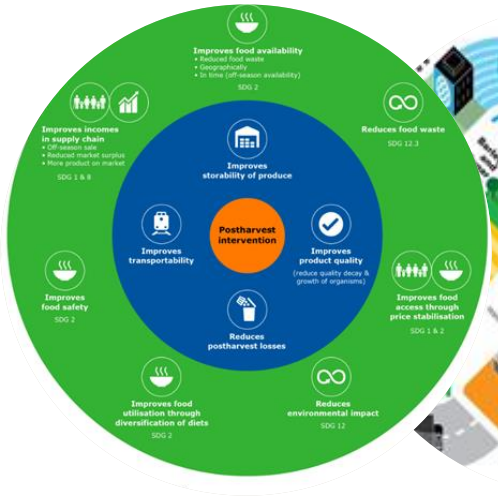
Food loss & waste

West Nile Innovation hub seminar, October 14th 2021

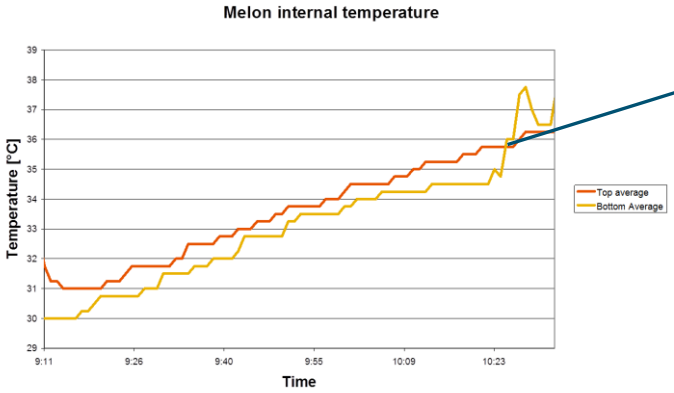
Bas Hetterscheid, René Oostewechel - Jan Verschoor jan.verschoor@wur



WAGENINGEN
UNIVERSITY & RESEARCH

Story of wasted melons

Main lesson: Treat your products as they prefer to be treated



Optimal handling conditions:

- 7-10°C and 85% humidity

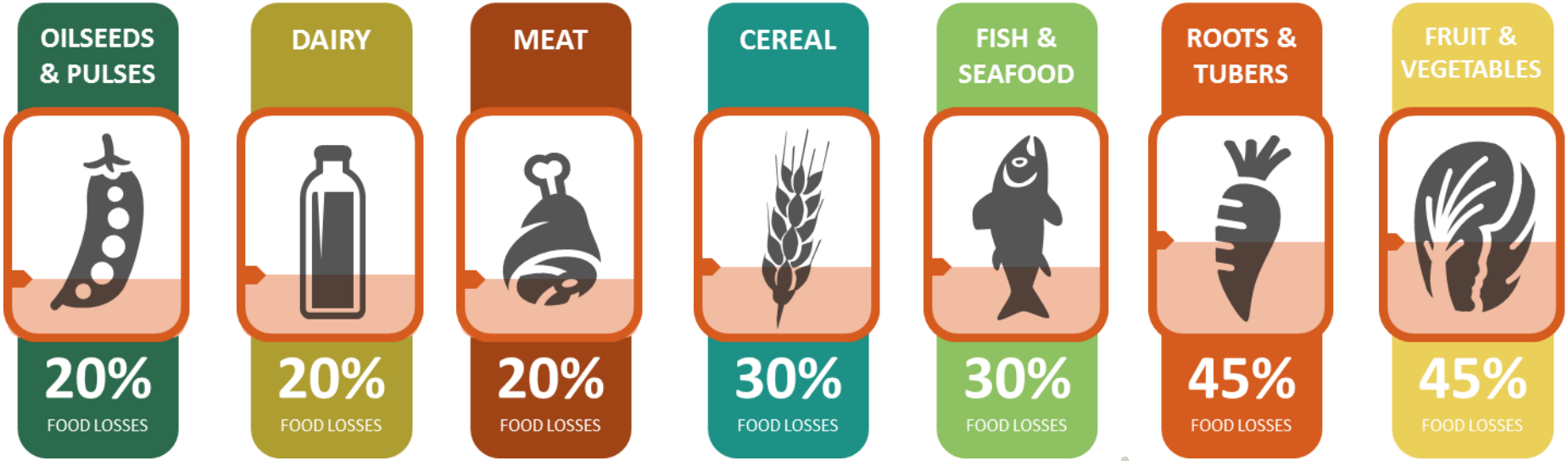
WAGENINGEN
UNIVERSITY & RESEARCH

FLW in regenerative perspective

- The goal of a regenerative food system entails that in the end there is a net positive environmental impact in the food system.
    - Not only production

- Value chains play a vital role is connecting supply and demand and also in preservation of food produced
    - Value chains have impact as well
    - Food loss and waste prevention

1/3rd of all food produced is lost or wasted



How sustainable is it to throw away 45% of what we produce?

