HarvestPlus

HarvestPlus Update 2010

Cover: Ugandan farmer with freshly steamed orange sweet potato ready to eat. (Photo: M. Malungu)

Contents

Letter from the Director

There is a growing interest in the role of agriculture in improving nutrition. Biofortification—breeding staple food crops with higher nutrient content—is one way to do this. Our goal at HarvestPlus is to reduce hidden hunger by developing micronutrient-rich varieties of staple crops that can improve the diets of the poor.

So, how much progress have we made? During our **Discovery Phase** from 2003–2008, we identified target populations that could benefit from biofortification and conducted proof-of-concept research to prove that biofortification was feasible. We are now in our **Development Phase** (2009–2013). With our partners, we are breeding micronutrient-rich crops and testing them in the field. We are also conducting nutrition studies to ensure that these crops deliver on their promise of improving nutrition. Several crop varieties with at least 50% of our nutrient target will be released within the next year. This will pave the way for varieties, already in the breeding pipeline, with the full nutrient target levels. These will be released during our program's final **Delivery Phase** (2014–2018).

Dr. Howarth Bouis
Director, HarvestPlus

Click on the image or this link to view a 4-minute video of 2010 highlights from Dr. Bouis.

Crop Research & Development

Vitamin A Crops

Cassava

Nutrient: Vitamin A
Baseline Content: 0 ppm
Target: 15 ppm
Target Countries: Democratic Republic of Congo, Nigeria
Release Year: 2011 (in Nigeria)
Agronomic Traits: High-yielding, virus resistance

Maize

Nutrient: Vitamin A
Baseline Content: 0 ppm
Target: 15 ppm
Target Countries: Zambia
Release Year: 2012
Agronomic Traits: High-yielding, disease & virus resistance, drought tolerance

Breeding

Three first-wave varieties with vitamin A content of 6–8 parts per million (ppm) (about 50% of our target) passed official pre-release trials and entered farm testing in 13 states in Nigeria. Since cassava is propagated by stem cuttings, HarvestPlus partners planted stems under an intensive irrigated regimen to accelerate multiplication for future delivery. Five second-wave varieties with higher levels of vitamin A (up to 12 ppm) are in the breeding pipeline.

In the Democratic Republic of Congo, a first-wave variety with more than 50% of the target is being multiplied for delivery to farmers.

Nutrition

In Nigeria, most of the cassava for human consumption is grated, soaked, pressed, and roasted into a flour called *gari*. Roughly 70% of the vitamin A is lost through this process before it is eaten. However, research showed that the vitamin A in cassava is 2–3 times more bioavailable to the body than originally assumed. In addition, average per capita consumption in the southern states of Nigeria where cassava is eaten is 200–300 grams higher than originally assumed. Therefore despite the high losses of vitamin A from *gari* processing, initial target levels for vitamin A in cassava are still adequate to provide 50% or more of the average daily vitamin A requirements of women and children.

Breeding

Nine leads with vitamin A levels of up to approximately 9 ppm and competitive yields and agronomic attributes comparable to varieties already in the market emerged from testing during the 2009–2010 crop cycle. The Zambia Agriculture Research Institute (ZARI) submitted the top 5 candidate lines to the Seed Control and Certification Institute (SCCI) for official testing for release. They were planted at several locations in Zambia in late 2010 for their first-year National Performance Trials.

Molecular marker selection (MAS) in maize was fully implemented and used in applied breeding at the International Maize and Wheat Improvement Center (CIMMYT) in 2010. Increases of up to 10 ppm vitamin A content as compared with other varieties in the breeding pipeline were observed, indicating that MAS can accelerate breeding by one season and substantially enhance efficiency and effectiveness of breeding for vitamin A.

Zambian farmer displays an ear of vitamin A-rich maize. (Photo: H. de Groote)

Nutrition

As with vitamin A cassava, research showed that the vitamin A in maize is about twice as bioavailable as originally assumed, which can have implications for lowering breeding targets.

