

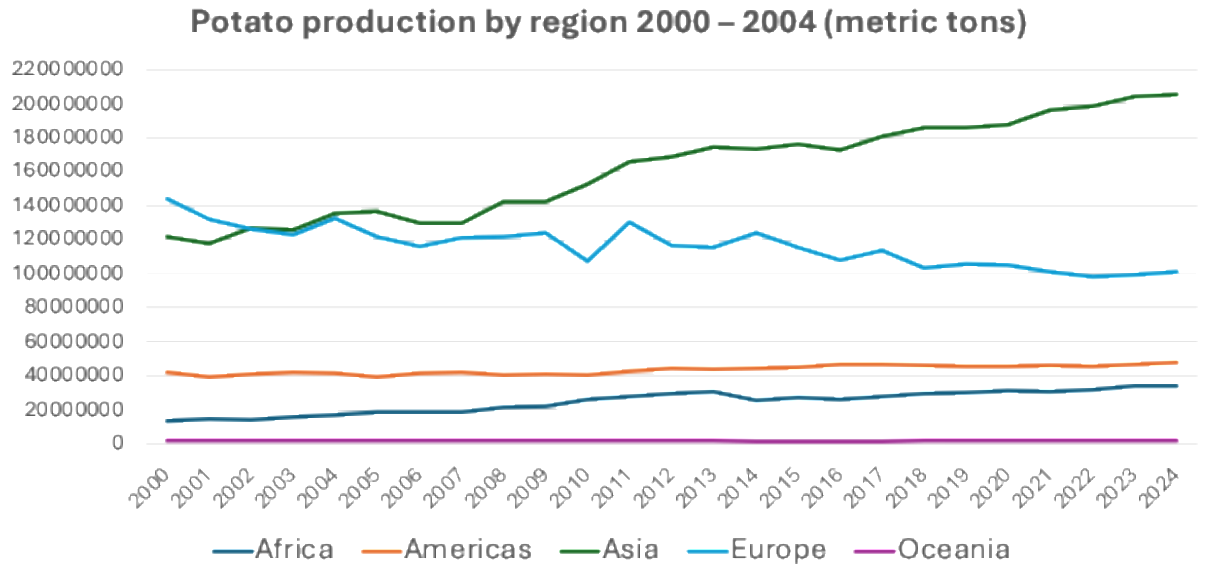
Potato for a Changing World

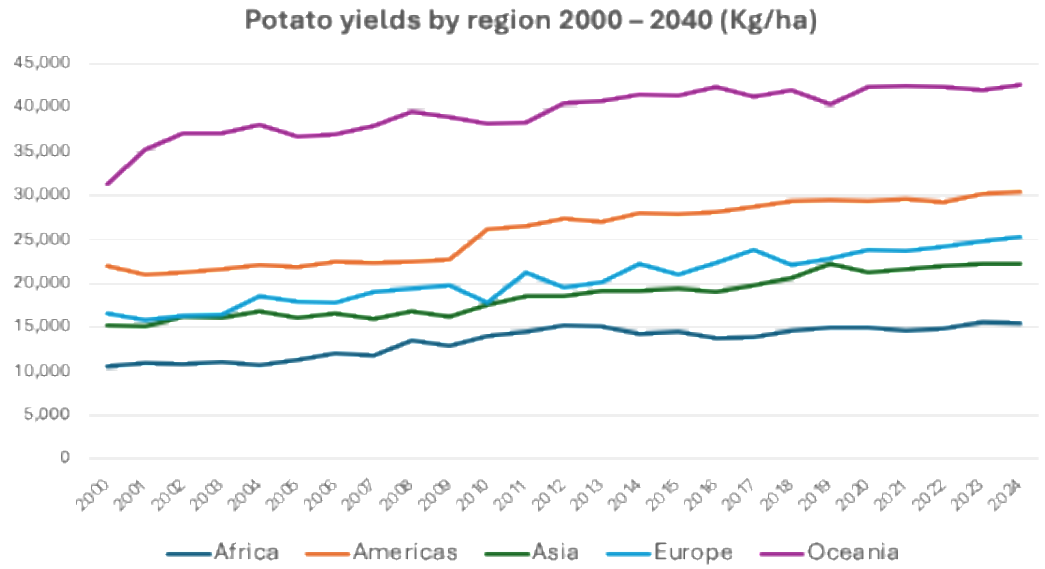
Importance of international science cooperation

Simon Heck, Director General

CIP INTERNATIONAL POTATO CENTER CGIAR

Global trends in potato production





Regional shares in global potato production

	Africa	Americas	**Asia**	Europe	Oceania	World
2000	**4%**	13%	**38%**	45%	1%	323M tons
2024	**9%**	12%	**53%**	26%	1%	390M tons

Yields by region (t/ha)

	Africa	Americas	Asia	Europe	Oceania
2014	14 2	27.9	19.1	22.1	41.4
2024	15.4	30.4	22.2	25.2	42.6
Annual increase	0.67%	1.05%	1.36%	2.11%	0.39%