WAGENINGEN UNIVERSITY & RESEARCH

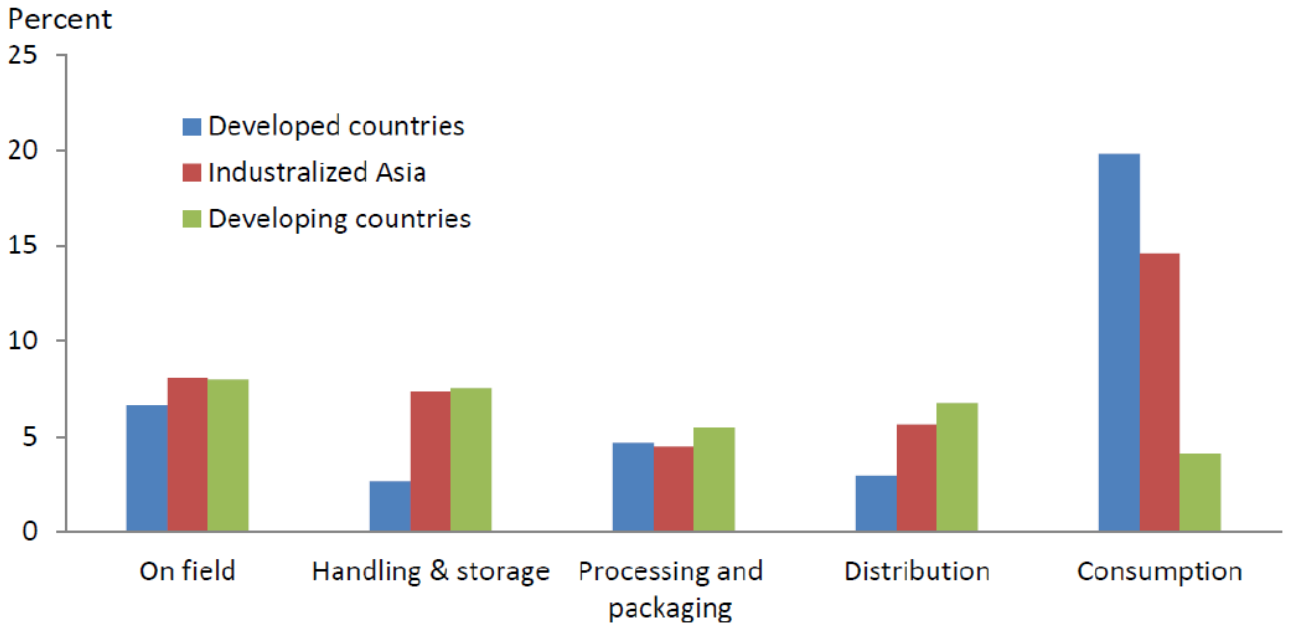


Figure 8. Food losses vary by the stage of supply chain across countries (Source: Aulakh et al. (2013))

Fight against food loss

1. SAVE MONEY

An analysis of 700 companies in 17 countries found that investing in food loss and waste reduction yielded a 14-fold return.

COMPANIES

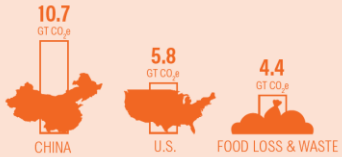
−	+
EVERY **$1** INVESTED	YIELDS **$14** IN RETURN
Measuring waste	Selling imperfect produce
Training staff	New products
Buying storage equipment	Reducing waste management costs
Changing packaging	Avoiding cost of food not sold

2. FIGHT HUNGER

The world throws out **1 billion tons** of food each year while **1 in 9 people globally remain malnourished**.

3. CURB CLIMATE CHANGE

Food loss and waste produces **8% of global greenhouse gas emissions**; if it were its own country it would be world's **third-largest emitter.**



4. CONSERVE RESOURCES

It takes a **China-sized amount of land** to grow food that's ultimately lost or wasted.

5. IMPROVE REPUTATION

Reducing food loss and **waste** improves relationships with customers, vendors and other stakeholders.

6. COMPLY WITH LAWS

Government agencies and **companies** sometimes must adhere to regulations on disposing organic waste, including food.