Results from a background survey measuring maize and vitamin A intake, as well as vitamin A status of children and women, in two Zambian provinces were released. Estimated maize intakes among women (~300 grams/day) were less than assumed in setting targets (400 g/day), whereas intakes among preschool children (~200 g/day) were comparable to preliminary estimates. High rates of chronic malnutrition (i.e., stunting) among children under five years of age were also observed. This was accompanied by high rates of infection and reported symptoms of illness, particularly those associated with respiratory infections. The prevalence of vitamin A deficiency derived from blood analysis among children 2–5 years of age (48%) is considered to be severe, but this figure could be partly explained by high rates of infection and not only by inadequate consumption of vitamin A-rich foods. Click here for the report from the study.

Impact and Policy Analysis

Researchers completed an analysis of Zambian consumers' willingness to pay for orange maize compared to yellow and white varieties. Results showed that the orange color of vitamin A maize is not a hindrance to consumer acceptance. Consumers who received nutrition

First Global Conference on Biofortification

HarvestPlus convened the First Global Conference on Biofortification, which brought together many organizations and individuals that have been involved in biofortification over the past decade. The conference took place in Washington, DC November 9–11, 2010. Three hundred scientists, researchers, practitioners, decisionmakers, and students attended. The main objectives of the conference were to:

- determine the current state of biofortification and take stock of research, global investment, and experience in biofortification;
- raise the visibility of biofortification as a promising agricultural intervention for public health; and
- chart the future for biofortification by identifying synergies and gaps in knowledge and ways to forge partnerships and collaborations.

The conference spanned two and a half days and was structured with a keynote address and panel discussion each morning and technical symposia in the afternoons. Keynotes were delivered by Ambassador William Garvelink, Deputy Coordinator for Development for U.S. Government's Feed the Future Initiative, Nicholas Kristof, Pulitzer Prize winning *New York Times* columnist, Navyn Salem, Executive Director of Edesia Global Nutrition Solutions, and David Nabarro, Special Representative on Food Security and Nutrition to United Nations Secretary-General Ban Ki-moon.

U.S. Senator George McGovern, a strong supporter of hunger and nutrition issues for the past four decades, also wrote a letter to participants highlighting the importance of the conference and of biofortification. He wrote, "Biofortification, and its potential benefits to those who are malnourished, clearly should have a prominent place in our research, in our advocacy, and in our global development goals."

Full materials from the conference (videos, briefs, PowerPoint presentations, etc.) are available on the conference blog.

New York Times columnist Nicholas Kristof spoke to conference participants about raising the visibility of micronutrient malnutrition. (Photo: N. Palmer, CIAT) information, whether through radio or community leaders, were more likely to accept the new variety of maize, suggesting the importance of mass media and interpersonal communication in encouraging consumer adoption.

These results are consistent with other consumer acceptance studies conducted in Ghana (orange maize) and Uganda (orange sweet potato). When nutrition information is provided, consumers are willing to pay substantial premia for the orange varieties of these crops.

Iron Crops

Bean

Nutrient: Iron
Baseline Content: 50 ppm
Target: 94 ppm
Target Countries: Democratic Republic of Congo, Rwanda
Release Year: 2012 (in Rwanda)
Agronomic Traits: High-yielding, virus resistance, heat & drought tolerance

Breeding

HarvestPlus conducts research on both bush and climbing beans. In Rwanda, more than 30 leads were advanced to multi-location trials in 2010. Six climber lines had iron levels of greater than 80 ppm, and 9 bush lines displayed greater than 74 ppm. From these leads, 3 climber and 2 bush lines were selected for fast-tracking through the first wave of releases slated for 2012.

In the Democratic Republic of Congo, 4 lines expressed iron levels of greater than 74 ppm. Of these, 1 bush and 1 climber line were made available to distribute to farmer households.

New technologies also helped to lower costs and speed up mineral analysis at partner institutions, which is essential for successful breeding. X-ray Fluorescence (XRF) screening is being implemented in Rwanda, Bangladesh, and India for beans, rice, and wheat, respectively.

Nutrition

Background nutrition studies for high-iron beans conducted in 2010 included a 24-hour recall to determine bean intake among women and children, analysis of iron status of women through blood collection, and evaluation of the iron content of bean varieties. The average bean intake by women in the Northern and Southern provinces was found to be lower than the 200 g/day used to set the preliminary target for breeders.