Regional growth in Africa, Asia and Latin America

Annual growth rates of production (2014 - 2024) (based on MT production)				
	Africa	South Asia	East & Central Asia	Latin America
Potato	**+ 2.5%**	**+ 2.0%**	**+ 1.4%**	**+ 1.4%**







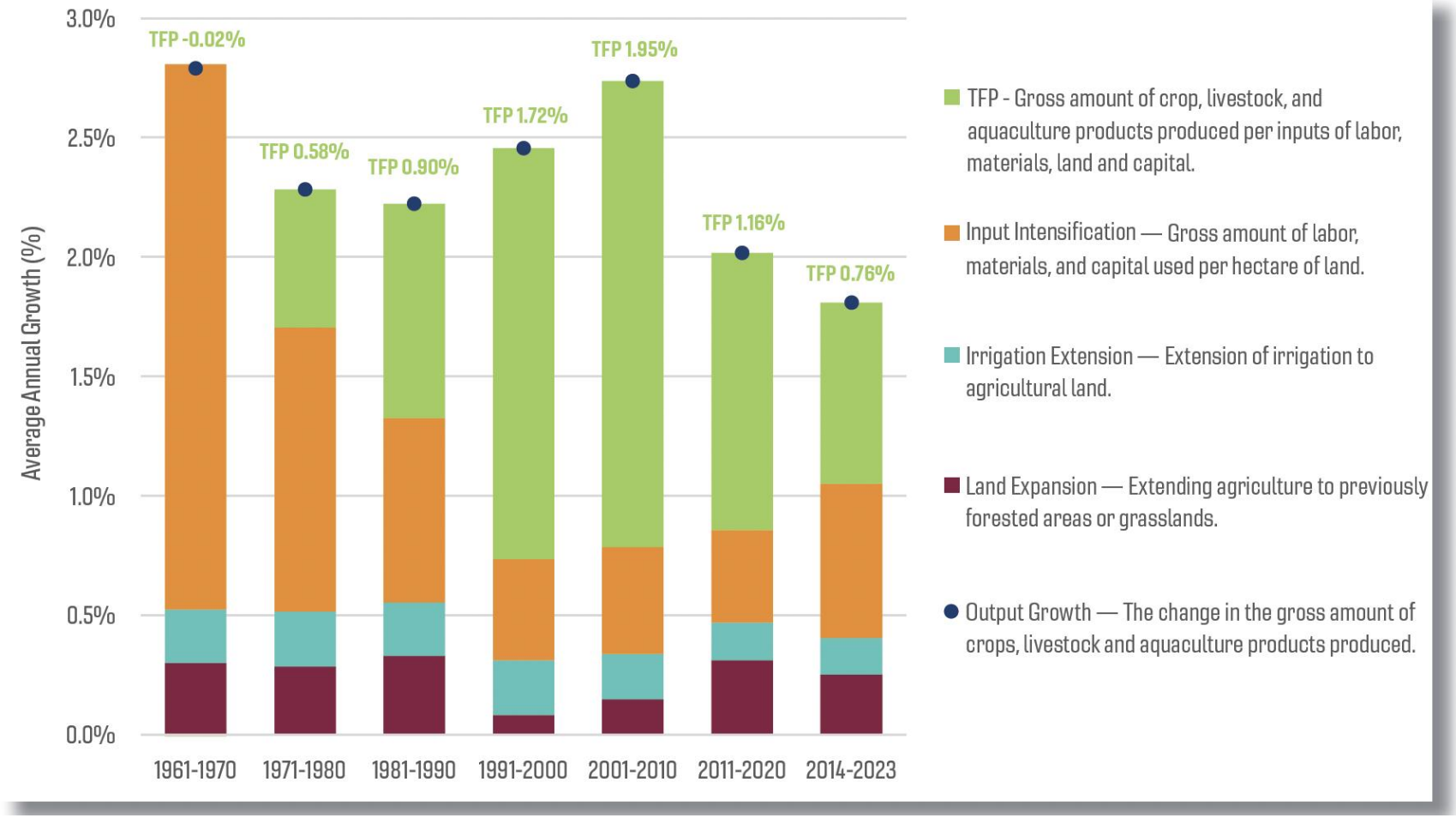
Key observations

- Growth in Africa, Asia and Latin America
  - Within these regions, into more tropical environments
  - From highlands to lowlands
- Growth mainly based on area expansion
- Yields improving only slowly (and unstable)
  - Climate change impacts
  - New production areas

