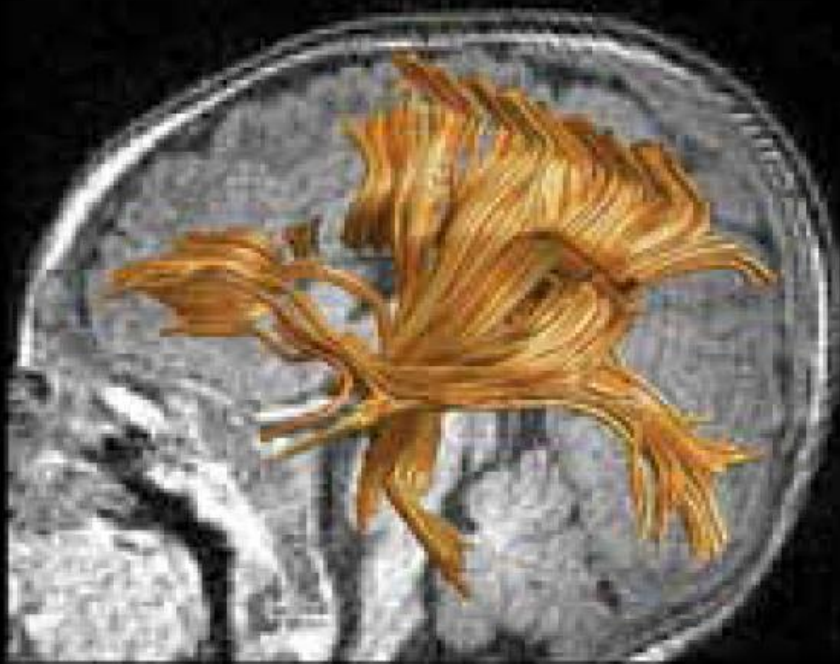




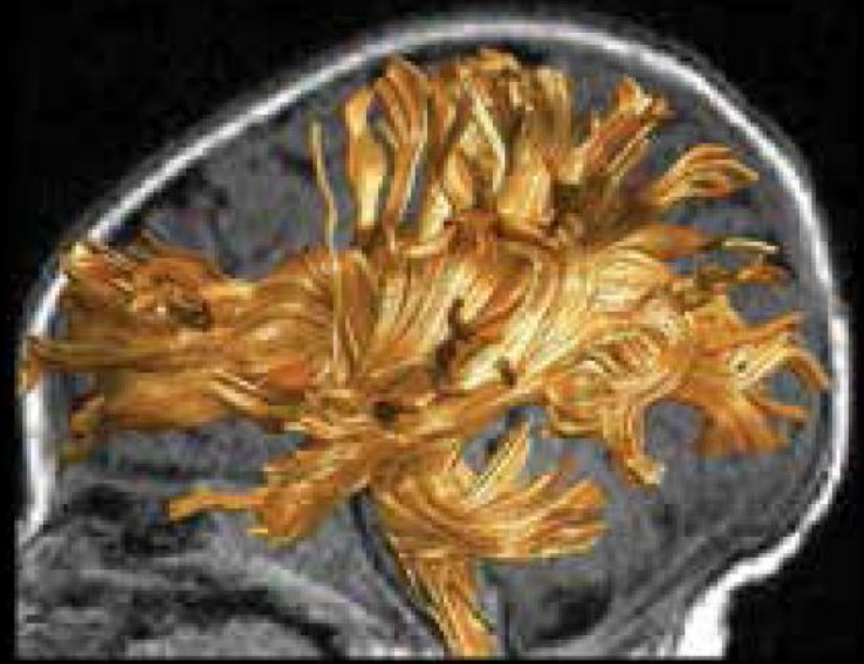
# HarvestPlus Alliance: Research, Development & Delivery of Micronutrient Dense Crops

Wolfgang H. Pfeiffer





## Stunted Infant



## Healthy

*Source:* Nelson and others (2017). © Nadine Gaab and Charles A. Nelson. Used with the permission of Charles A. Nelson; further permission required for reuse.

