High Yield Crops (HYVs)

Overview, Evolution, Importance and the Green Revolution | UPSC Economy Notes

High Yield Crops (HYVs) are simply those that have been fertilised or genetically changed using biotechnological techniques to increase their rate of production. This improves the input materials' efficiency, which raises the productivity of the agricultural output and, eventually, raises the farmers' per-capita income. One of the key elements in determining the success of India's Green Revolution in the second half of the 20th century was the high-yield variety of crops. Therefore, High Yield Crops are one of the most important topics for the UPSC IAS Examination.

In this article on High Yield Crops, we shall discuss its overview, basic details and importance in detail. This will be very useful for aspirants in the UPSC Prelims Exam.

Also, study the Types of Crops in India from the linked article.

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Overview of the High Yield Crops

- Crops that have been bred or fertilized and can be produced by genetic modifications to increase the rate of production are known as H**igh Yield Crops**.
- In 1966, the high-yielding programme was launched in some areas of India for the first time during the Kharif season of that year.
- These crops are resistant to any diseases or insects which can affect the normal variety of crops.
- Therefore they offer improved quality and productivity to the farmers.
- On a general basis, they are also resistant to drought and floods thereby enhancing their building capacity.
- The most important **High Yield Crops (HYVs)** can be found in **wheat, corn, soybean, rice, potato, and cotton**.
- They are heavily used in commercial and plantation farms.
- HYVs become popular in the 1960s and play an important role in the Green Revolution, although their ancestral roots can be older.

Alos, check out the Kisan vikas patra scheme here.

Evolution of the High Yield Crops

- **Inter cropping is a method of crop production which ensures high yield crops**. It is a practice of growing two or more crops simultaneously in the same field in rows
- When the effect of industrialisation and globalisation spread in India, more and more people from the rural areas of India went to the urban areas in order to look for improved employment opportunities.
- This was also supported by the fact that as technology in the agriculture sector improved because of globalisation and industrialisation, less number of people were required to obtain the same amount of efficiency in the agricultural fields.
- However, when the lead was felt to enhance the agricultural productivity of India in order to reduce the import dependence on nations like the USA for crystal grains the government of India handed emphasis on initiatives like the Green Revolution.
- This was also supported by the efforts of various state governments like Punjab.
- In this endeavour, Institutions like GB Pant Agricultural University of Pantnagar, Indian Council of Agricultural Research and Punjab Agricultural University associated in Ludhiana also give their efforts to enhance the productivity of the crops by enhancing their building capacity.
- Therefore based on the combined efforts of various stakeholders a high-yielding variety of crops were introduced in India which had better resistance to insecticides and also to natural disasters like floods and droughts.
- This automatically increases the productivity of these high-yielding crop types, hence increasing India's grain production capacity and raising farmers' per capita income.

Study about Crop Diversification here.

Significance of the High Yield Crops (HYVs)

- High Yield variety of crops improves productivity for the same amount of labour.
- The high yield crops for small farms have helped farmers without land or with a little piece of land.
- They also offer better resistance against natural disasters like floods and droughts thereby enhancing the income prospects of the farmers. The green revolution has also indirectly led to women's empowerment.
- As more and more women have employed themselves in the agricultural fields because of the enhanced productivity of the high-yield variety of crops.
- This has improved the social status of women, particularly in the rural areas where investments in social sectors like health, education, station, housing and water conservation have also improved on a gradual basis.

Issues associated with the High Yield Crops

- These crops require the usage of more water as compared to the normal variety of crops.
- These also require the regular use of pesticides and regular reading of the agricultural fields
- These crops as compared to the normal varieties are sometimes more susceptible to some diseases of the crops.
- Therefore the efficient and national usage of the high-yield variety of crops under the supervision of competent authorities is very necessary in order to obtain the maximum benefit out of these varieties.

Study about the PM-Kisan Samman Nidhi Yojna here.