Several studies were carried out in Rwanda and Switzerland to investigate the potential benefit of consuming biofortified beans for women of childbearing age. Two substances present in cooked beans (a type of fiber known as phytate and a group of chemicals known as polyphenols) could interfere with the body's ability to capture and use the iron in the beans. Only phytates seem to decrease iron absorption when beans are consumed habitually and could, therefore, have an impact on the contribution of iron beans in improving nutrition.

A feeding trial among school children in Mexico using biofortified black beans compared to control black beans found a modest increase in dietary iron for the high-iron bean group, as well as a significant improvement in biochemical markers of iron status, the receptors that help the body transport iron. Children in the study consumed approximately 50 g/day of beans, which is half the average consumption assumed for children in setting targets. These results suggest that with more time and higher bean consumption, a stronger and more consistent effect may be seen in other aspects of iron status.

Kedar Rai (far left) and colleagues with the new XRF machine at ICRISAT's office in Patancheru. (Photo: ICRISAT)

Pearl Millet

Nutrient: Iron
Baseline Content: 47 ppm
Target: 77 ppm
Target Countries: India
Release Year: 2012
Agronomic Traits: High-yielding, mildew resistance, drought tolerance

Breeding

Initial release of high-iron pearl millet in India will be of open-pollinated varieties (OPV); high-iron hybrids will not be available until 2014 but are under development.

In the 2010 dry season, three new high-iron versions of an OPV of pearl millet (ICTP-8203) were developed. The highest yielding version (11% higher grain yield and larger grain size) had 78 ppm of iron, which is 10 ppm more iron than the non-improved ICTP variety.

Based on evaluations of commercial hybrids at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), 7 hybrids with 20% more iron than average hybrids were identified as promising fast-track candidates.

Nutrition

Three background nutrition surveys for pearl millet in India were completed in rural areas of Maharashtra, Gujarat, and Rajasthan (the three highest pearl millet consuming states of India) using the interactive 24-hour recall method of food intake to determine pearl millet consumption among women and children. Two of the surveys also studied the iron status of women of childbearing age. As seen with bean, pearl millet contains phytates that lower the absorption of minerals such as iron, zinc, and calcium. In order to better estimate the potential impact of biofortified pearl millet consumption, the amount of iron and zinc absorbed from pearl millet is being measured in children under five years from a rural district of Karnataka. Results from these studies are forthcoming.

Impact and Policy Analysis

A study to determine factors affecting adoption of new varieties of pearl millet was conducted in Maharashtra and Rajasthan, two major pearl millet producing states. Researchers collected information from farmers, seed suppliers, and extension officers on varietal choice preference and sources of information about new varieties. Findings revealed significant differences across the two states in terms of the types and varieties of pearl millet grown and the role of seed suppliers versus extension officers in the diffusion of seeds and information about new varieties.

In Maharashtra, the vast majority of farmers purchased hybrid seeds from seed suppliers, namely Mahyco, Pioneer, and Nirmal. In Rajasthan, 50% of fields were planted with local varieties that farmers obtained from previous harvests or received from family and friends, and 50% were planted with hybrid varieties procured from seed companies such as New Nandi Seeds Corporation and Pioneer, among others. In both states, farmers reported that their primary and most trusted source of information about new varieties is other farmers, such as their neighbors, extended family, and coworkers in common cooperatives. However, farmers in Maharasthra were more likely to cite private sector agents as an important source than in Rajasthan where public sector agents (agricultural extension officers and agricultural information centers) were the preferred source of information. These results will inform the delivery strategy for iron-rich pearl millet.

Zinc Crops

Rice

Nutrient: Zinc
Baseline Content: 16 ppm
Target: 24 ppm
Target Countries: Bangladesh, India
Release Year: 2013 (in Bangladesh)
Agronomic Traits: High-yielding, disease & pest resistance

Breeding

Breeding for high zinc in both Bangladesh and India assumed full operational scale at the International Rice Research Institute (IRRI). Through the transfer of more than 3,500 selected plant materials from IRRI, HarvestPlus also brought activities at the Bangladesh Rice Research Institute (BRRI) up to full-speed. BRRI will now test these agronomically promising materials under local conditions and further improve them by crossing with local varieties.