7. UPHOLD ETHICS

Executives, staff and consumers increasingly recognize food loss and waste reduction as "**the right thing to do.**"

WAGENINGEN UNIVERSITY & RESEARCH

CHAMPIONS 12.3

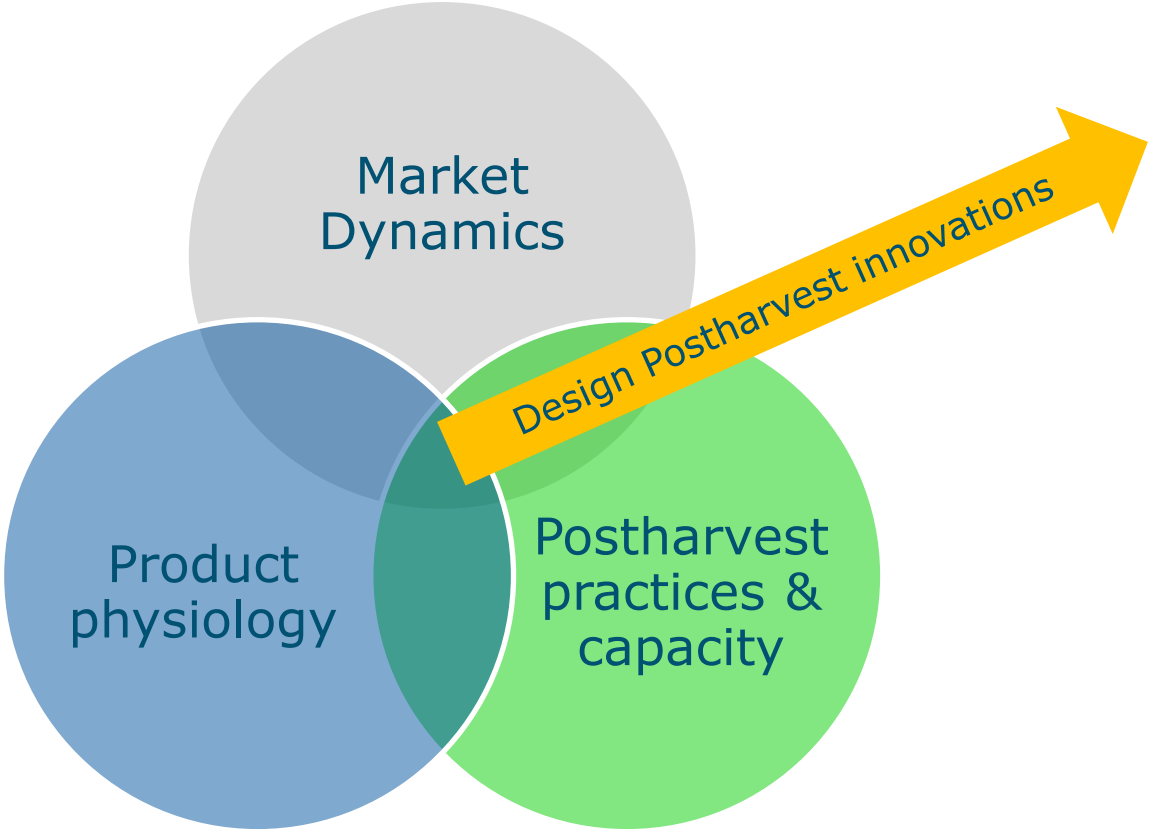
Our motto

It’s easier to decrease food loss by 5%,
than to increase food production with 5%.

How?
Let’s start our learning journey!