*Note:* The images illustrate two infants, 2–3 months old. The growth of one infant was stunted (panel b); the growth of the other infant was not (panel a). The images were obtained in Dhaka, Bangladesh, using magnetic resonance imaging (MRI). The left side of each panel shows the left side of the head. Each gold line represents a fiber tract—the long, thin fibers (axons) in the brain that transmit information to different neurons, muscles, and glands. It is apparent how much denser and more elaborate the connections are in the nonstunted infant. The colored images on the right side of each panel illustrate the same principles (neural connections) from a different orientation—a cross-section of the brain, from front to back.

# Hidden Hunger

A group of children, including a young girl holding a baby, looking at the camera. The background is a body of water.

**2 billion+ affected**

Photo: C. Hotz



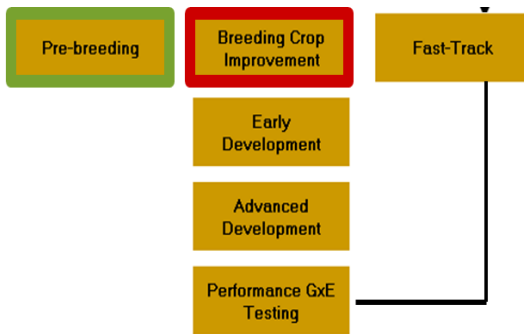
*addressed by*



**HarvestPlus** - an interdisciplinary, global alliance  
of more than 400 scientific and implementation  
partners in over 40 countries

HarvestPlus is a joint venture between two CGIAR Centers, the International Center for Tropical Agriculture (CIAT) based in Cali, Colombia and the International Food Policy Research Institute (IFPRI) based in Washington, D.C.

# *Will Biofortification Work?*



- Can breeding increase nutrient levels enough to improve human nutrition?



- Will the extra nutrients be bioavailable at sufficient levels to improve micronutrient status?



- Will farmers adopt and will consumers buy/eat in sufficient quantities?



# Crop Development





# ***Crop Development , Testing & Commercialization Partnership - example Wheat India***

## **Public Sector:**

IIWBR - (ICAR)  
IARI - Delhi  
PAU - Ludhiana  
BHU - Varanasi

**CIMMYT**

## **Private Sector:**

Ankur Seeds, Ajeet Seeds,  
Asta Beej Ltd, Bayer Crop  
Science, DCM Shriram  
Ltd., Krishidhan, Mahyco,  
Nirmal Seeds, Nuziveedu  
Seeds, Pantnagar Tarai  
Agri Seeds, Rasi Seeds,  
Shakati Vardhak, Sri Sai  
Seeds, Shriyanshi Seeds





