# ACR in Practice

My Fruit

# Why Dynamic CA (ACR)?



➤ Prevent scald & other oxidation problems

➤ Maintain the premium harvest quality during the storage & shelf-life

➤ Extend market availability window

➤ Sustainability of the technical equipment & energy consumption

Dynamic CA

# Advanced Control of Respiration

The system measures respiration rate, calculates Respiratory Quotient (RQ) in full loaded CA stores and automatically adjusts $O_2$ level within a safe range based on the fruits physiological behavior.
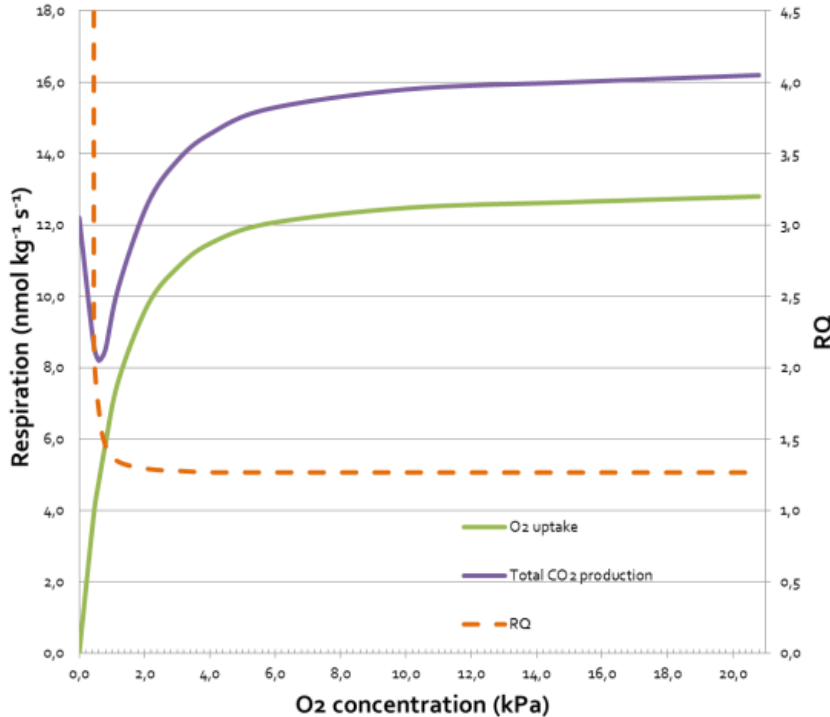
Goal:
Store fruits at the beneficial lowest $O_2$ level

Method:
My Fruit Dynamic software measures $O_2$ & $CO_2$ change during a time frame

Dynamic CA

My Fruit
The Best Fruit

ACR
DYNAMIC

# Background of RQ



How is RQ defined?

**Respiratory Quotient:**

$$RQ = \frac{[produced\ CO_2]}{[O_2\ taken\ up]}$$

Dynamic CA

My Fruit
The Best Fruit

# RQ: Early warning fermentation



RQ and ethanol production

- Lowest beneficial $O_2$ level
- Safe from fermentation
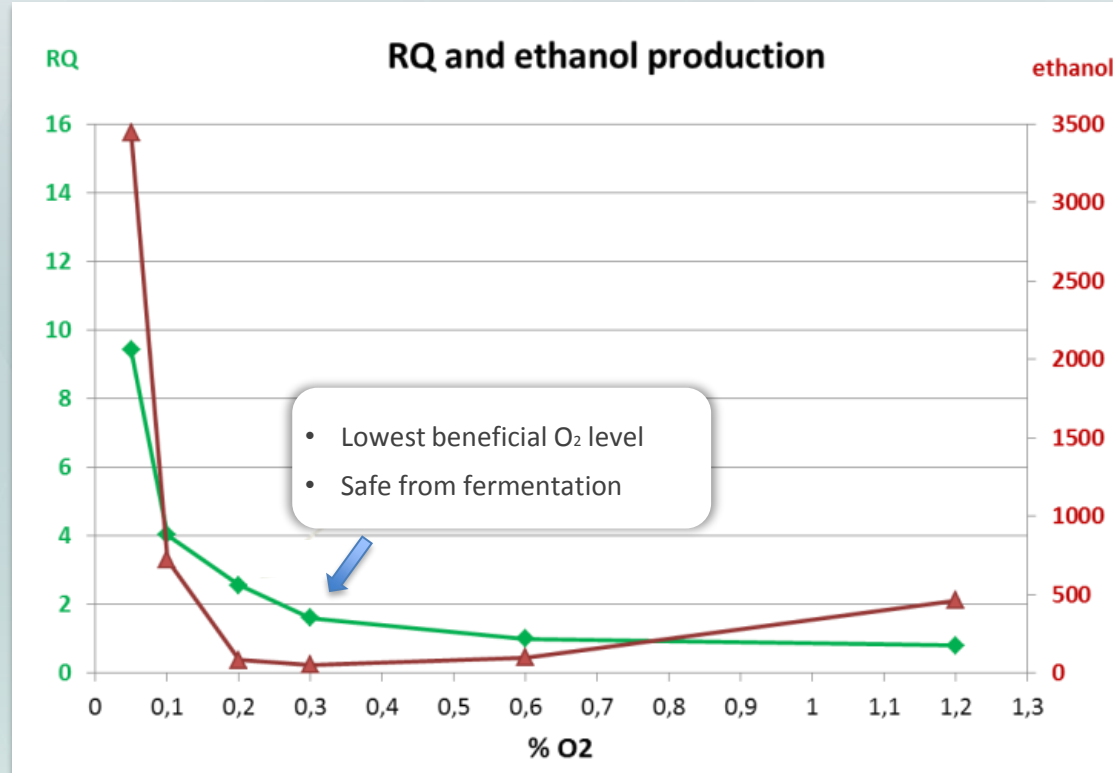
RQ