More than 40 lines with at least 4 ppm additional grain zinc and good agronomic characteristics were promoted to multi-location trials in Bangladesh. Eight of these lines displayed 6–8 ppm more zinc in the grain, which is close to the breeding target. These promising high-zinc leads are currently being validated to identify candidates for official registration trials.

Nutrition

Results from 2009 background nutrition studies, including a 24-hour recall, for rice in Bangladesh were released in 2010. The studies were conducted among women and children in two rural districts. Results showed that rice is the main source of energy and zinc in the diets of women and children and that daily rice consumption matched earlier estimates—on average, women and children consumed 422 grams and 160 grams of rice a day, respectively. In addition, almost three-quarters of women and one-quarter of children had inadequate zinc intakes. These findings confirm assumed consumption amounts and target nutrient levels set for breeding. The study also included simulations to estimate the impact of biofortified rice at various adoption levels and showed that adoption of biofortified rice could markedly decrease inadequate zinc intakes for women and children. For more results from the study, click here.

Wheat

Nutrient: Zinc
Baseline Content: 25 ppm
Target: 33 ppm
Target Countries: India, Pakistan
Release Year: 2013 (in India)
Agronomic Traits: High-yielding, disease resistance

Breeding

The first HarvestPlus South Asia nurseries were set up at 3 locations in India and 2 in Pakistan during the 2009–2010 crop season to gain a better understanding of micronutrient variation across different geographical locations and to identify promising leads adapted to local conditions. These were set up by HarvestPlus partners who planted and evaluated materials: Punjab Agricultural University, the Indian Agricultural Research Institute, and Banaras Hindu University in India and the National Agricultural Research Center in Pakistan.

Eight lines displayed an additional 6 ppm of zinc, and 1 line expressed the full target level.

CIMMYT and Sabanci University in Turkey conducted analysis of farming practices and found that foliar applications of zinc fertilizer have a greater effect on increasing grain zinc levels than soil applications and can increase grain zinc by up to 10 ppm. As a result, foliar application of zinc fertilizer could be seen as a short-term, complementary strategy to increase grain zinc content. Economic cost-benefit studies on this complementary approach are underway.

Impact and Policy Analysis

A study to determine factors affecting adoption of new varieties of wheat was completed among farmers in Eastern Uttar Pradesh (EUP) and Rajasthan states. In both states, pure varieties significantly dominate hybrids and local varieties. There are, however, significant differences across the two states in terms of the role of seed suppliers versus extension officers in the diffusion of seeds. Farmers in EUP were more likely to obtain their wheat seed from agri-service centers, whereas farmers in Rajasthan reported that their seed was obtained from agri-input suppliers. In both states, the majority of farmers stated that their primary and most trusted source of information about new varieties is other farmers, in particular neighbors, which highlights the importance of informal networks that should be used to ensure dissemination of information about zinc-rich wheat.

Publications and Media

In 2010, HarvestPlus researchers and collaborators published numerous peer-reviewed journal articles, book chapters, and other similar materials. For a complete list of 2010 publications, click here.

HarvestPlus also received considerable media coverage from a range of outlets around the world. For a complete list of media coverage from 2010, click here.

To download the revised HarvestPlus brochures, click here.

Follow us on Facebook and Twitter.

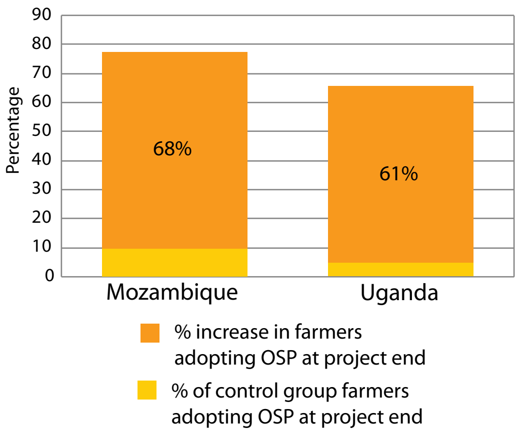
Other Highlights

Orange Sweet Potato Delivery in Uganda and Mozambique

HarvestPlus and its partners disseminated orange sweet potato (OSP) to more than 24,000 households in Uganda and Mozambique from 2007–09. This was the first time that HarvestPlus had deployed a biofortified crop with a visibly different trait (color) on such a large scale. The project assessed OSP adoption and whether this resulted in improved vitamin A intakes among children and their mothers.