# *Farmer preferred Trait Packages*

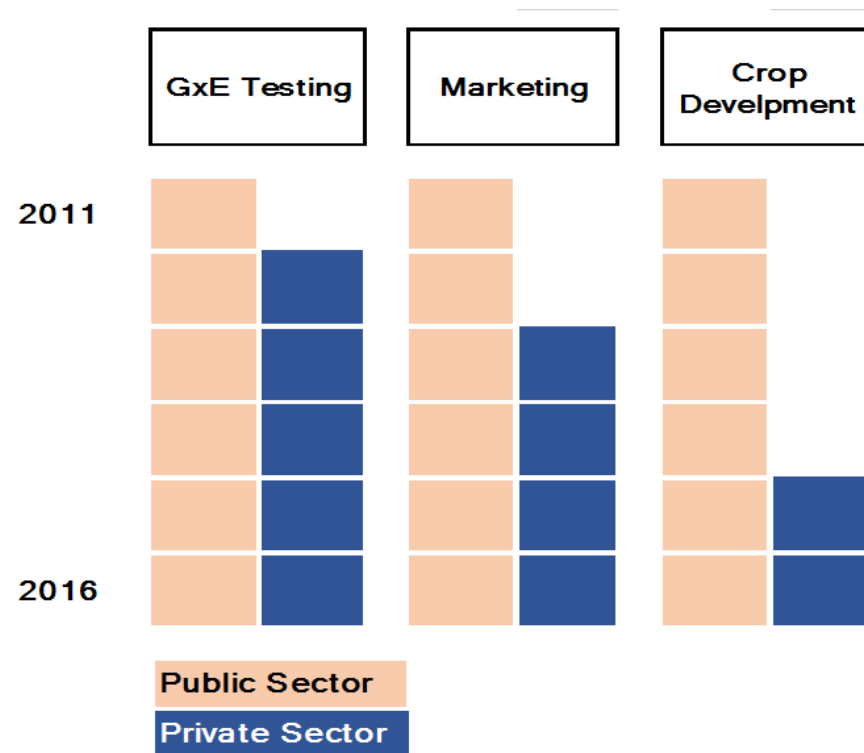


Seed production  
BHU6 2015



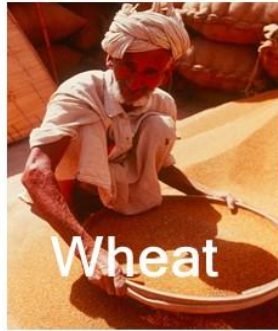
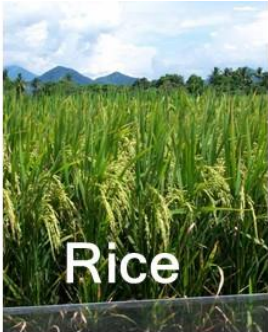
# Seed Production - Engaging Seed Companies

- Engage seed companies in testing & commercialization
- Risk-sharing/de-risking business
- Assist in promotion & awareness campaigns
- Assist companies establishing biofortified product lines
- Engage in early generation seed production shortening time to market





