IARI Breeds Nutrient-Rich Hybrid Maize

Recently Indian Agricultural Research Institute (IARI) scientists have bred world's first quality protein and pro-vitamin A-rich bio-fortified hybrid maize.

- Maize, the third most important foodgrain following wheat and rice, is grown throughout the year in India. Popularly known as corn, it is used to make food items such as chips, flakes, popcorns etc.

Nutrient-Rich Hybrid Maize

- Cereal grains are high in carbohydrates (65-75%) and low in protein (7-12%) and their proteins are deficient in essential amino acids such as lysine and tryptophan.
- Lysine and tryptophan are two essential amino acids- building blocks of protein- which cannot be synthesized by body and must be supplied to body via diet.
- **Hybrid maize Pusa Vivek QPM 9** Improved is claimed to be the world's first ever rich in lysine and tryptophan as well as pro-vitamin A.
- Vitamin A, a micronutrient, is required for good vision, healthy teeth, skin and skeletal tissue. Deficiency of Vitamin A, predominantly seen in developing countries, can cause blindness and increase the susceptibility of an individual to infectious diseases.
- Although, vitamin A rich maize has been developed elsewhere, the new variety is important as it is rich not only in vitamin A but also in two essential amino acids as well.
- The improved version incorporates an Opaque-2 gene that enhances lysine and tryptophan content, and another gene crtRB1, which results in higher levels of carotenoids (beta-carotene, alpha-carotene and beta-cryptoxanthin) that convert into vitamin A in the body. Normal maize has more of lutein and zeaxanthin, which are carotenoids that cannot convert into vitamin A.
- The bio-fortified hybrid is not genetically modified, as both the Opaque-2 and crtRB1 genes are obtained from maize lines and not any alien/unrelated plants or microorganisms.

Significance

- It can be a game changer in countering hidden hunger which stems from mineral and vitamin deficiencies, often caused by a lack of diversity in the diet.
- It has potential to improve the nutritional status of a large population covering the children suffering from malnutrition which can enhance India's ranking in Global Hunger Index (GHI) which is currently in dismal state (India ranked 103 out of 119 countries in the GHI 2018).
- The early maturity of the hybrid maize makes it suitable for hilly and relatively water-stressed regions like Himachal Pradesh, Uttarakhand, Maharashtra etc.
- It can also be used by animal feed makers, who currently buy synthetic lysine as the grain itself has quality protein and pro-vitamin A. The poultry and pigs will, then, have more body weight gain and better feed conversion ratio.

Indian Agricultural Research Institute (IARI)

- Indian agricultural Research Institute (IARI), popularly known as Pusa Institute, began in 1905 at Pusa (Bihar) with the generous grant from an American philanthropist, Mr. Henry Phipps.
- Following a devastating earthquake in 1934, the institute was shifted to Delhi on 29th July 1936.Post independence, the institute has been renamed as Indian Agricultural Research Institute (IARI).

- The green revolution that brought smiles to millions of Indians bloomed from the fields of IARI with the development of famous wheat varieties which contributed to massive production.
- IARI continues to be the leading institution for agricultural research, education and extension in the country.