Ethanol Development

Dynamic CA

# Benefits on fruits & energy saving



Firmness in (kg cm-2) chart:
- At harvest
- 1-MCP & CA condition1
- 1-MCP & CA condition2
- ACR & 2.5% $CO_2$
- ACR & <1% $CO_2$

1-MCP   ACR

1-MCP   ACR

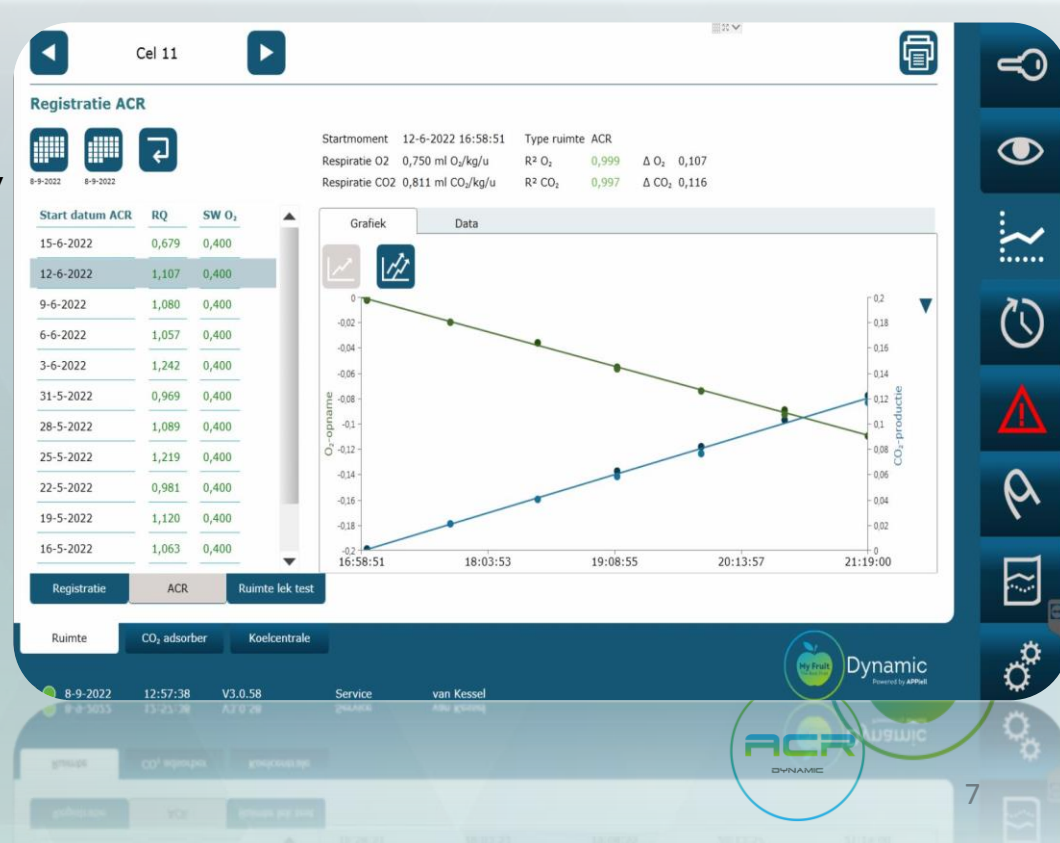Directly after opening the store

1 week after shelf-life at 18 °C
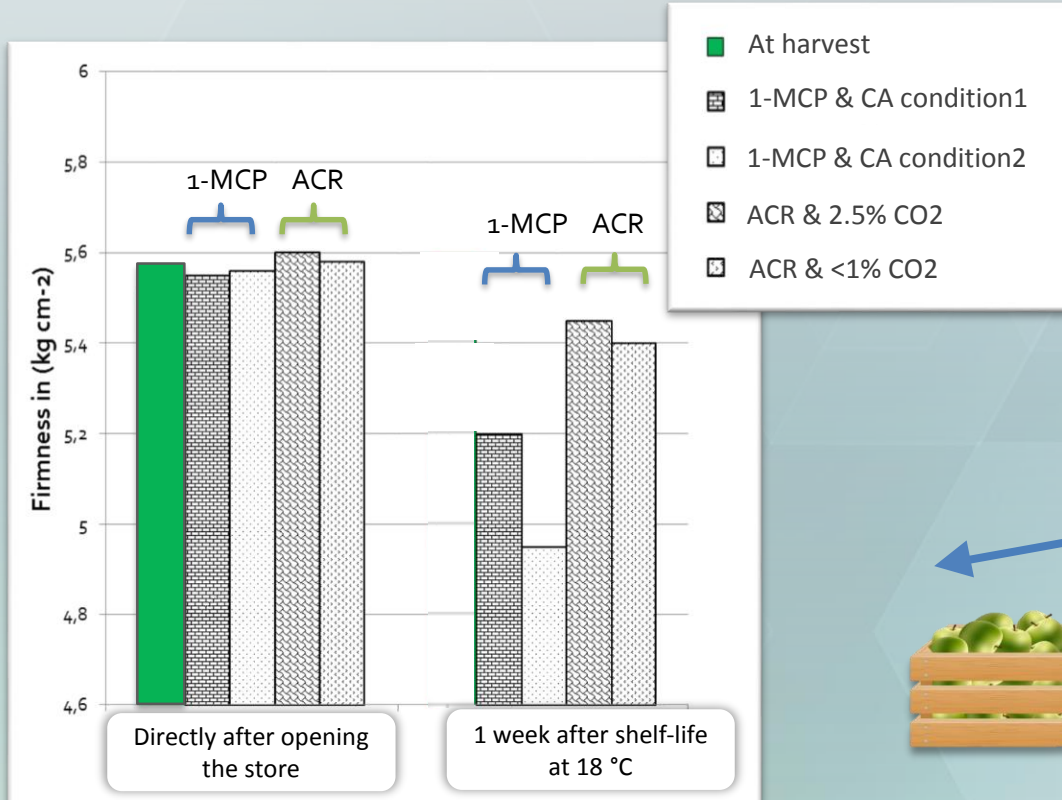
