BIO-FORTIFIED POTATOES - ENVIRONMENT

NEWS: Bio-fortified potatoes, with added iron content, will soon be available in Indian markets, said the Director-General of the Peru-based International Potato Center (CIP).

Biofortified Sweet Potatoes in India

Vitamin A-rich sweet potatoes, developed using biofortification technology from the International Potato Center (CIP), are already introduced in Karnataka, Assam, West Bengal, and Odisha. These sweet potatoes aim to combat Vitamin A deficiency, a common nutritional issue in many Indian states.

Iron-Fortified Potatoes: International Progress and Indian Evaluation

The first iron-fortified potato variety has been released in Peru, showing promise for addressing iron deficiency. In India, this iron-rich variety is currently under evaluation by the Indian Council of Agricultural Research (ICAR) to determine its adaptability to Indian agro-climatic conditions and farming systems.

CIP–South Asia Regional Centre (CSARC), Agra

The CIP-South Asia Regional Centre (CSARC) has been established in Agra, Uttar Pradesh, a prominent potato-growing belt. It aims to serve not just Indian states like Uttar Pradesh, Bihar, and West Bengal, but also neighboring South Asian countries.

Key objectives of CSARC include:

- Enhancing food and nutrition security.
- Increasing farmers' income through better productivity and value-addition.
- Improving post-harvest management and creating employment opportunities.
- The governance structure includes a coordination committee with Secretaries of Agriculture from India, Nepal, Bhutan, and Bangladesh, ensuring regional cooperation.

The International Potato Center (CIP): Global Overview

The International Potato Center (CIP) was established in 1971 as a global research-for-development organization.

Headquartered in Lima, Peru, CIP focuses on:

- Potato, sweet potato, and Andean root and tuber crops.
- Enhancing access to affordable and nutritious food.
- Supporting climate-resilient agri-food systems.
- Driving inclusive business models and job creation.

CIP maintains a research presence in over 20 countries across Africa, Asia, and Latin America.

What are Biofortified Crops?

Biofortified crops are those bred or developed to have higher levels of essential nutrients such as vitamins (e.g., Vitamin A), minerals (e.g., iron, zinc), or amino acids. Biofortification can be achieved through: Traditional plant breeding. Genetic modification. Modern biotechnology techniques.

Need for Biofortification

Widespread micronutrient deficiencies, especially in rural and low-income regions, call for affordable nutrition solutions. Many populations rely heavily on staple crops, which are often poor in essential micronutrients. Conventional supplementation or industrial food fortification may not reach remote rural areas, making biofortified crops a cost-effective, field-level solution.

Significance of Biofortification

- It is recognized as a sustainable and long-term approach to combat hidden hunger and malnutrition.
- Biofortified food provides nutrients in natural form without altering dietary habits.
- These crops are typically affordable and do not entail additional production or market costs.
- They are often high-yielding and agronomically viable, posing no productivity losses to farmers.
- Unlike industrial fortification, biofortification does not require sophisticated processing infrastructure.
- Golden Rice, genetically engineered to produce beta-carotene (provitamin A), is a well-known global example.

Comparison with Food Fortification

- Biofortification is done at the crop breeding stage, ensuring the nutrient is naturally present when the crop is harvested.
- Food fortification, on the other hand, involves adding nutrients during food processing, such as enriching rice or flour in factories.
- Biofortification is especially suited for rural food systems with limited access to industrially processed foods.

Challenges in Promoting Biofortified Crops

Agronomic constraints: Performance of biofortified varieties may vary across diverse agro-climatic zones in India.

Lack of price incentives: Farmers do not currently receive higher prices for biofortified crops, reducing adoption motivation.

Low consumer demand: Without awareness campaigns, the nutritional value of such crops is not recognized by consumers or traders.

Poor integration with nutrition programs: Government schemes like Mid-Day Meal, ICDS, and PDS rarely include biofortified food grains.

Inadequate R&D funding: Biofortified crop development receives less investment compared to GM crops or hybrid seed technologies.

Way Forward

- Enhance seed distribution networks to ensure farmers can access quality biofortified seeds across regions.
- Mainstream biofortified crops into government nutrition schemes such as Mid-Day Meal, ICDS, and PDS to increase their uptake and impact.
- Launch consumer education and awareness campaigns to create market demand for biofortified food products.
- Strengthen public-private partnerships and region-specific R&D to ensure these crops perform well under diverse Indian conditions.
- Conduct nutritional impact studies to demonstrate benefits and build public trust in biofortification.

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