➢ **Questions about the sustainability of the current growth**

The sustainability of global food security is at risk

Figure 3. Global Sources of Agricultural Output Growth, 1961-2023



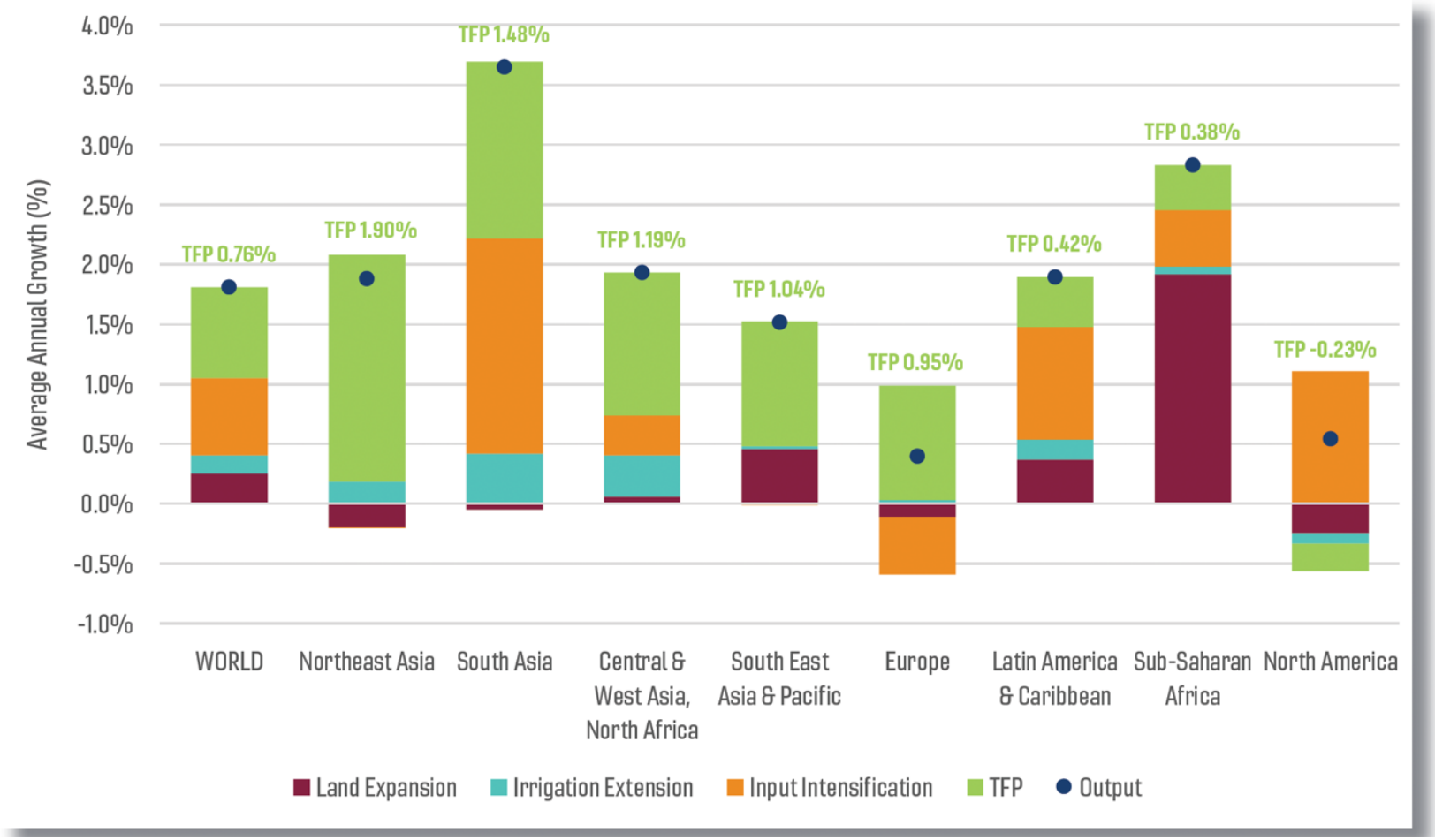
Source: USDA, Economic Research Service, International Agricultural Productivity Data, 2024. Quoted in Global GAP Report 2025.

- **Global agricultural output growth** is slowing since 2010
- **Total Factor Productivity gains** are smallest since the 1970s

➢ **Wake-up call for agricultural science & innovation globally**

The sustainability of global food security is at risk

Figure 4. Sources of Agricultural Output Growth by Region, 2014-2023



Source: USDA, Economic Research Service, International Agricultural Productivity Data, 2024. Quoted in Global GAP Report 2025.

Regional Breakdown

- **Total Factor Productivity gains > 1% only in Asia**
- Africa's growth largely based on area expansion

➢ **Need for more effective technologies and practices in almost all regions**

Potato sector dealing with similar constraints



- Access to quality, clean seed
- Lack of locally adapted varieties
- Limited mechanization
- Increased biotic and abiotic stresses from climate change
- Limited investment in science and technology and technical and business services

But the picture is starting to change ....