✓ Lower energy consumption
✓ Less moisture loss

ENERGY COSTS
- 20 to 30%

# Process of ACR in My Fruit

- Temporarily shut off cooling & CA activity
- Increase room pressure to ±10 mm WC
- Typical run 4 hrs
- 7 data points for $O_2$ and $CO_2$
- Two measuring points per room
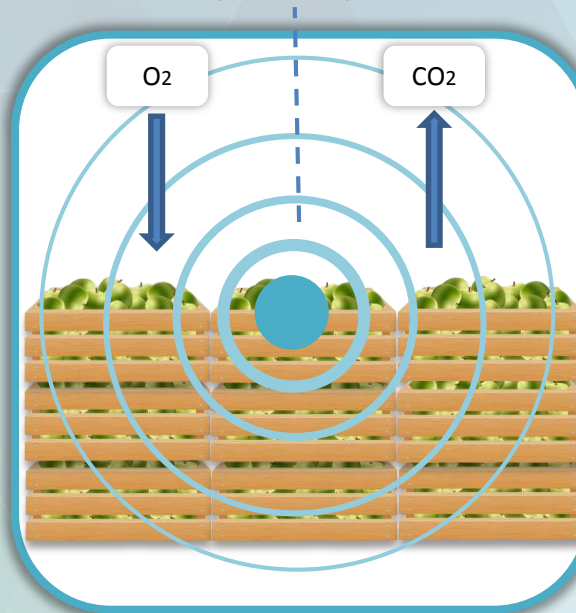- 2-3 runs weekly, per room
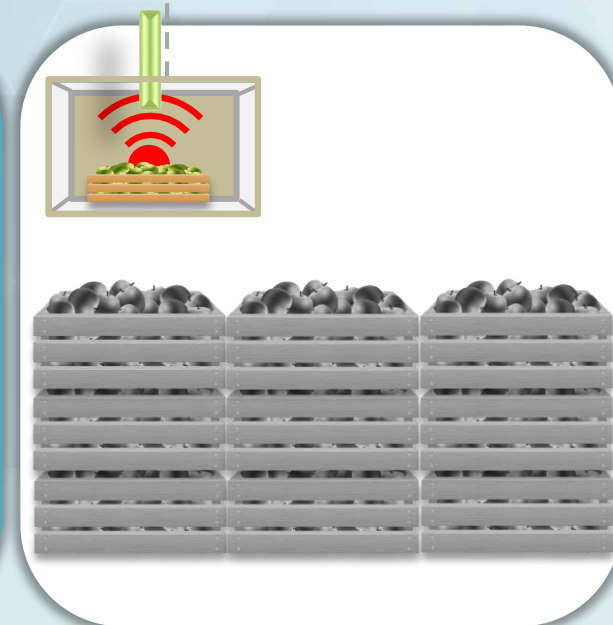
# DCA comparison

