Deployment through direct use

World Vegetable Center

INTERNATIONAL YEAR OF FRUITS AND VEGETABLES 2021

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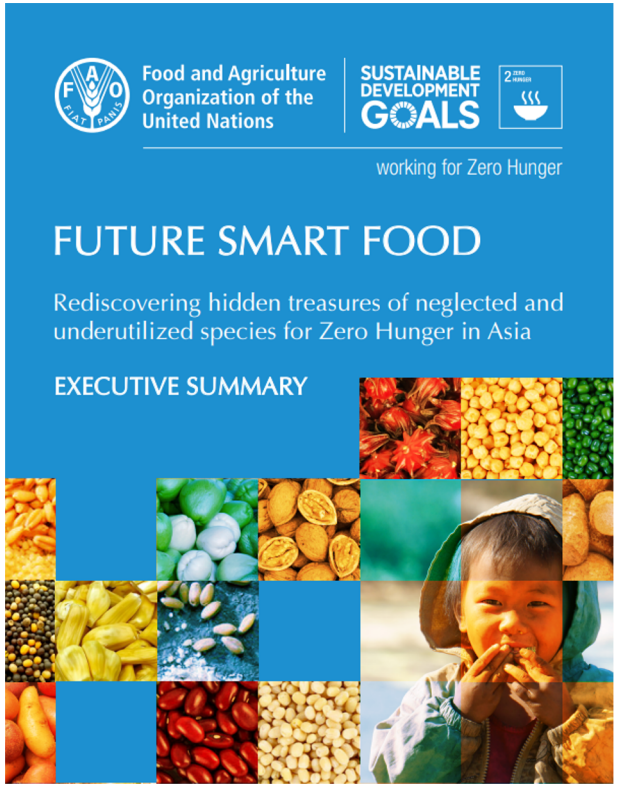
Deployment through direct use

- Complements deployment through germplasm breeding pipelines
- Relevant in specific situations (Westengen et al. 2017)
  - Reintroduction
  - Strengthen farmers' rights by supporting participatory plant breeding
  - Increase germplasm access for countries and organizations with low breeding and storage capacity
  - Emergency seed interventions
  - Variety introduction
- Relevance for specific genebanks depends on objectives, crops, and targeted user groups
- Could support planting material availability for emerging markets for nutritious foods with low breeding efforts

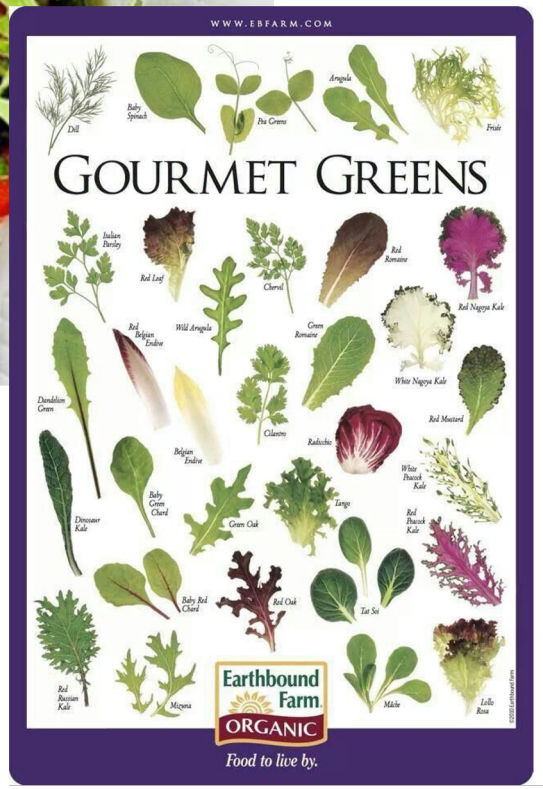
A new generation of nutritious foods to diversify diets and farm systems