Success of Food loss and waste innovations

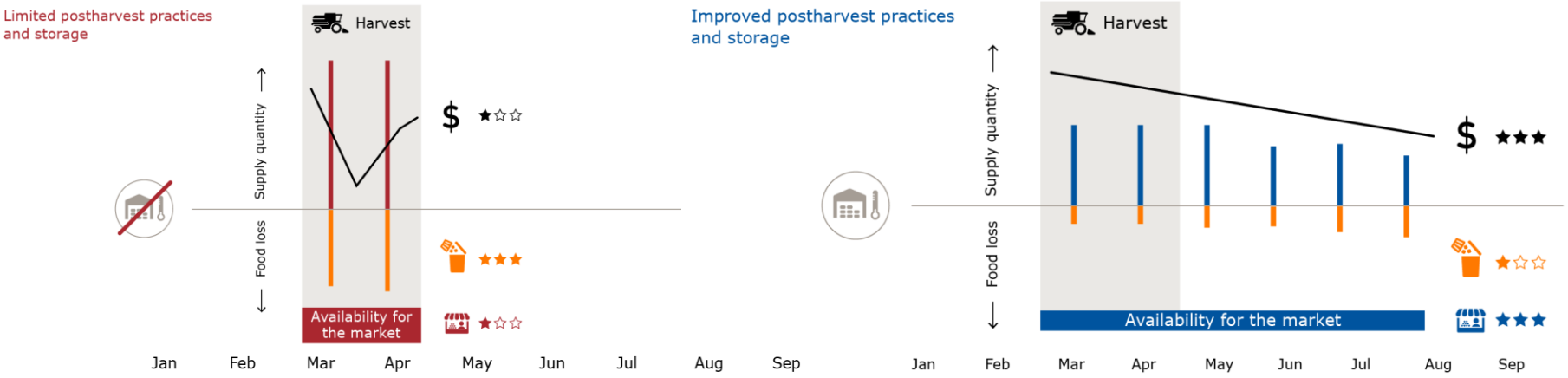
Designing postharvest innovations



Market dynamics of FLW

- FLW interventions = added value
  - Cost money
- Can these cost be absorbed in the market?
  - Demand for more products
  - More distant markets
  - Higher price?

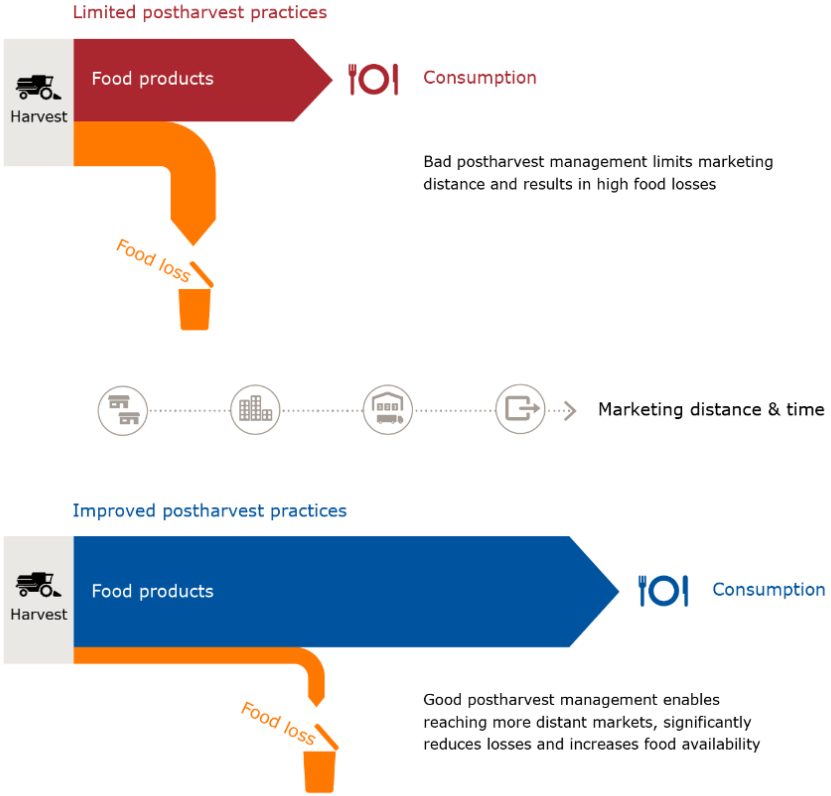
Illustrative effect of postharvest management on food availability and price development



Source: Verschoor, et al. (2020): Postharvest interventions, key for improvement of food systems

https://www.wur.nl/en/article/White-paper-on-how-postharvest-interventions-contribute-to-improving-food-systems.htm

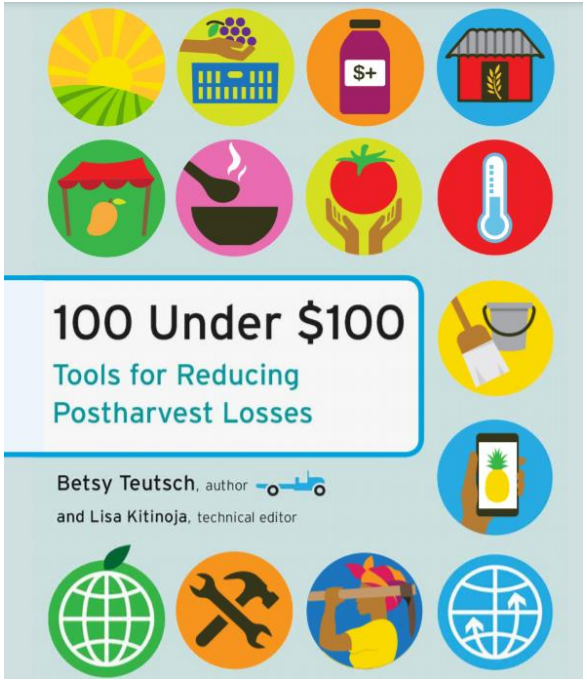
Effect of postharvest management on food loss in perishables