- Science is stepping up
- Policies are becoming more progressive
- Investments are increasing

Diploid hybrid potato is getting within reach



Foliage assessment, KALRO Tigoni



Crossing block, KEPHIS Muguga

Source: HZPC 2026

KENYA

Public – Private Partnership

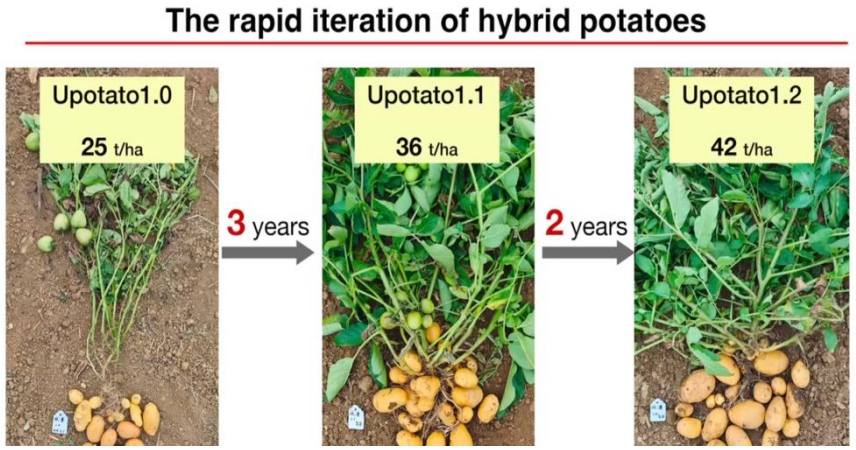
2028–29:

- Diploid hybrids will be field tested and true seed and seedling systems will be developed in partnership with local seed companies

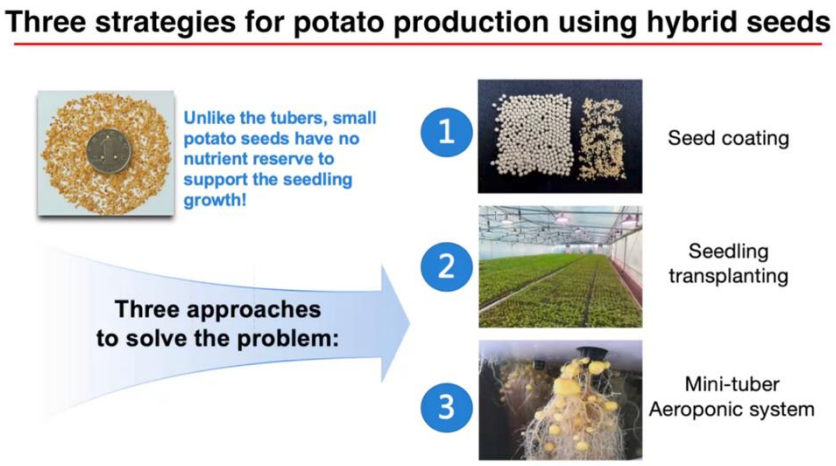
2030:

- First cohort of diploid hybrids will be included in national trials in East Africa leading to their registration and launch.
- Elite diploid parents will be licensed to seed companies, and true seed will reach farmers.

Diploid hybrid potato is getting within reach



Source: AGIS 2026



Source: AGIS 2026

CHINA

Agriculture Genomics Institute at Shenzhen (AGIS) of the Chinese Academy of Agricultural Sciences (CAAS)

Sharing the methodology and germplasm with Asia and Africa

Global Hybrid Potato Alliance (GHPA) launched in 2023

MoU CIP – AGIS signed in 2026

Ethiopia -China Cooperation Project

- Transfer of Upotato 1.2 clone
- SMTA in place
- Supported by the FAO South-South Programme

Diploid hybrid potato is getting within reach

The Reinvention of Clonal Crops Consortium

1. Root, tuber and banana (RTB) crops

Potato	Agricultural Genomics Institute at Shenzhen, CAAS International Potato Center (CIP)
Sweetpotato	International Potato Center (CIP) Xuzhou Institute of Agricultural Sciences
Banana	Institute of Tropical Bioscience and Biotechnology, CATAS International Institute of Tropical Agriculture (IITA)
Cassava	Brazilian Agricultural Research Corporation, Embrapa Tropical Crops Genetic Resources Institute, CATAS International Institute of Tropical Agriculture (IITA)

Alfalfa	Apple
Coffee	Citrus
Mushroom	Grapevine
Tea	Kiwifruit
Oil palm	Peach
Rubber tree	Pear
Sugarcane	

Beyond potato:

***R**einvention **O**f **C**lonal **C**rops (**ROCC**) Consortium*

- >30 research institutions from 15 countries in Asia, Africa, Europe, North and South America, Oceania
- Goal: to turn all major clonally propagated crops into seed crops
- Scope:
  - Initial focus on 17 crops (then 45)
  - Roots, Tubers, and Bananas are main food security crop group
  - Potato is leading the way

"Laying a new cornerstone for global food security"

Potato genetic resources become easier to access

Crops-to-Go: the whole genebank, within reach

An AI-guided way for researchers and breeders to request potato, sweetpotato and Andean root & tuber germplasm from the CIP Genebank

FOR THE USER

16,600+

accessions open to every request

Search the full collection by trait, origin and target climate — not just the accessions curators know best.

HOW IT WORKS

Days

not 60–90 days of emails

Filters, climate matching and an LLM rank and explain candidates; a curator validates every recommendation.