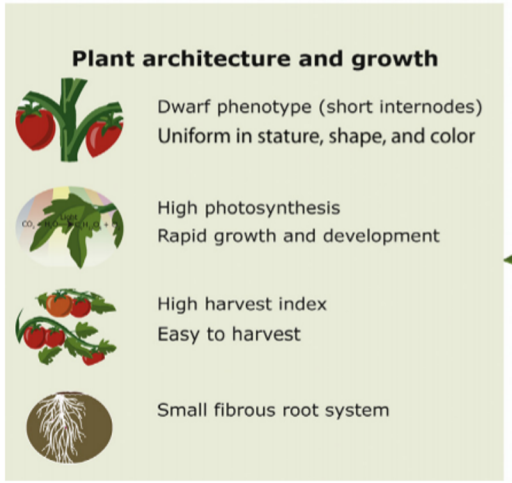
Low breeding and seed supply efforts limit planting material availability for many nutritious foods
-> Genebanks could play an active role in seed system development for these crops

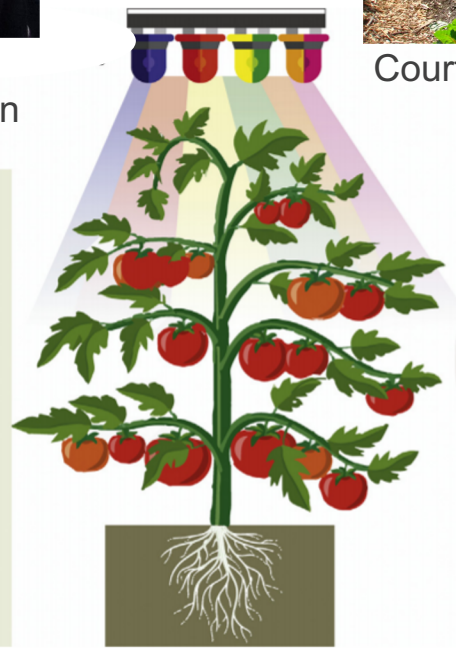
Global trends in urbanization require new genetic resources for production and consumption