Source: Verschoor, et al. (2020): Postharvest interventions, key for improvement of food systems

https://www.wur.nl/en/article/White-paper-on-how-postharvest-interventions-contribute-to-improving-food-systems.htm

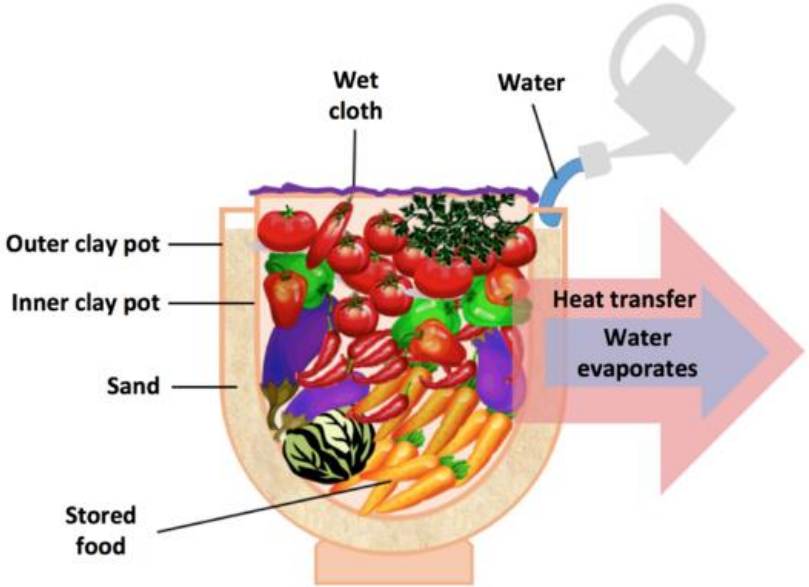
Food loss and waste prevention innovations



WAGENINGEN
UNIVERSITY & RESEARCH

Source: 100 under $100 Postharvest tools:
http://postharvest.org/100_under_100_Postharvest_Tools_Book.pdf

Evaporate cooling systems



Clay pot cooler

Evaporative Cooling Chambers

https://energypedia.info/wiki/Evaporative_Cooling_Devices

Off-grid cooling solutions
"*Cooling as a service*"

New business model:
- Pay-as-you-store model
- CAPEX as store owner – user pays rent for storage only

- More info & tools:
https://www.caas-initiative.org/

Credentials: https://www.coldhubs.com/
Last mile cooling (market)

Credentials: https://www.inspirafarms.com/
First mile cooling (near farm)

WAGENINGEN
UNIVERSITY & RESEARCH

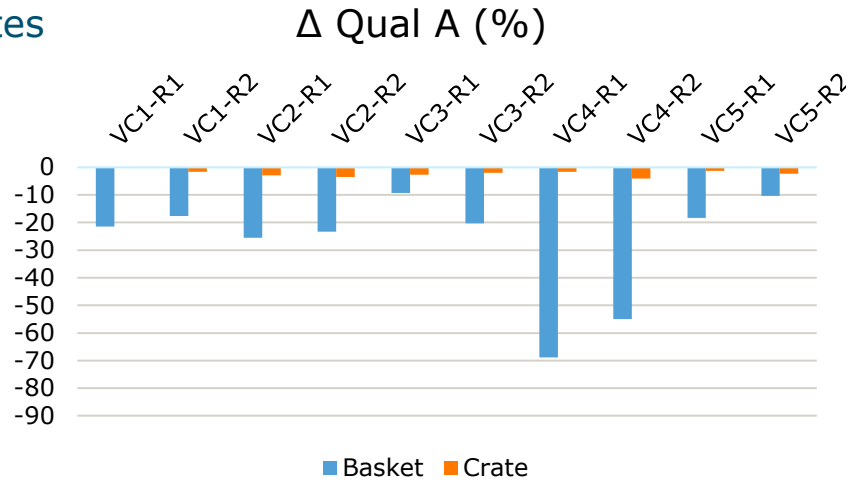
WAGENINGEN
UNIVERSITY & RESEARCH

Source: YouTube: https://www.youtube.com/watch?v=VnIV65l0K0c

Cases from practice

Nigerian tomatoes

Food loss prevention by changing to crates



Weight loss:	6% less
Grade A:	35% more
Monetary value:	6% increase

Not continued after pilot. Some reasons:

- Hardly demand for extra Grade A
- Distribution of additional earnings
- Ownership of crates