IMPACT & SCALE

85

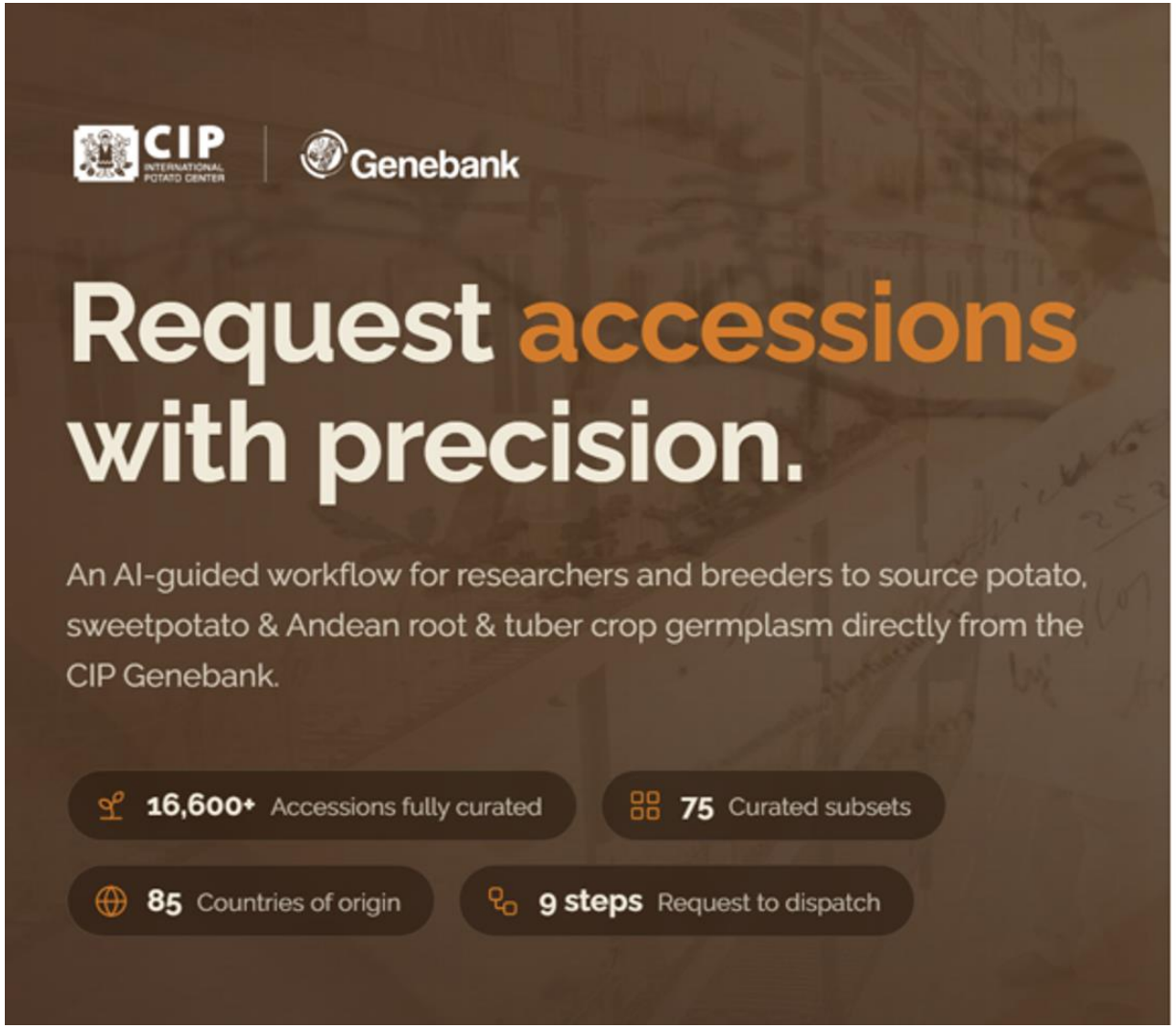
countries of origin, 75 curated subsets

Target: 80% fewer back-and-forth emails, with rare accessions recommended alongside familiar ones.

Developed with CGIAR GENEBANKS CGIAR DIGITAL TRANSFORMATION aws

crops-to-go.cipotato.org

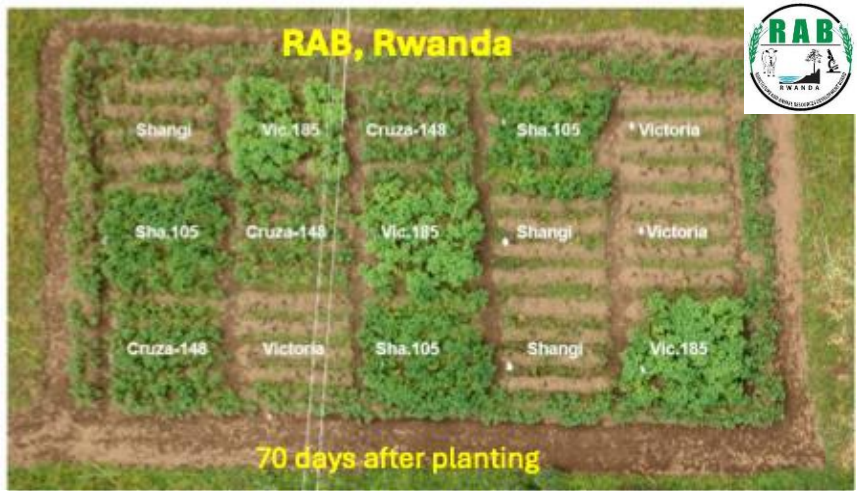
Potato genetic resources become easier to access



crops-to-go.cipotato.org
Scan to access Crops-to-Go

https://crops-to-go.cipotato.org/

Biotech Late Blight Resistance in Potato for Africa





Late Blight costs:

- Up to 70% yield losses
- About 20 sprays per season (> $1bn /yr in Africa)
- Up to 40% of production costs
- High exposure to pesticides

Biotech stack of 3 resistance genes from potato wild relatives:

- ***Rpi-blb1*** and ***Rpi-blb2*** from *Solanum bulbocastanum*
- ***Rpi-vnt1.1*** from *Solanum venturii*

Research work under way in:

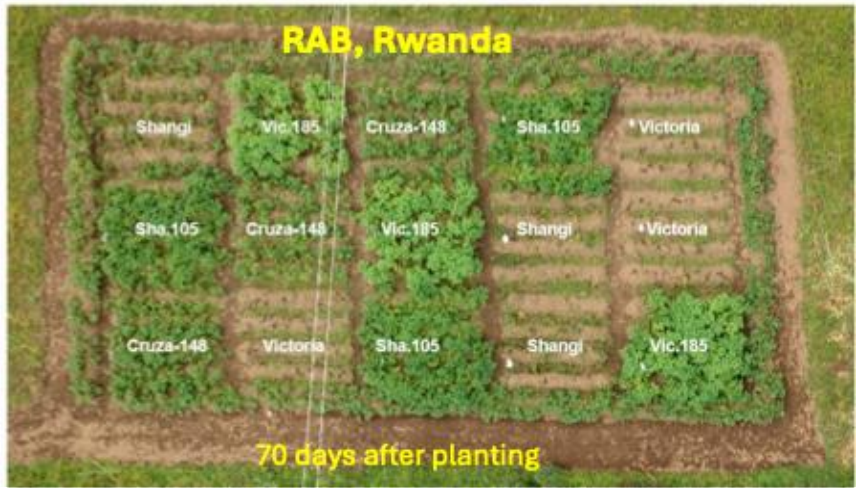
- Rwanda, Kenya, Uganda



Transgenic 3R Victoria **Conventional Victoria**

Grown without fungicide (Uganda)

Biotech Late Blight Resistance in Potato for Africa





REPUBULIKA Y'U RWANDA
REPUBLIC OF RWANDA

RICA Rwanda Inspectorate, Competition and Consumer Protection Authority

Decision of 23 October 2026:

In compliance with Law № 025/2024 Governing Biosafety, two potato genetically modified candidate varieties **officially released for registration:**

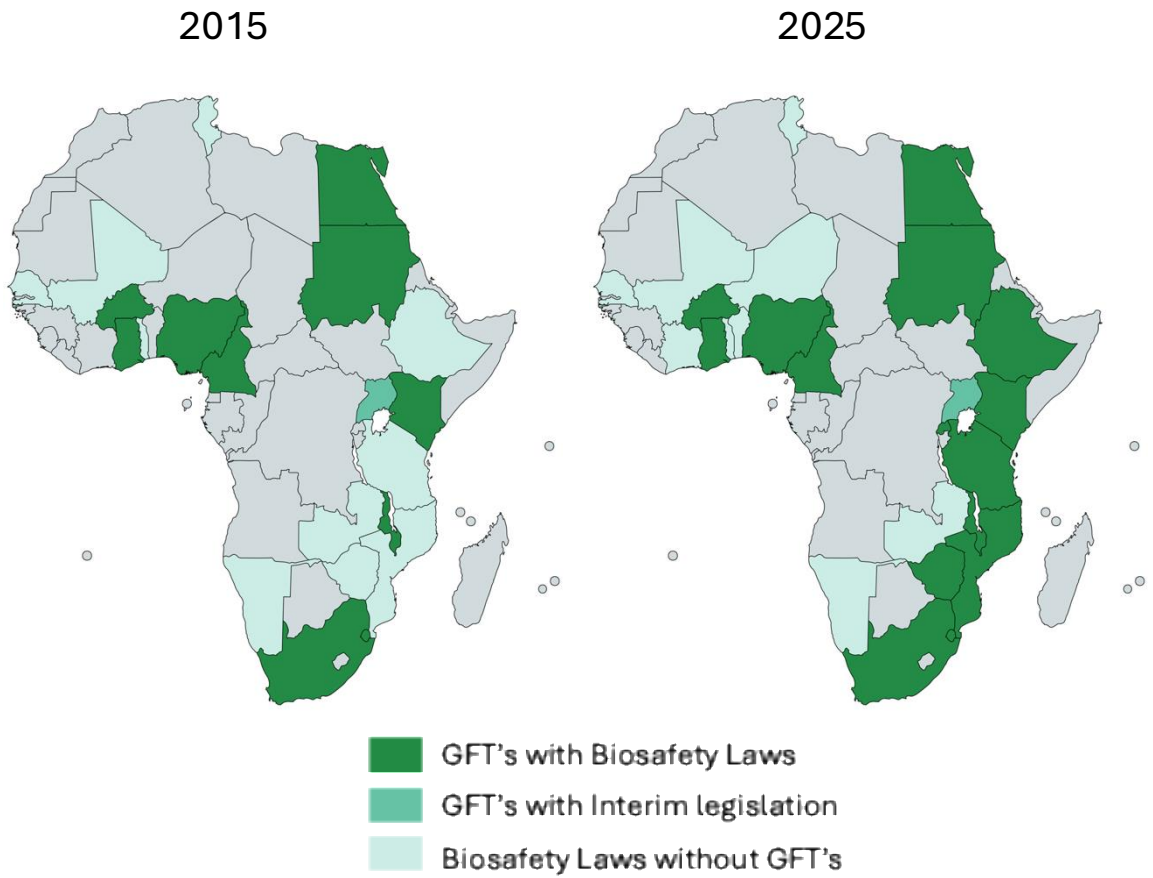
1. **Sha. 105 (Ndamirandahangarwa)**
2. **Vic. 185 (Victoriandahangarwa)**

