From Research to Delivery

Better Crops
Better Nutrition

HarvestPlus
Hidden Hunger

is caused by a lack of micronutrients in the diet. It affects the health of more than half the world’s people.

More than 4 million preschool-age children have visible eye damage due to vitamin A deficiency, and many of them will go blind.

More than 1.5 billion people are anemic, often due to iron deficiency. This impairs children’s physical growth and mental development and reduces adults’ capacity for physical labor.

Billions of people are at risk from zinc deficiency—children are stunted and are at greater risk from infection and disease.

HarvestPlus

leads a global effort to breed and disseminate micronutrient-rich staple food crops to reduce hidden hunger among malnourished populations. It is an interdisciplinary program that works with academic and research institutions, civil society organizations, governments, and the private sector in more than 40 countries.

Target Nutrients & Crops

Vitamin A
Cassava • Maize • Sweet Potato

Iron
Bean • Pearl Millet

Zinc
Rice • Wheat
Imagine...

**Micronutrient-rich**
varieties of staple food crops that can be grown in a wide range of environments,

**nutritious**
seed that can be saved, shared, and grown by even the poorest farmers year after year, and

**healthier**
harvests that can provide nutrients directly to those who need them most.
Crop Development

- Screen Seed Banks for High-Nutrient Seed
- Develop New Micronutrient-Rich Crop Varieties
- Evaluate Crops for Release

Plant breeders develop varieties of staple food crops that not only perform well in farmers’ fields but have high amounts of micronutrients.

Plant breeders search seed banks for seed that are naturally high in iron, zinc, and vitamin A. We use these to breed new micronutrient-rich crops through a process called biofortification. Our nutritional genomicists also use tools such as marker-assisted selection to help speed up the breeding process. Once we have bred crops with the target levels of micronutrients, we test them in experiment stations and farmers’ fields in diverse geographical areas. These crops will also have resistance to pests and diseases or other traits desired by farmers, such as high yield and drought tolerance. For these new crops to be successful, they must perform as well as, if not better, than popular varieties grown by farmers.
Nutritionists ensure that the levels of micronutrients bred into food crops are sufficient to measurably improve nutrition.

Nutritionists work with plant breeders to establish breeding targets for micronutrients. We base these targets on the food intakes of target malnourished communities. We account for nutrient losses during storage and processing and the bioavailability of nutrients from staple foods. Nutritionists and food scientists measure the effects of processing, storage, and cooking methods on nutrient retention in crops and determine optimal practices to minimize nutrient loss. We also evaluate how effective micronutrient-rich crops are in improving human nutrition under controlled trials, as well as real world conditions.
Crop Delivery

- Release New Crop Varieties
- Strengthen Seed & Extension Systems
- Promote Marketing & Consumption of New Crops

Delivery teams help disseminate and promote micronutrient-rich crops and foods to both farmers and consumers in rural communities.

Delivery managers work with national partners to register and release new micronutrient-rich crop varieties in target countries. We engage with seed and extension systems to ensure that the crops are widely available and promoted to farmers. Our teams include marketing experts and behavior change specialists who collaborate with local organizations and communities to educate consumers on the benefits of eating these new crops. These new varieties must satisfy consumer tastes and have enough micronutrients to reduce malnutrition among rural communities that will grow and eat these foods regularly.

The HarvestPlus Strategy

Discovery

- Identify Target Populations & Set Nutrient Target
- Validate Nutrient Targets
- Discover & Screen Crop Genes

Development

- Improve & Evaluate Crops
- Test Nutritional Efficacy of Crops
- Study Farmer Adoption & Consumer Acceptance

Delivery

- Release & Disseminate Crops in Target Countries
- Promote Consumption of Crops
- Measure Crop Adoption & Improvements in Nutritional Status
Economists identify target populations that could benefit from micronutrient-rich crops and measure the impact of these crops once they have been released.

Economists review the prevalence of micronutrient deficiencies and undertake benefit-cost analysis to select target regions where micronutrient-rich crops would have the greatest impact. We collect data from these regions to understand the factors that affect whether farmers and consumers will adopt and consume these micronutrient-rich crops and products. Once released, we assess the number of farming households that adopt these new varieties. We also work with our nutritionists to measure improvements in nutritional status from consumption of these micronutrient-rich varieties.
Communications

- Promote Biofortification Strategy
- Assist in Promoting Crops in Target Countries
- Support Internal Communications for Global Network

Communication specialists promote biofortification as a strategy to improve nutrition. We use a variety of means including print, web 2.0, conferences, and media to reach different audiences. These audiences include scientists, practitioners, policymakers, donors, and the informed public. In addition, we assist delivery teams with communication efforts in target countries including quality control, branding, and advocacy. We also manage internal communications and coordination among our worldwide network of collaborators.

*HarvestPlus is a Challenge Program of the Consultative Group on International Agricultural Research (CGIAR). It is co-convened by the International Center for Tropical Agriculture (CIAT) and the International Food Policy Research Institute (IFPRI).*

### CGIAR Partners
- AgroSalud (Biofortification program based at CIAT)
- Bioversity International
- International Center for Tropical Agriculture (CIAT)
- International Maize and Wheat Improvement Center (CIMMYT)
- International Potato Center (CIP)
- International Center for Agricultural Research in the Dry Areas (ICARDA)
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
- International Food Policy Research Institute (IFPRI)
- International Institute of Tropical Agriculture (IITA)
- International Rice Research Institute (IRRI)

### Donors
- Asian Development Bank (ADB)
- Austrian Ministry of Finance
- The Bill and Melinda Gates Foundation
- Canadian International Development Agency (CIDA)
- The International Fertilizer Group
- International Life Sciences Institute (ILSI)
- Royal Danish Ministry of Foreign Affairs (DANIDA)
- Swedish International Development Agency (SIDA)
- Syngenta Foundation for Sustainable Agriculture
- United Kingdom Department for International Development (DFID)
- United States Agency for International Development (USAID)
- United States Department of Agriculture (USDA)
- The World Bank
- World Food Programme (WFP)

### Country Programs
- Embrapa (The Brazilian Agricultural Research Corporation)
- HarvestPlus China
- India Biofortification Program