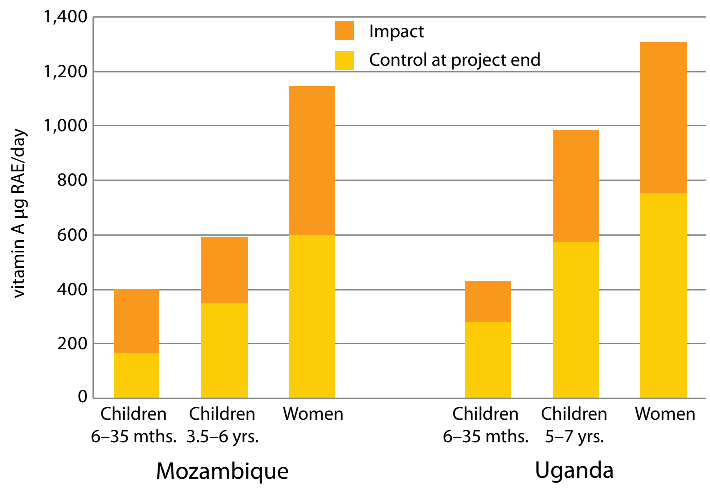
As a result of project activities, there was a 68 percentage point increase in adoption in Mozambique and a 61 percentage point increase in Uganda among project households (Figure 1). In both countries, OSP adoption resulted in substantial substitution of OSP for other traditional sweet potato varieties in terms of area under cultivation. The project increased the share of OSP in total sweet potato area by 56 percentage points in Mozambique (from a base of 9%) and by 44 percentage points in Uganda (from a base of 1%).

Figure 1: Percentage of farmers adopting OSP at project end, Mozambique and Uganda



The project resulted in a significant increase in the intake of OSP among children and women in both Mozambique and Uganda. Simplified data shown in Figure 2 capture the substantial impact the project had in increasing vitamin A intakes.

Figure 2: Impact of REU intervention on mean vitamin A intakes (µg retinol activity equivalents (RAE)/day), Mozambique and Uganda



Notes: Estimates are mean vitamin A intakes at project end (2009) in both countries. Mean vitamin A intakes at baseline were not significantly different between project and control households within each age group. For younger children in both countries, separate groups of children were assessed at the beginning and end of the project. For older children and women, the same group was followed over time. Retinol is the active form of vitamin A found in the body. Beta-carotene is converted to retinol by the body, and the amount of retinol derived from beta-carotene is expressed as retinol activity equivalents (RAE).

Compared to intakes at baseline, vitamin A intake doubled for all three groups by project end in Mozambique and increased by two-thirds for younger and older children and nearly doubled for women in Uganda. For the age group of greatest concern, children aged 6–35 months, OSP contributed 78% of the total vitamin A intake in Mozambique and 53% in Uganda. Statistics cited here are for all households, whether they actually adopted OSP or not. If only adopting households are considered, then the impact on vitamin A intakes is approximately 30% higher in both countries.

While the OSP and vitamin A intakes were recorded during the main postharvest periods, home production of OSP could be expected to provide these levels of intakes for two to three months of the year in Mozambique and for four to five months of the year in Uganda.

Analysis showed that the costs of delivering OSP to target households could have been substantially reduced by eliminating particular nonessential components.

This pilot project provided key insights into how OSP adoption can be successfully scaled up.

For more details, see the project brief.

Delivering Biofortified Crops

In 2010, HarvestPlus hired country managers to coordinate delivery activities in target countries where crops will first be released. Developing strong support and buy-in at the country level is critical to successfully delivering micronutrient-rich crops. In all countries, partnerships at the local and national level were cultivated throughout 2010. In Rwanda and Zambia, Net-Maps, a social network mapping analysis tool, were conducted to identify key stakeholders who could be influential in promoting or slowing down the delivery and adoption of the new crops. In Rwanda, Zambia, and India, studies to identify key market insights on the benefits of nutrient-rich crops in each country were conducted and will form the basis of brand development.