# By end of 2017 >180 varieties released in 30 countries

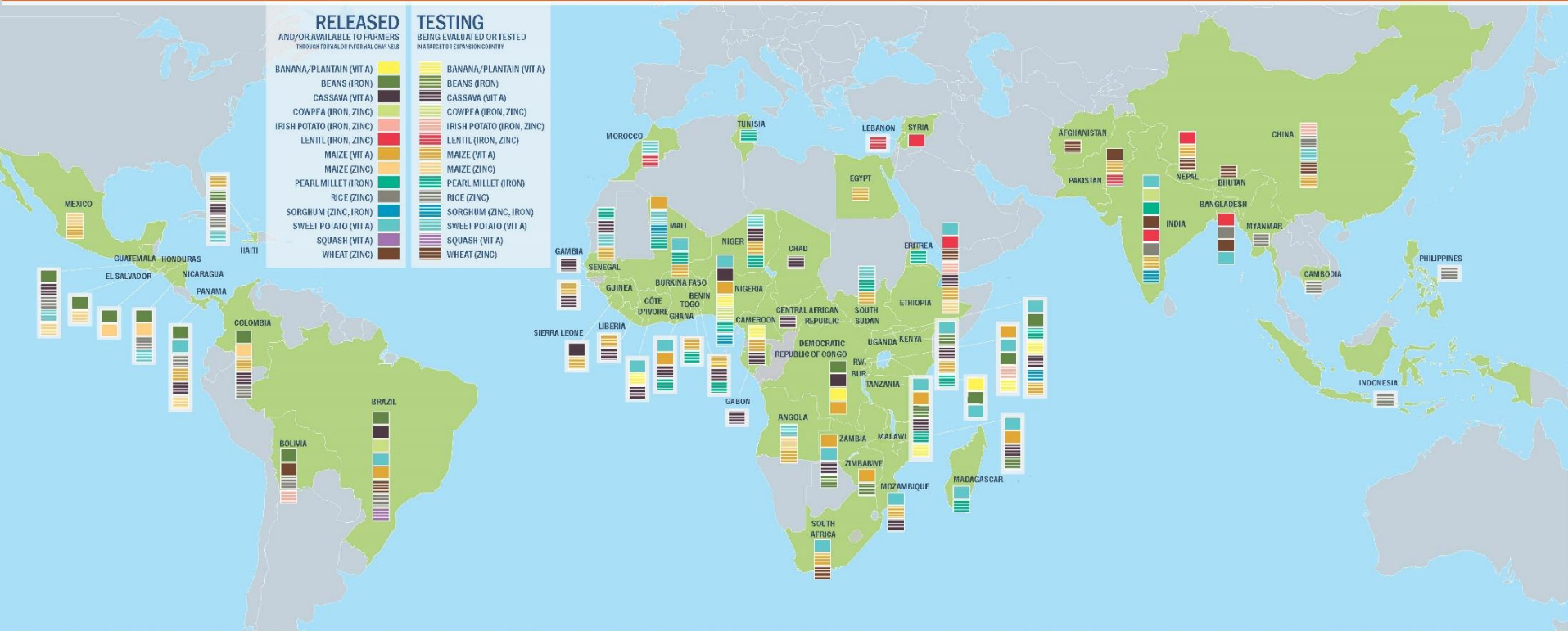


***... demonstrate Biofortification works ...***

# Biofortified crops in-testing in >60 countries

## BIOFORTIFIED CROPS: WHAT IS WHERE?

Biofortified crops are conventionally bred to have higher levels of essential vitamins and minerals





# ***Strategic Priorities***

## **Strengthen the pipeline of biofortified varieties**

- Successfully develop next waves of crops → Breed competitive crops to target nutrient levels and broader applicability across agro-ecological zones & uses
- Enhance knowledge base & deliver improved enabling technologies → Molecular markers & diagnostic tool development
- Mainstream biofortification → Core / non-negotiable trait → endorsed by CG-Center DGs
- Improve bioavailability of iron and zinc → Anti-nutrients & promoters  
Phytate / Phytase ...
- Improve nutritional stability → proVita-A retention/stability