- high tolerance to Late Blight; and
- yield potentials of 35 to 45 t/ha without fungicide application
- included in National Plant Variety List 2026 for statutory publication

Testimony to:

- Africa's leadership in agricultural development
- Value of international science cooperation
- Importance of crop genetic diversity

Progressive Policy and Investment Environment



Source: AU-NEPAD Africa Biosafety Network of Expertise (ABNE), 2015 and 2025

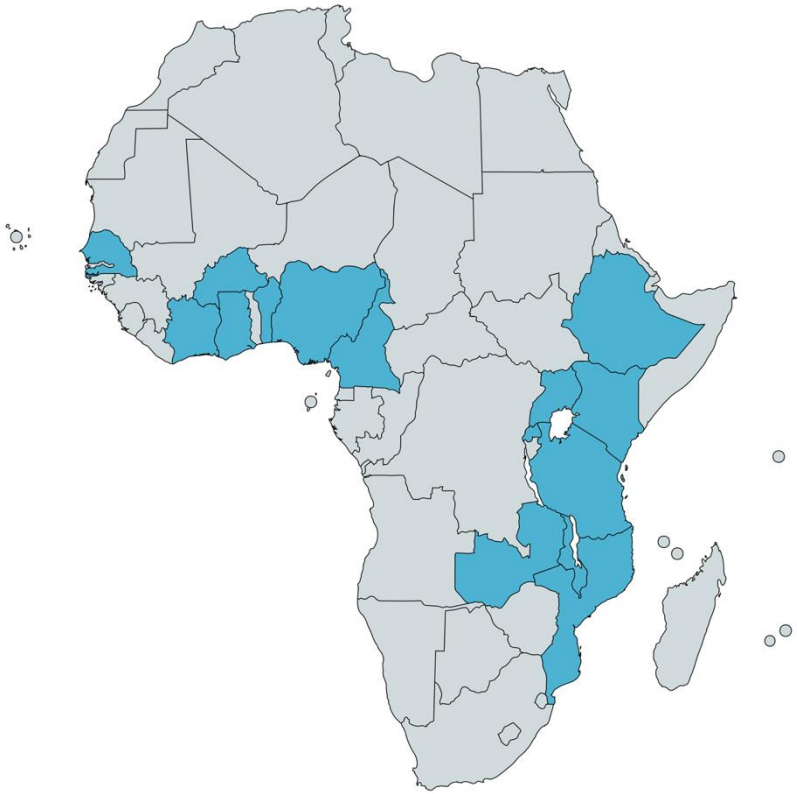
Biosafety legislation and policies enabling GM crop commercialization

Potato biotechnology prioritized in:

- Rwanda
- Kenya
- Ethiopia
- Nigeria
- Uganda

Progressive Policy and Investment Environment

New (First) National Strategies and/or Investment Plans for the Development of Root and Tuber Crops since 2020