Measuring small samples

Measuring entire room
**VA patented System**

Measuring small compartment

$O_2$

$CO_2$
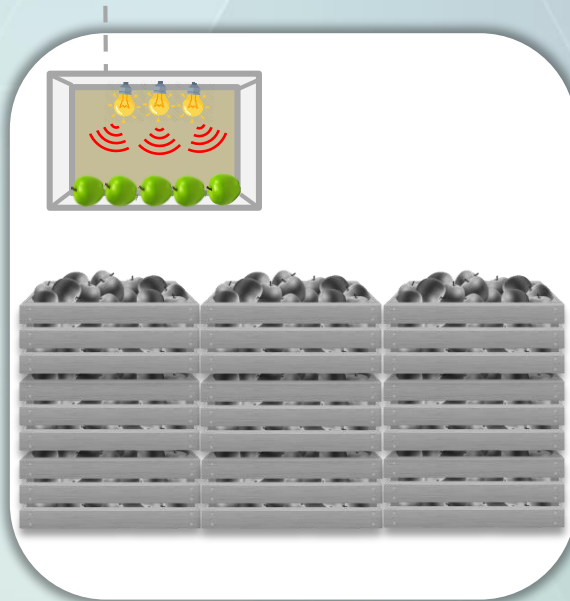
Competitive DCA system I
Based on Fluorescence

ACR
**Based on respiration / RQ**

Competitive DCA system II
Based on ethanol measurements
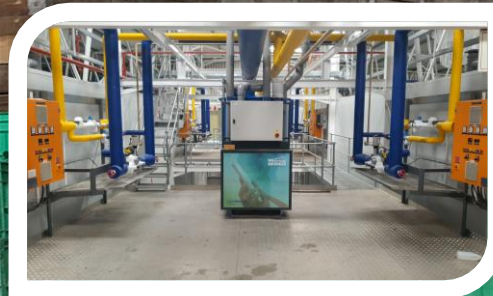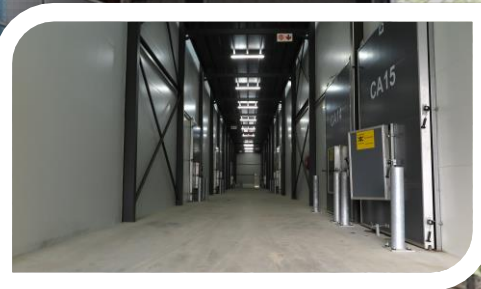
# Protocols

# Novo South Africa

23 ACR Rooms

Cooling control integrated

Storage capacity of 10.500 ton apples

# CA Research Facility WUR PPO

7 CA Testing Rooms & 8 CA lab containers

Cooling control integrated

Waterloss management

Built in 2022
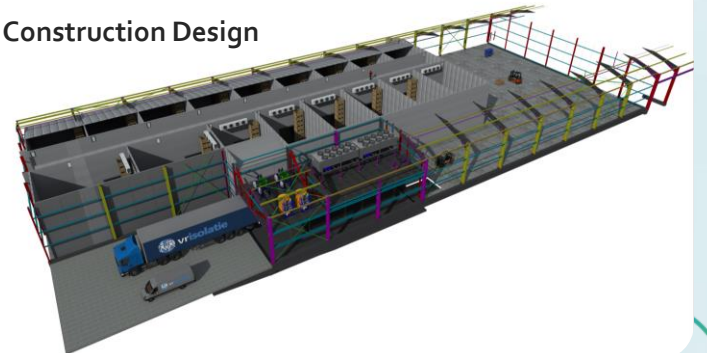


Dynamic CA

# Blijderveen Fruit Netherlands



36 CA Rooms (8 ACR Rooms)

17 new rooms later

Apples and Pears

**Construction Design**



Dynamic CA

THE DYNAMIC FRUIT MANAGER

My Fruit

Check our webinar
SCAN ME

FRUIT STORAGE

The next level of
CA storage

VAN CA technology
AMERONGEN

CA EQUIPMENT

RESEARCH CONTROL

CA CONDITIONS

FLEXIBLE CA STORAGE

COOLING CONTROL

DYNAMIC CA

WATERLOSS CONTROL

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