrid seeds for paddy (rice) are the primary type of hybrid seeds available in India, occupying about 6% of the rice cultivation area.
 - The majority of India's seed market is **occupied by wheat and paddy (rice), accounting for about 85%** of the seed market.

What are the Concerns of Adopting Hybrid Seeds?

- **Impact on Crop Diversity:**
 - Hybrid seeds are **sensitive to temperature and rain**, posing a threat to India's crop diversity.
 - Unlike traditional varieties that adapt to local climates, **hybrids require specific conditions** for optimal growth.
 - For instance, a hybrid variety of paddy requires rainfall within 15-20 of sowing.
- **Concerns and Crop Failures:**
 - Farmers have reported **cases of crop failure and reduced yield** with hybrid varieties, particularly in maize. Hybrid seeds are also more susceptible to infections, affecting the yield.
 - In 2022, a farmer in Haryana, experienced a significant **drop in rice yield due to a Fiji virus infection.**
- **Price Hikes and Availability:**
 - Manufacturers tend to increase prices of hybrid seeds with rising demand. Farmers sometimes feel **forced to buy hybrids due to limited availability** of traditional seeds, especially from government seed banks.
 - Manufacturers of hybrid seeds also tend to **hike prices when the demand rises.**
- **Decline in Traditional Varieties:**
 - The dominance of hybrid seeds has **led to a decline in traditional and local varieties** of crops. This decline threatens the diversity of crops and their resilience to adverse conditions.
- **Genetic Erosion and Crop Replacement:**
 - The shift towards hybrid seeds and modern uniform varieties has led to genetic erosion, **replacing indigenous crop varieties.** This narrow genetic range is focused on profit rather than preserving the extensive diversity of local species.

Way Forward

- There is a need to Invest in **research to develop hybrid seeds that are resilient to varied climates** and less susceptible to infections. This ensures a higher yield without compromising on crop diversity.
- It is imperative to encourage farmers to continue cultivating traditional and local varieties by providing incentives, technical support, and creating markets for these crops.
- There is a need to facilitate **partnerships between the government and private sector to encourage the development of hybrid seeds** that align with sustainable agriculture practices and local climate conditions.

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