Country Programs

HarvestPlus collaborates with national biofortification programs in Brazil, China, and India.

Brazil

BioFORT Brasil is coordinated through Embrapa (the Brazilian Agricultural Research Corporation) under the leadership of Marilia Nutti. Breeding efforts continue to develop nutrient-rich varieties of eight different crops: rice, sweet potato, bean, cowpea, cassava, maize, wheat, and pumpkin. Biofortified varieties of several of these crops have already been released. The first seeds, stems, and cuttings of cultivars of higher nutritional level were delivered to the states of Maranhão and Sergipe, which have the lowest Human Development Indices in the country. During 2010, thirteen demonstration plots were put in place to distribute seeds and stems to small farmers. Field days were also held in several states and municipalities. Embrapa received a US$600,000 grant for 2011–2013 to conduct nutrition research on iron, zinc, and carotenoids in several crops and zinc and iron fertilization of wheat. The Embrapa biofortification website and blog were also launched.

Brazilian farmer on an Embrapa sweet potato demonstration plot. (Photo: Embrapa)

China

HarvestPlus China, which is coordinated through the Chinese Academy of Agricultural Sciences, is developing high micronutrient varieties of rice, wheat, maize, and sweet potato. In 2010, a new rice variety, "Zhongguangxiang 1," with high yield, premium grain quality, and medium iron content (6.5 ppm) in the polished rice was officially released in Guangxi Province. Polished rice typically contains 2 ppm of iron. Ten vitamin A-rich sweet potato cultivars were planted on demonstration plots in 7 provinces where the prevalence of vitamin A deficiency is high. More than 20,000 virus-free sweet potato plants have been tissue cultured for dissemination to poor farmers.

India

In 2010, HarvestPlus signed a memorandum of understanding (MOU) with the Indian Government's Department of Biotechnology and the Indian Council of Agricultural Research to expand biofortification research in India. This MOU was negotiated over several months and facilitated by Dr. Kedar Rai, who directs HarvestPlus partnerships with the Indian agricultural research institutions. HarvestPlus collaborates with Indian scientists to develop biofortified rice, wheat, pearl millet, and sorghum. Dr. Rai also continues his responsibilities as head of breeding for high-iron pearl millet at ICRISAT.

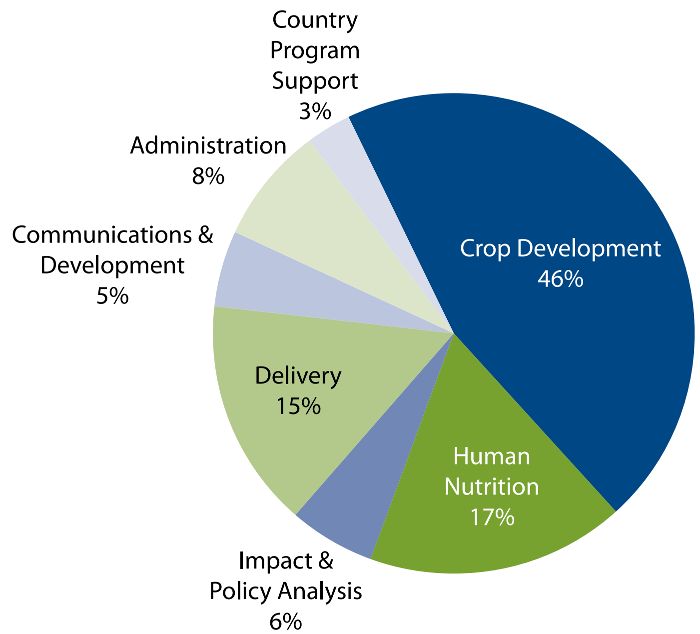
Financial Summary

Budget 2010 (US$ Thousands)