# ***Will Biofortification Work?***

**... extra nutrients are bioavailable at levels to improve micronutrient status ...**





# Vitamin A maize improves vitamin A status and night vision of 4-8 yr old rural children in Zambia





# Iron pearl millet improves iron status, physical and cognitive performance of adolescents in India



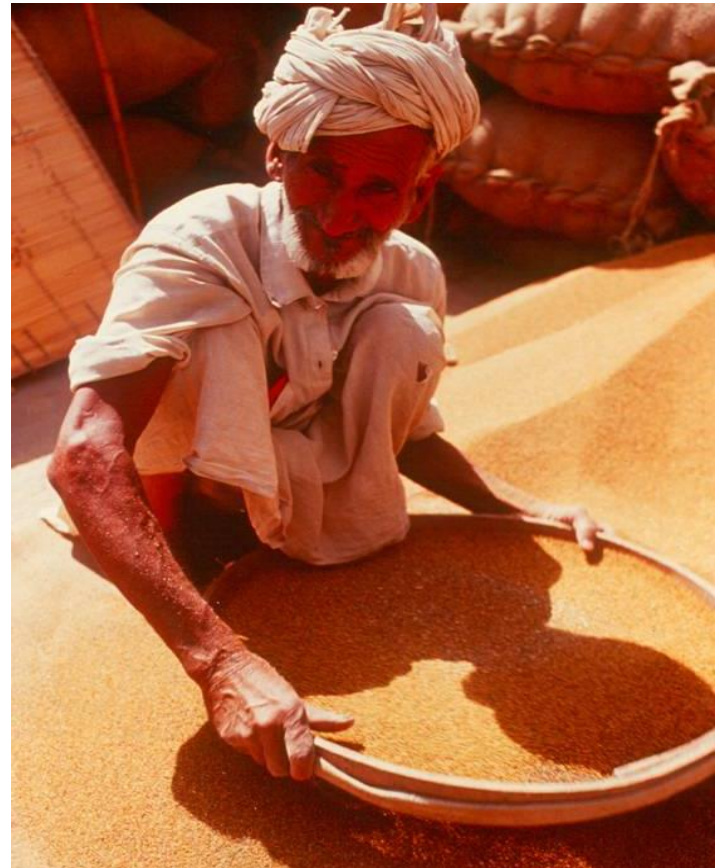


# Zinc wheat 6-month Intervention shows promising results on morbidity in India

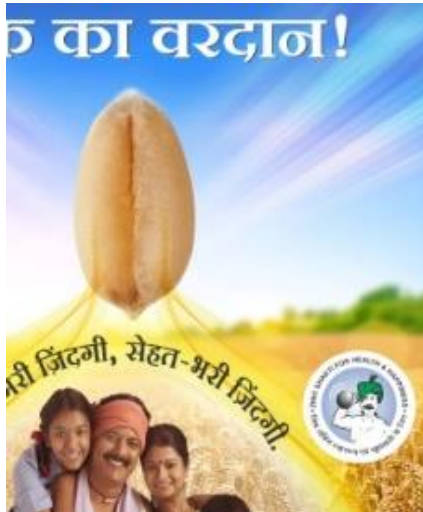


# ***Will Biofortification Work?***

**Will farmers adopt these crops and will consumers buy & eat in sufficient quantities?**



# *Producer & consumer insight research along the value chain*



*Shakti man*



*Develop & Test*

PR Themes & Messaging Brochures ...  
Fact Sheets, ... Brand Development

Product  
Development

Lead ID  
Release

Seed  
Production

Seed  
Marketing

Consumer  
Marketing

Advocacy





# ***Awareness & Demand Creation are Key in Developing Sustainable Markets***



**A mammoth crowd waiting to  
receive stems at the Governor's  
office in Abia, Nigeria**



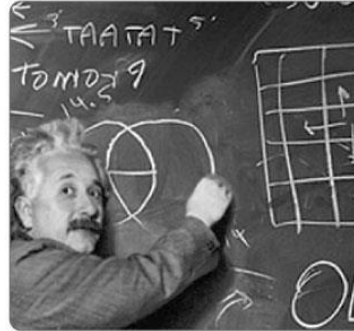
# Marketing - Consumer Goods

Create demand in particular for main channel products such as flour in generating pull in market development



- Advertising
  - Radio
  - TV
  - Print
  - Public service
  - Market Loudspeaker
- Promotional Materials
  - Pamphlets, circulars
  - Brochures
  - Point of purchase (POP)
  - Billboards, banners, posters
- Education/promotion
  - Concerts, street theater
  - Road shows, fairs
  - Health center meetings & training
  - Public sector meetings & training
  - Endorsements
- Premiums
  - T Shirts, hats, bags, pens, etc.

# ***Related Marketing Activities***



## **Metrics**

### ***Measuring Marketing - Sales - PR Effectiveness***





# *Linking Supply & Demand*

Volume & Timely Supply  
Procurement Systems  
Identity preservation  
Quality Control

*Generate Pull*  
Multinational &  
Local Food &  
Milling Companies







**7.5 Million households growing & consuming  
biofortified crops > 35 million household  
members consuming**



# *Advocacy*

**Investment in marketing “Biofortification” and Advocacy at all levels critical for scaling-up**

## **Advocate**

- To mainstream micronutrients in crop development
- To mainstream micronutrients in food systems
- For inclusion of biofortification in national & state policy frameworks as integral part of nutrition agenda
- For a regulatory framework for biofortified crops



**Product  
Development**

**Lead ID  
Release**

**Seed  
Production**

**Seed  
Marketing**

**Consumer  
Marketing**

**Advocacy**



*Thank You!*