Courtesy: Kgbo, Wikiwand

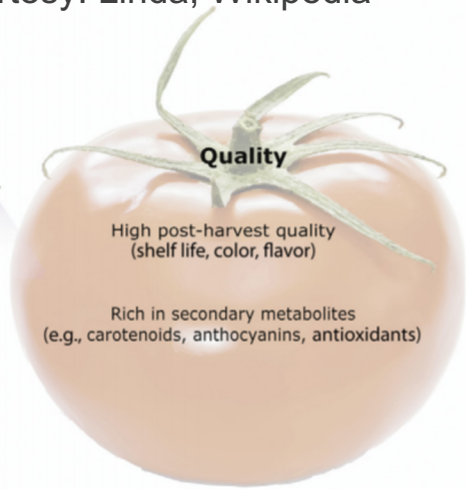


Courtesy: "YesHealth" Agri-Biotechnology Co. Ltd, Taiwan





Courtesy: Linda, Wikipedia



SharathKumar et al., 2020, Trends in Plant Science

Germplasm sources for nutritious vegetable crops

Key numbers of the WorldVeg genebank

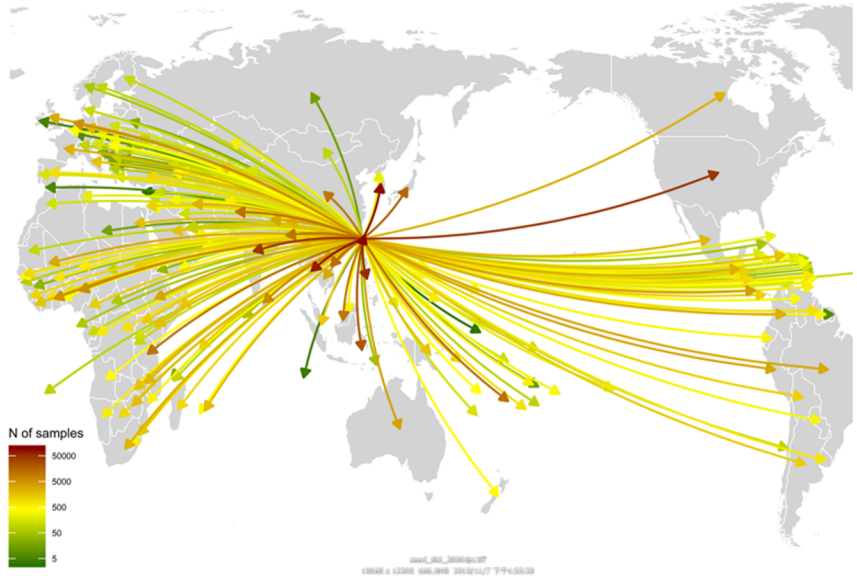
~ 65,000 accessions

> 450 species

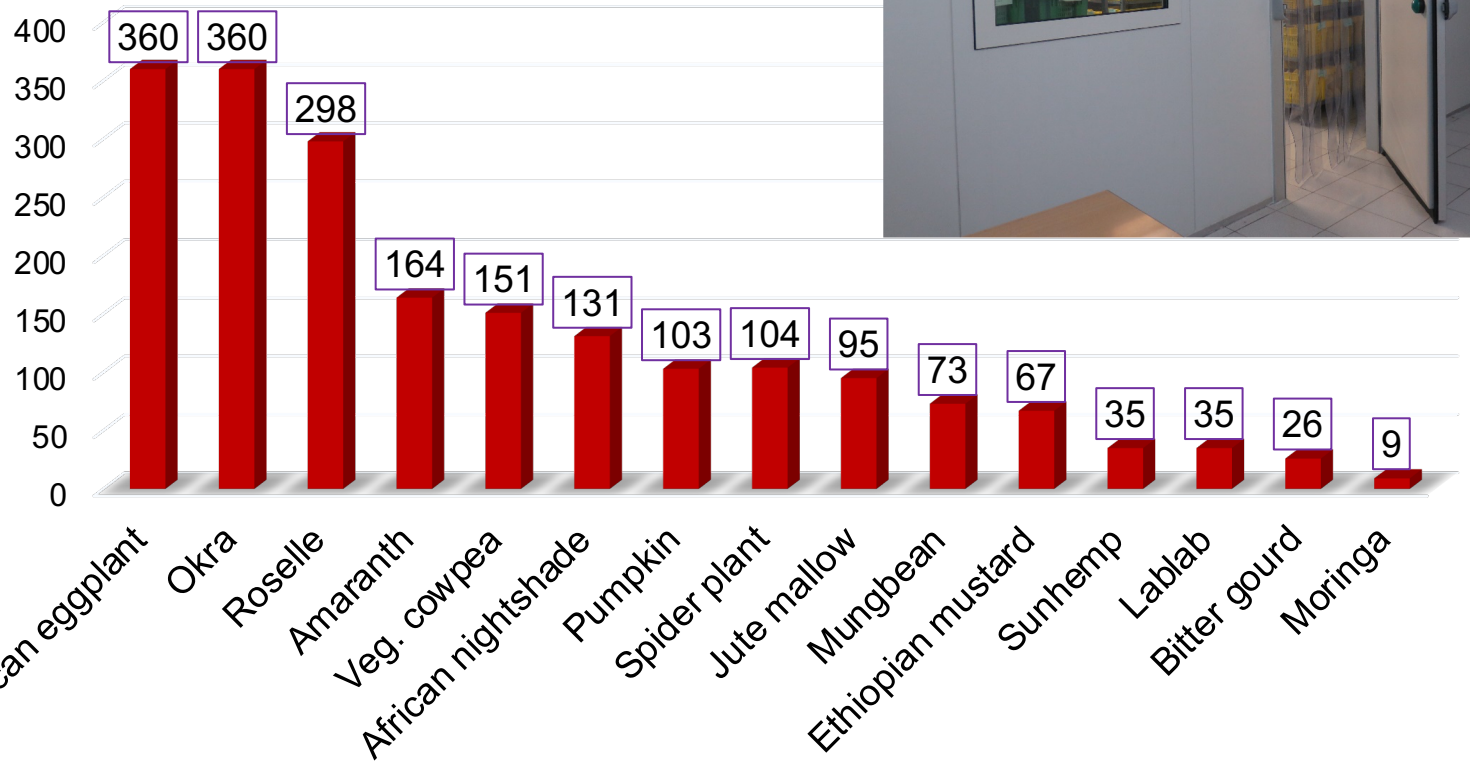
> 150 countries of origin

> 690,000 samples sent to 204 countries

> 12,000 accessions of traditional Asian vegetables



Regional genebank of traditional African vegetables



Distribution of vegetable seed kits to farmers

Over 47,078 **seed kits** and over 210,907 **seed samples** of WorldVeg germplasm distributed by scaling partners to farmers in east Africa between 2013 and 2020

Popular traditional vegetables included in seed kits:


AMARANTH


JUTE MALLOW


SPIDER PLANT


AFRICAN NIGHTSHADE


COWPEA LEAVES


AFRICAN EGGPLANT


ETHIOPIAN MUSTARD


OKRA

Collaboration with the private sector
Africa Vegetable Breeding Consortium

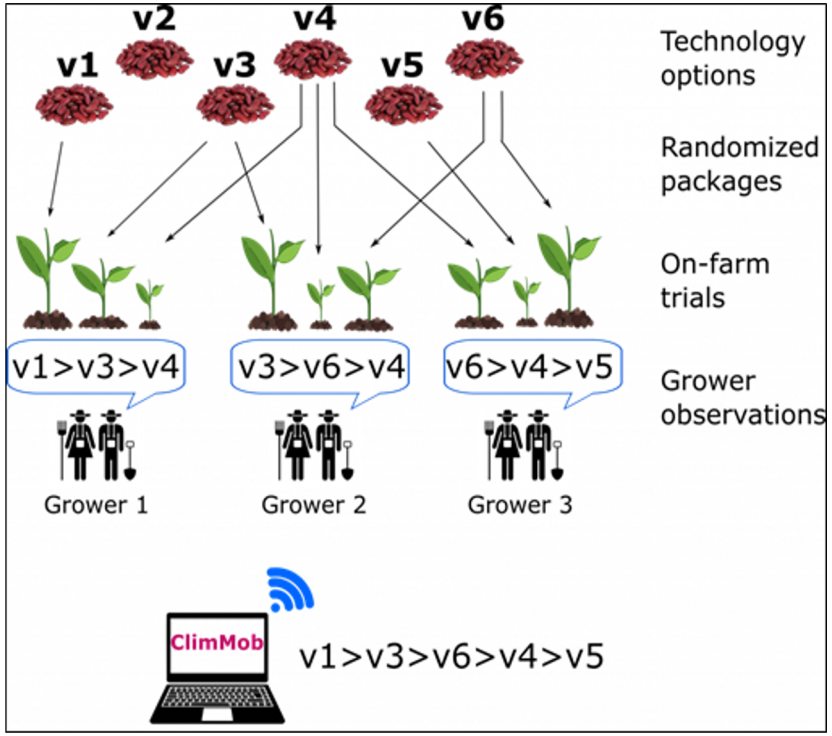
- Currently 38 members
- Dialogue with breeding community
- Capacity building of seed enterprises
- Coordinated evaluation of breeding material
- Scaling seed production of improved lines

Priority crops

- African traditional vegetables
- African eggplant
- Amaranth
- Pepper (Chili and Sweet)
- Tomato
- Pumpkin
- Onion
- Mungbean

Choose, Grow, Thrive - Citizen science for African vegetables

- Countries: Benin, Mali, Tanzania
- Farmers as “citizen scientists”
- Connect genebanks and seed companies with local seed systems and farmer needs
- Connect to consumer preferences and food environments