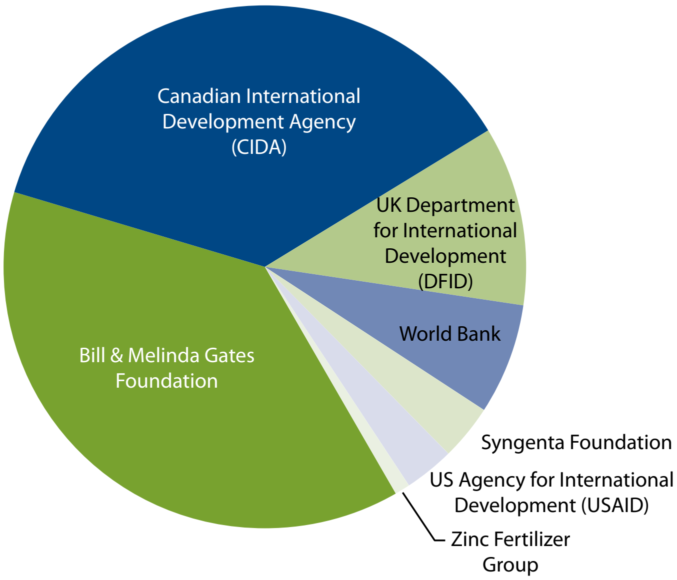
Crop Development	10,969
Human Nutrition	4,199
Impact & Policy Analysis	1,396
Delivery	3,709
Communications & Development	1,231
Administration	1,895
Country Program Support	730
Total Unrestricted	**24,129**

Grand Challenges 9 Project	3,000
Zinc Fertilizer Project	313
Total Restricted	**3,313**

TOTAL PROJECT	**27,442**



Donors in 2010



Donors 2003-2010

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)

Governance

2010 Program Advisory Committee

Jeroen A. Bordewijk
Senior Vice President (Retired), Unilever Corporation, Supply Chain Excellence Programme, Netherlands

Ruben Echeverria
Director General, CIAT, Colombia

Shenggen Fan
Director General, IFPRI, United States

Richard (Dick) Flavell
Chief Scientific Officer, Ceres Inc.,United States

Mahabub Hossain
Executive Director, Bangladesh Rural Advancement Committee (BRAC), Bangladesh

Michael Lipton
Research Professor, Poverty Research Unit, University of Sussex, United Kingdom

Peter McPherson (Chair)
President, Association of Public and Land-grant Universities (APLU), United States

Patrick J. Murphy (Chair-Audit Committee)
Vice-President (Retired), Bank of America, United States

Ruth Oniang'o
Founder, Rural Outreach Program (ROP) and Editor-in-Chief, African Journal of Food, Agriculture, Nutrition and Development (AJFAND), Kenya

Maria Jose Amstalden Sampaio
Chief Scientific Advisor, Embrapa, Ministry of Agriculture and Food Supply, Brazil

Peter Sandoe
Director, Center for Bioethics & Risk Assessment, University of Copenhagen, Faculty of Life Sciences, Denmark

M.S. Swaminathan
UNESCO Cousteau Chair in Ecotechnology & Chairman, M.S. Swaminathan Research Foundation, India

Barbara Underwood
Retired, Adjunct Professor of Nutrition, Columbia University, United States

Michele Veeman
Professor, Agricultural and Resource Economics, Department of Rural Economy, Faculty of Agriculture, Forestry, and Home Economics, University of Alberta, Canada

Mark Wahlqvist
Visiting Professor, Institute of Population Health Sciences, National Health Research Institutes, Taiwan

Qifa Zhang
Professor and Director, National Key Laboratory of Crop Genetic Improvement, Huazhong Agricultural University, China

HarvestPlus Staff

Representing more than 20 countries, HarvestPlus staff bring many years of experience from both the public and private sectors to address the problem of hidden hunger. HarvestPlus staff are employed by the International Center for Tropical Agriculture (CIAT) in Colombia or the International Food Policy Research Institute (IFPRI) in Washington, DC. Many staff are posted in countries where HarvestPlus plans to release micronutrient-rich staple crops. For a complete list of staff, click here.

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)

Country Programs

Embrapa (Brazilian Agricultural Research Corporation)
HarvestPlus China
India Biofortification Program

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.

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

HarvestPlus
c/o IFPRI
2033 K Street, NW
Washington, DC 20006-1002 USA
Tel: 202-862-5600
Fax: 202-467-4439
HarvestPlus@cgiar.org
www.HarvestPlus.org