Postharvest Standard Operating Procedures

Basis for food loss reduction, new trading systems, financing and training

Background/ introduction

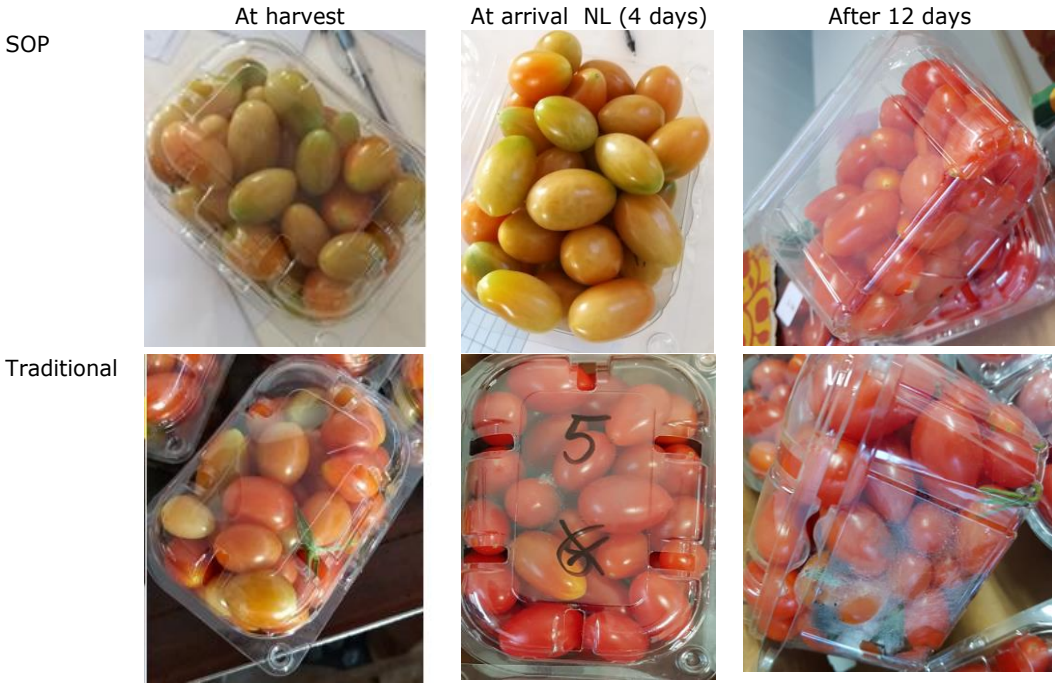
- Current low farm-gate prices, and lack of access to finance impede investments at farm level.
- Incomes can be improved by access to more distant and/or high-end markets.
- Tailor-made Postharvest Standardized Operational Procedures (or SOPs) are a pre-requisite to assure quality is maintained.
- Substantial food losses of fruits and vegetables occur during postharvest handling and transport. SOPs can reduce these, even in uncooled chains

Methods/Approach

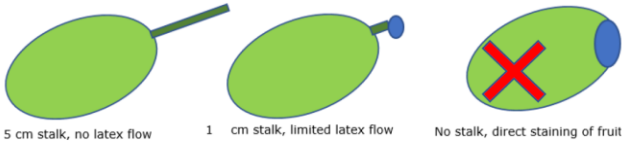
- SOPs for the fruit sector in Benin with the aim to train and enable expansion of the export sector

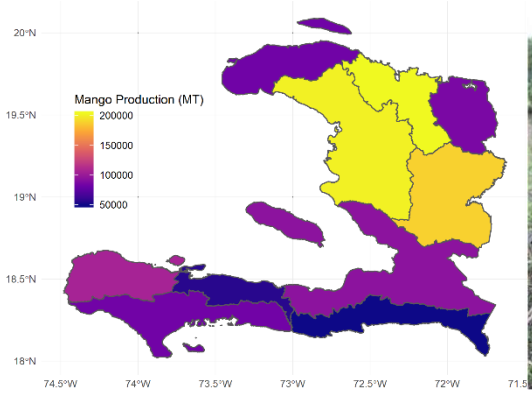
Examples

- SOPs for tunnel vegetables in Jordan with the aim to standardize consistency in quality and thus improve the export position in Gulf countries



Market access for Haitian mangoes





Blockchain enabled:
Fair price for farmer

WAGENINGEN
UNIVERSITY & RESEARCH

More info: https://www.wur.nl/en/project/Improved-mango-and-avocado-chain-helps-small-farmers-in-Haiti-1.htm