BMZ Federal Ministry for Economic Cooperation and Development

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

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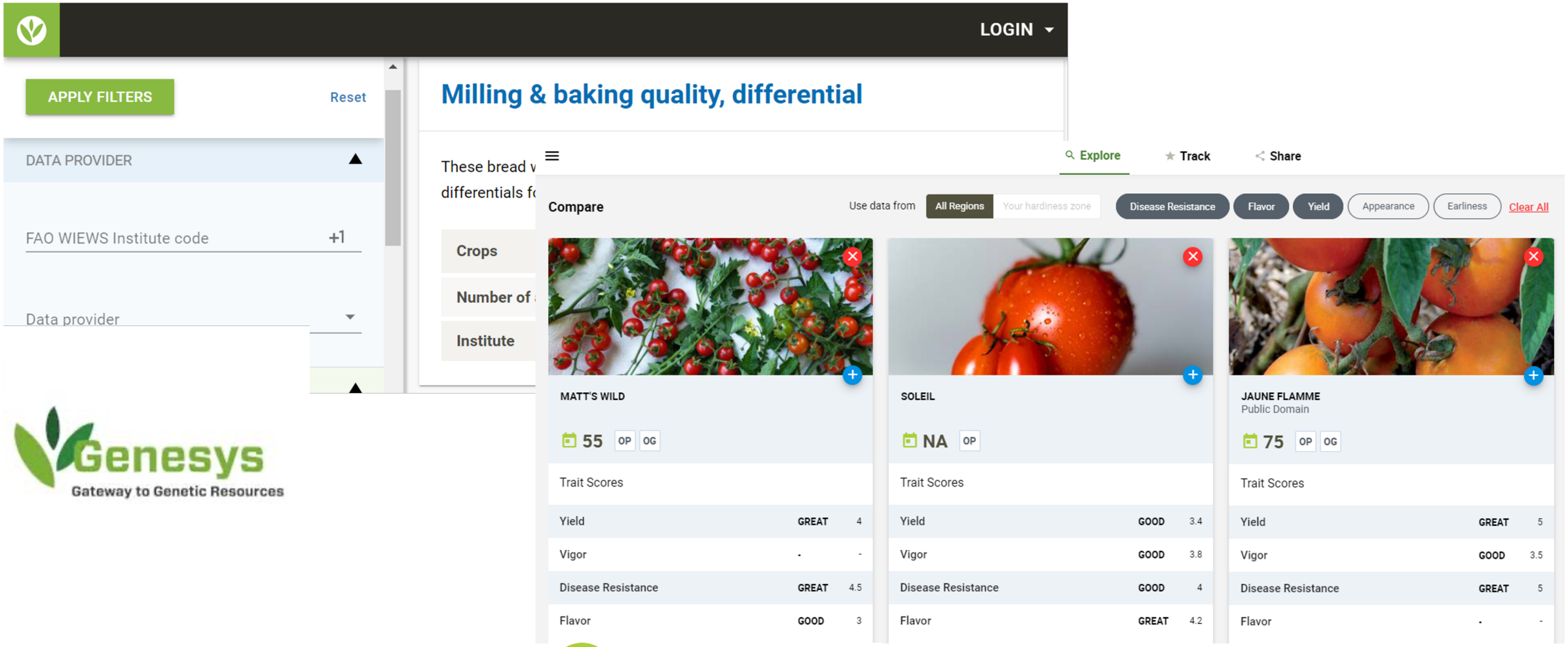
Information sharing platforms to reach different users



Genesys
Gateway to Genetic Resources

SeedLinked

Steps to stimulate deployment of germplasm of African vegetables

- Development of subsets of promising material for further evaluation and breeding
- Co-operation and partnerships among genebanks, breeders, seed multipliers, and distributors
- Establishment of platforms for germplasm and trait information sharing and seed requests
- Application of tools to collect and share information about traits and germplasm performance among farmers, seed suppliers, and genebanks

Conclusions

- By applying different ways of deployment, genebanks can reach a wide range of user groups and scaling partners
- Scaling seed supply of crops with low breeding efforts requires active co-operation of genebanks with seed system actors
- Technological advances in sharing germplasm and trait information allows genebanks to reach more users and in a better way

Thank you!

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