Advantages of High Yielding Variety Seeds

- The goal of High Yielding Variety seed distribution is to increase the production of high-yielding food crops.
- HYVs are at the heart of current farm technology, owing mostly to enhanced production.
- The primary benefits of High Yielding Farm yield with the use of HYV seeds are higher than with the use of standard seeds.
- HYV seeds produce higher quality yields.
- Crop maturity time is short. Multiple crops may be simply cultivated.
- The majority of seeds are flood and drought-tolerant.
- Pest and disease problems are less prevalent. HYV seeds provide more jobs.
- Crops with a high yield mature in a shorter period of time. As a result, some more crops can be grown in the spare time spared.
- High-yielding crop cultivars respond well to fertilizers. This indicates that when high-producing types are fed fertilizer, their yield increases significantly. This is not true for traditional varieties.
- Crop cultivars with large yields are dwarf. Because of their small height, their plants are more demanding and can survive high winds. These enhanced types have less of a lodging problem.

Role and Adverse Effects of using High Yielding Varieties of Seeds

- The main drawback of HYV seeds is that they require more irrigation infrastructure, chemical fertilizers, and pesticides to generate the highest quality yield.
- High Yielding Variety Seeds (HYV) have a shorter life cycle, allowing farmers to plant numerous crops at once.
- The majority of HYV seeds are dwarf cultivars. They require larger fertilizer dosages. Pests are a major concern for HYV crops. To solve this problem, the appropriate amount of insecticides should be utilized.
- Farmers in unirrigated areas were unable to effectively adopt the new seeds, and as a result, they are in abject poverty, suffering from malnutrition and deficiency disorders.
- As a result, the economic disparity between farmers living in various geo-climatic situations has widened.
- Because the new seedlings perform better under controlled and ensured irrigation, they bypass those who work on unirrigated soils.
- The problem of interregional inequality may worsen since sufficient programs for the country's rainfed and drought-prone areas have not been implemented.
- Apart from interregional disparities, the HYV has caused intraregional disparities in agricultural revenues among farmers residing in the same village.

Green Revolution

- In 1940 Richard Bradley called India a "beggar bowl" because of its heavy import dependence on food grains from the United States.
- William Gadd used the term "Green Revolution" for the first time in 1968 at a symposium entitled "Food Crisis in Third World Countries" in Washington DC.

- Green Revolution refers to multiple increases in crop production in third-world countries based on the use of modern inputs, technologies, HYVs, agricultural mechanization and irrigation facilities.
- It reflects the agro-economic status of developing countries, which aims at self-reliance in agriculture and alleviating social evils related to distress, hunger, famine and food shortage.
- The Mexican food crisis was an impetus for the Green Revolution as Professor Norman Borlaug developed high-quality seeds by genetic modification and cross-fertilization of good-quality wheat. This experiment was successful in Mexico and in 7 years wheat production was doubled.
- This experiment achieved self-sufficiency and started a similar revolution in other crops around the world. The Rice Revolution took place in the Philippines and Japan and spread to Southeast Asia.
- In 1961, M.S. Swaminathan invited Norman Borlaug to join him in this revolution. M.S. Swaminathan suggested a similar revolution in Indian agriculture.
- Intensive Agriculture District Program (IADP) on a pilot basis in 7 districts Jalandhar, Aligarh, Shahbad (Bihar), Raipur, West Godavari (AP), Thanjavur (TN), Pali (Rajasthan).
- This program was successful and the Intensive Agricultural Sector Program was started in 1964-65 and the number of districts was increased to 32.
- This program was started in 1965-66 which is considered to be the initial phase of the Green Revolution in India.

Also, check out the Kisan Credit Card scheme here.