Concluding SOPs

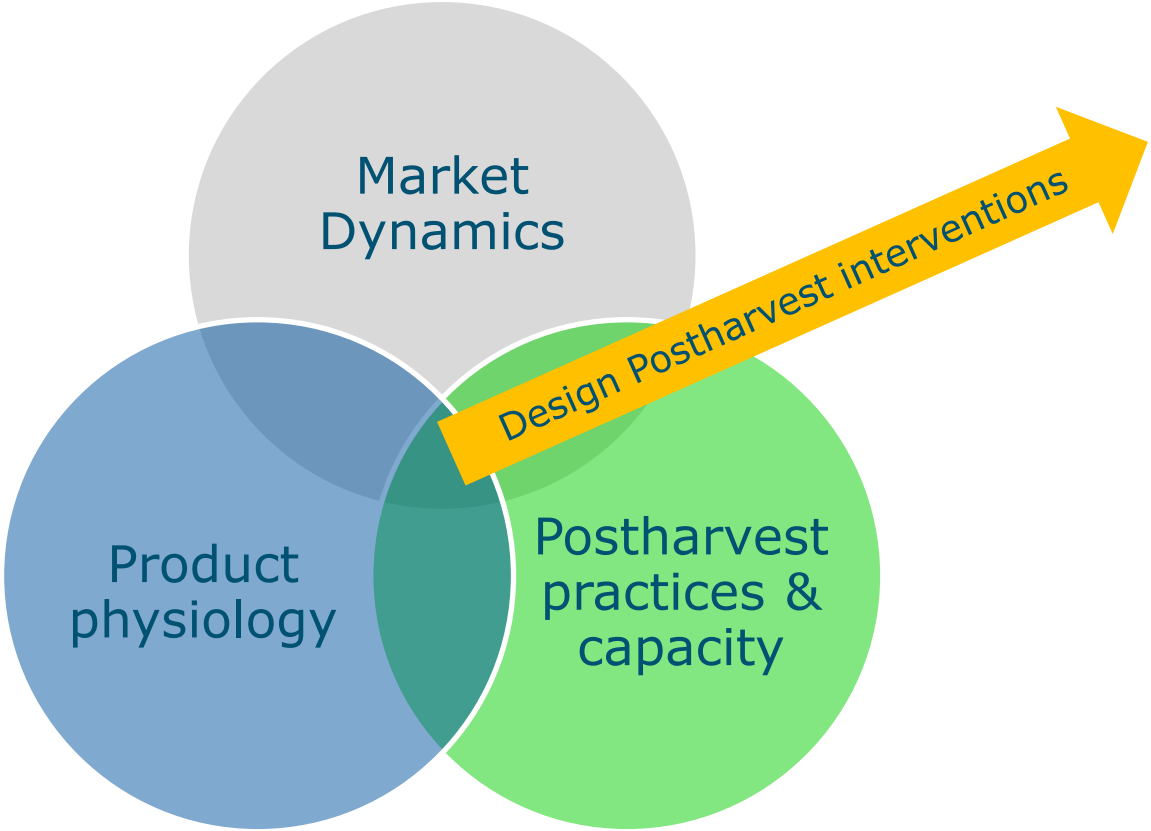
Postharvest Standard Operating Procedures (SOPs):

- Can be designed for any level of food system and facilitate extension, but **it needs to take the local situation into account!**
- Lead to consistency in quality and access to more distant/high-end markets
- Significantly contribute to loss reduction

Blockchain technology:

- Can increase farmer income but needs SOPs as a basis
- Banks can use blockchain for a reliable and scalable financing system

Designing postharvest innovations



Source: Verschoor, et al. (2020): Postharvest interventions, key for improvement of food systems https://www.wur.nl/en/article/White-paper-on-how-postharvest-interventions-contribute-to-improving-food-systems.htm

Thanks for your attention!

Jan Verschoor

jan.verschoor@wur.nl

+31 653922215

Bas Hetterscheid

Bas.hetterscheid@wur.nl

+31 3174 888 09

WAGENINGEN
UNIVERSITY & RESEARCH

80+ Years of Postharvest Research: #1 Worldwide

1936

Foundation IBVT
by prof. A.M. Sprenger

1966

Renamed Sprenger Institute

1990

Renamed ATO-DLO

2017

WFBR – Renewed facilities (PHENOMEA)