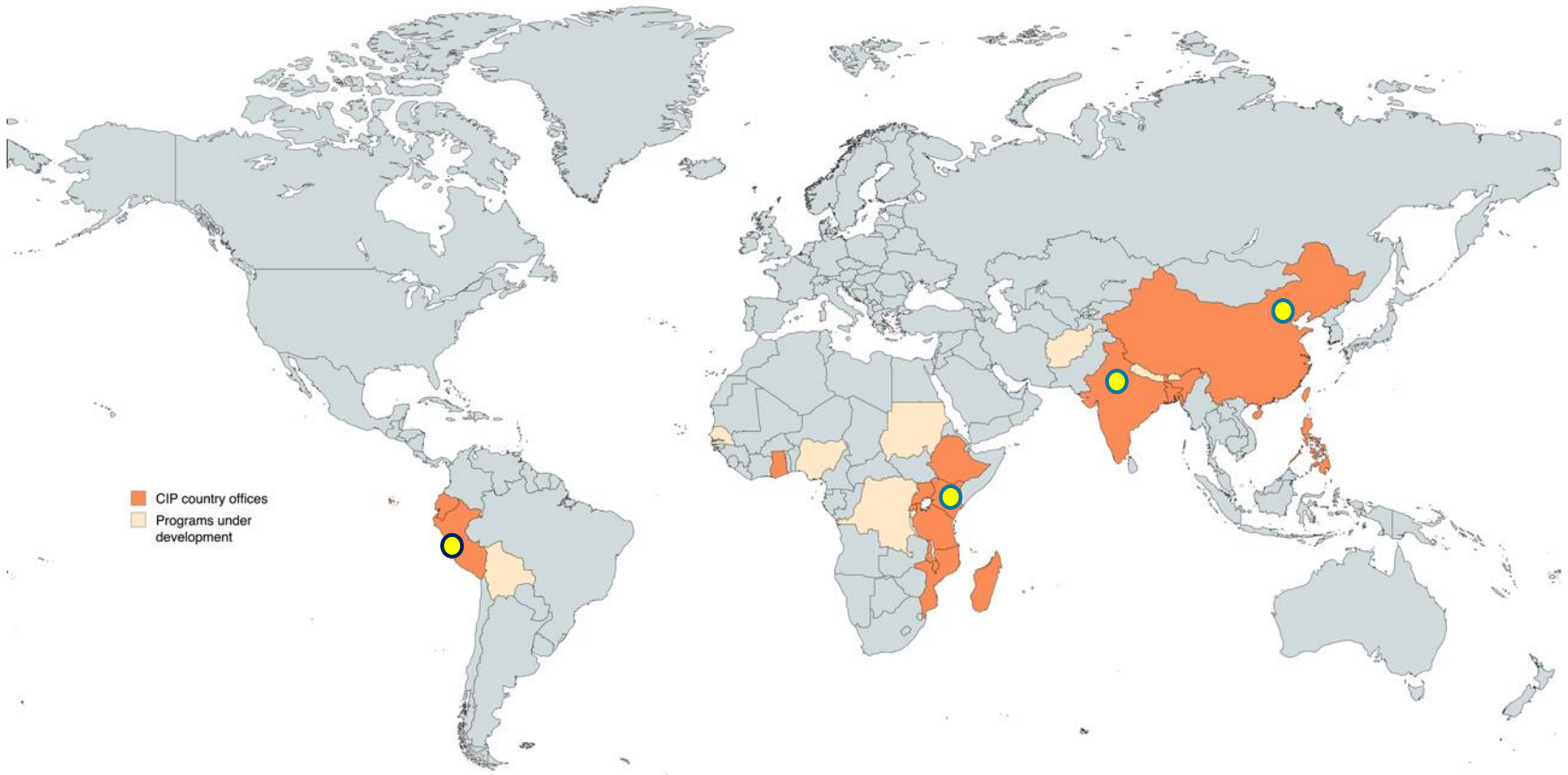
Source: CIP

Multi-lateral Development Banks/ International Finance Institutions are supporting potato sector development:

- Sovereign loans
- Trade finance
- Private sector
- Co-financing
- Multi-financier platforms

➢ Grants for technical platforms ("knowledge academies") for Root and Tuber Crops

CIP – expanding our regional partnerships



HQ Lima, Peru (since 1971)

Global multi-lateral organization

Presence in 21 countries and additional partner-led programs

Regional Hubs

- CIP Africa Center, Nairobi, Kenya
- CIP China Center for Asia Pacific (CCCAP), Yanqing, Beijing
- CIP South Asia Regional Center (CSARC), Agra, India
- CIP Latin America, Lima, Peru

CIP – expanding our regional partnerships

Inauguration
Early 2027





New CIP South Asia Regional Center (CSARC)

- 50 years of CIP in India
- Long-term agreement with Government of India
- India, Bangladesh, Nepal, Bhutan
- Located in Agra, Uttar Pradesh (“heart of the potato belt”)
- Platform for science and innovation in potato, sweetpotato, and other root and tuber crops
- Private and public sector partners
- South-South and global cooperation



Thank you * Asante sana

CIP INTERNATIONAL POTATO CENTER

CGIAR

The International Potato Center (CIP) was founded in 1971 as a research-for-development organization with a focus on potato, sweetpotato and Andean roots and tubers. It delivers innovative science-based solutions to enhance access to affordable nutritious food, foster inclusive sustainable business and employment growth, and drive the climate resilience of root and tuber agri-food systems. Headquartered in Lima, Peru, CIP has a research presence in more than 20 countries in Africa, Asia and Latin America.

www.cipotato.org

CIP is a CGIAR research center, a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector.

www.cgiar.org

CIP thanks all donors and organizations that globally support its work through their contributions to the CGIAR Trust Fund: www.cgiar.org/funders

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