Benefits of the Green Revolution

- The **Green Revolution** was relevant and extremely important for a country with a perennial food crisis and population explosion.
- The Green Revolution ended the problem of hunger and famine to a great extent.
- Simultaneously, the Green Revolution gave birth to capitalist agricultural practices in India, which created surpluses in agriculture and led to its commercialization.
- The Green Revolution developed rural infrastructure which was a precondition for the Green Revolution.
- The Green Revolution made India self-sufficient in the matter of food grains.
- The financial burden was reduced due to agricultural imports which can now be included in various poverty alleviation programs like Backward Area Development Programme, IRDP, Tribal Area Development Program etc.
- The increase in the wage rate due to the Green Revolution made cash money available to the farmers.
- The development of agro-processing industries and food-processing industries led to the industrialization of Tier-II/III cities. This gave rise to a high rate of urbanization.
- Population growth in the 60-80s required a high food supply, which was made possible only by the Green Revolution.
- The Green Revolution gave rise to the mechanization of agriculture.
- Land reforms, consolidation of land holdings etc. were done in Green Revolution areas.
- The back-and-forth links between agriculture with industries were strengthened. Forward linkage means the supply of raw materials to the industry. Backward linkage refers to the demand for raw materials from the industry.

Check out the Operation green scheme here.

Indian Council of Agricultural Research (ICAR)

- Indian Council of Agricultural Research (ICAR) is an autonomous organization under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Welfare, Government of India, which is responsible for coordinating agricultural education and research in India.
- It is the largest network of agricultural research and education institutions in the world.
- Its headquarter is located in New Delhi and the Union Agriculture Minister serves as its chairman.
- Previously it was known as the Imperial Council of Agricultural Research. It was later established as a registered society under the Societies Registration Act, of 1860 pursuant to the report of the Royal Commission on Agriculture on 16 July 1929.
- The council is the apex body for coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences throughout the country.
- ICAR, through its research and technology development, has been a pioneer in ushering in the Green Revolution in agriculture and its subsequent development in India, which has increased the country's production of food grains by 5.6 times, horticulture crops by 10.5 times, fish by 16.8 times.

Study what is Zero-budget Natural Farming here.

Examples of the High Yield Crops

- Recently the researchers of the Indian Agricultural Research Institute (IARI) have genetically developed a new variety of Arhar dal (Pigeon-pea) which has the capacity to mature in 120 days while also maintaining the level of output at 20 quintiles per hectare which is given by the normal variety of crops which require at least 160-180 days for complete maturation.

Details of the normal Arhar crop

- If the Arhar plant is left to grow on its own it can even become a complete perennial tree.
- In the states like Eastern Uttar Pradesh and Bihar, the farmers usually plant their crops in the months of June-July of each year and the harvest is done after around 8 to 9 months in the months of March-April of next year.
- Whereas in the states like Maharashtra, Madhya Pradesh and Karnataka the harvest period is only of around 6 months and the production capacity is around 20 quintals per hectare.

Also, check out the PM Kisan Sampada Yojana here.

Details of the new Arhar variety

- The new variety of the Other plant is known as the PADT-16 which is the Pusa Arhar Determinate and is developed by a team of researchers led by R.S. Raje and Prabhu who are the chief scientist at the genetic division of the IARI.
- This variety of the plant will be ready for harvesting in only four months which is very less as compared to the present stone variety.

- Also, the yielding capacity of this new variety will be the same as compared to the normal variety which is 20 quintals per hectare.
- The growth of this new variety will be shot with a maximum height of around 95 CM as compared to the height of 175 cm acquired by the medium-duration variety of the plant and 300 CM height obtained by the perennial variety.
- The new Arhar variety requires less amount of water. Hence it supports the level of water conservation prospects that India is focusing on currently.
- Moreover, only one spray of the insecticide will be required against the Maruca insect and Pod Borer after the initiation stage of 65 to 70 days.
- This will also reduce the prospects of soil degradation which is the ultimate aim of the soil health card scheme launched by the government of India.
- The commercial production of this crop has been started in 2018.

Also, check out the article on Agricultural Produce Market Committee (APMC) here.

We hope that all your doubts regarding the High Yield Crops will be cleared after going through this article. You can check out our UPSC Online Coaching, and download the Testbook App now to check out various other topics relevant to the UPSC IAS Exam.