DCS™

QUEST™

Sea freight
Cut-flowers

Utilisation of postharvest data — Big data & AI

Application of postharvest sensors — Sensing technology

Development postharvest physiology — Ethylene and CA technology

Packaging technology — *Development postharvest handling*

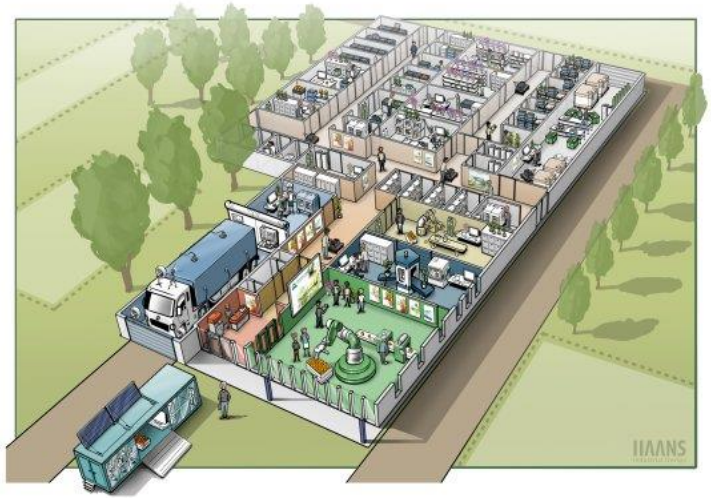
Cooling technology — *Development basic postharvest systems*

WAGENINGEN
UNIVERSITY & RESEARCH

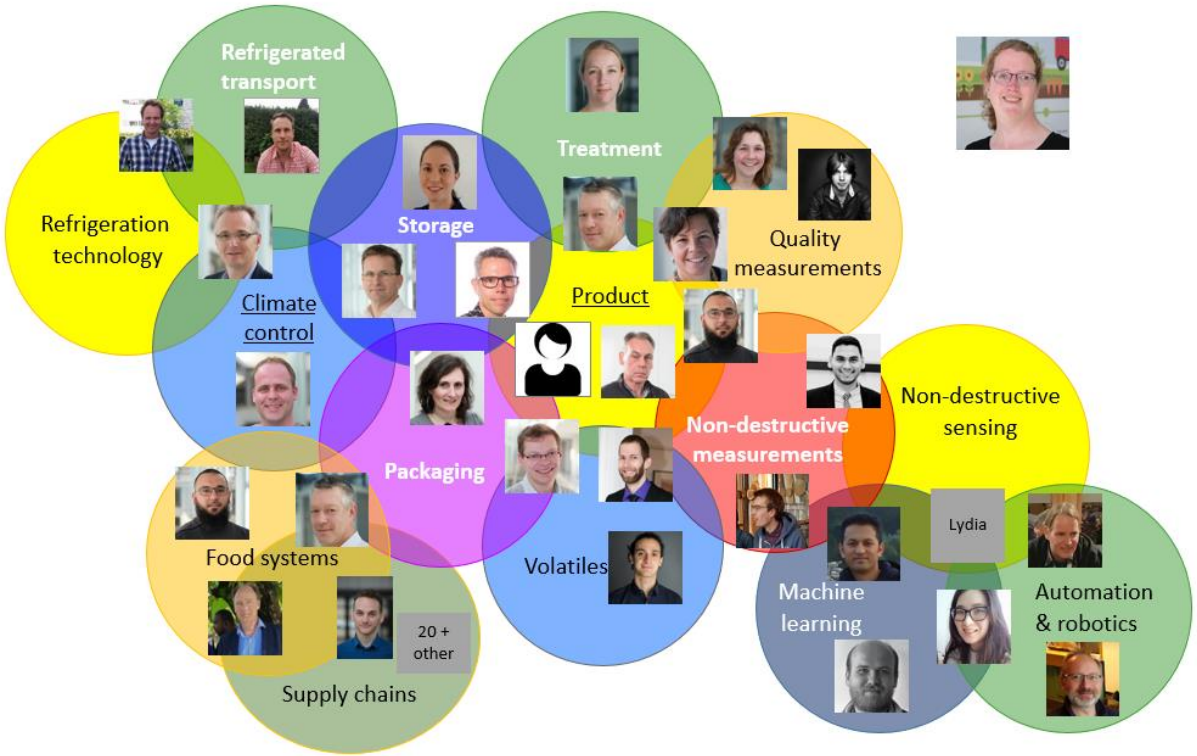
- Virtual Tour Phenomea

  the postharvest research facility

https://www.youtube.com/watch?v=e3B51uGDyrc



Acknowledgement to my great colleagues



About Jan Verschoor

>20 years experience in Postharvest physiology and technology R&D:

- Optimal storage conditions and disorders
- Development of Dynamic Controlled Atmosphere systems
- Postharvest technology evaluation/development
- Non-chemical Postharvest insect control (CATT)
- International Postharvest training and consultancy

Passionate about creating impact by implementation of postharvest knowledge

WAGENINGEN
UNIVERSITY & RESEARCH