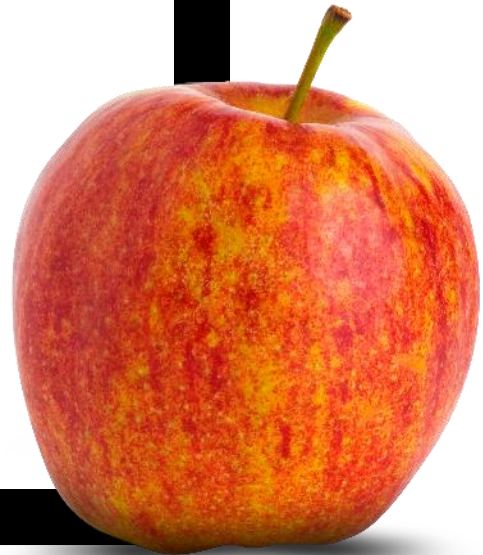


# Apple

Gala

2020



## AIM OF THE STUDY:

WHAT IS THE IMPACT OF THE HDCOLD® TECHNOLOGY ON THE STORAGE QUALITY OF THE GALA APPLE COMPARED TO A STANDARD COLD ROOM?

### Current practice<sup>1,2</sup> :

- Recommended ripeness at harvest:
  - Starch: 6-7 (CTIFL chart)
  - Flesh firmness: 7-8 kg/cm<sup>2</sup>
  - Background color: F2-F3 (CTIFL)
- Normal cold storage (3-4 months):  
0-1°C at 90-92% RH
- Controlled atmosphere (5-6 months):  
2-3% O<sub>2</sub> / 2-3% CO<sub>2</sub> (1.5% in ULO)
- Susceptible to stem cracks, or even bursting, during prolonged storage, as well as internal and external browning.

### HDCold® technology:

- Cold system which maintain natural relative humidity at high levels (>98 %)
  - No addition of liquid water
  - Decrease of water loss, and therefore weight loss of the products
- Low temperature difference between the set point and the refrigerant:
  - Less hydric stress on the products
  - Less to no frost formation

<sup>1</sup> Westeramp P., 2023. Conditions de stockage des différentes variétés de pommes. <https://www.ctifl.fr/conditions-de-stockage-des-differentes-varietes-de-pommes>

<sup>2</sup> Gabioud Rebeaud S., Bühlmann A., 2024. Recommandations d'entreposage pour les fruits en 2024. Agroscope Fiche Technique n°222

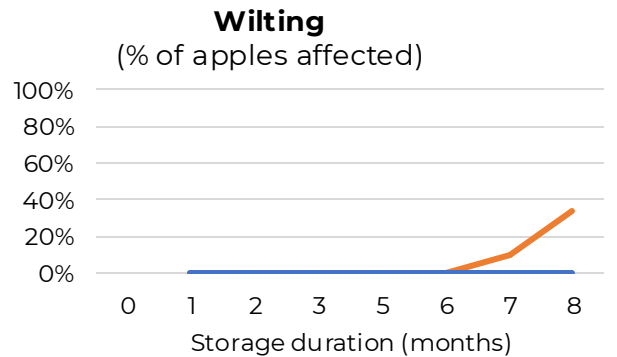
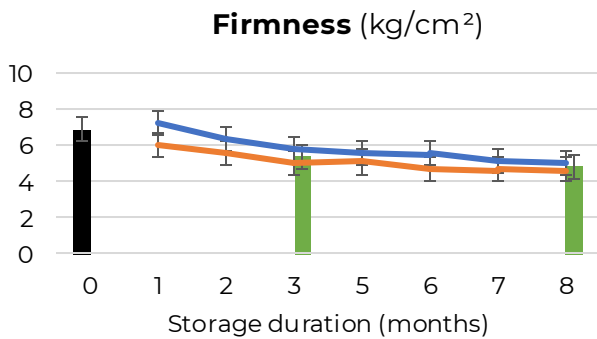
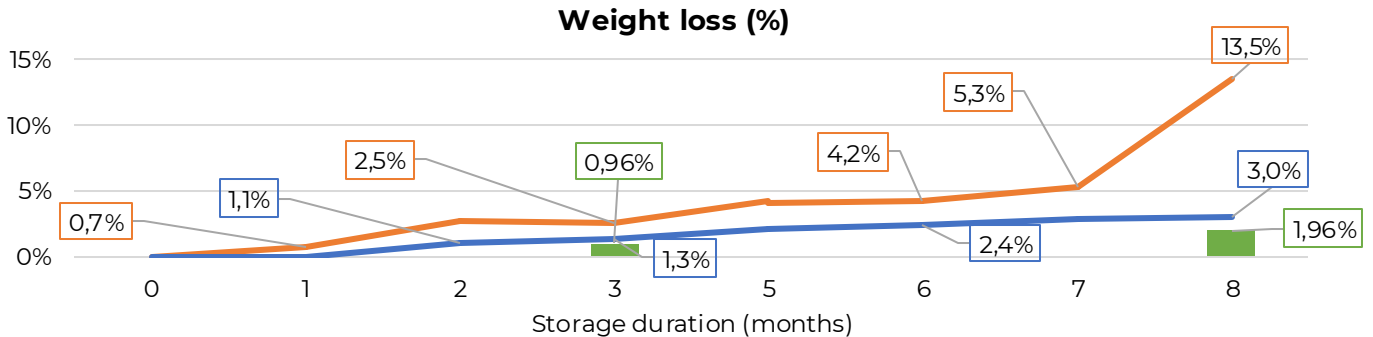


# RESULTS

**Harvest:** August 21, 2020 (Southwest France) **Starch:** 9.6 (overripe)

**Classical cold room** (1°C, non regulated RH) **HDCold® cold room** (1°C, 98% RH)

**HDCold® + ULO** (0.8% < O<sub>2</sub> < 1.2%; CO<sub>2</sub> < 1.2%)



After 6 months of storage	# out of 30 apples		°Brix (sugars)	Acidity (g/L malic)
	Physiological disorders	Fungal disorders		
<b>Classical</b>	2 (6.7%)	11 (36.7%)	12.40	1.80
<b>HDCold®</b>	1 (3.3%)	5 (16.7%)	12.33	1.93
<b>HDCold® + ULO</b>	3 (10%)	5 (16.7%)	12.63	2.10

## CONCLUSIONS

Despite the over-ripeness of the fruit, HDCold® technology made it possible to:

- ✓ **Reduce weight loss during storage**
  - ✓ 4.2% in Classical vs. 2.4% in HDCold®
- ✓ **Delay the onset of senescence**
  - ✓ From 3 months in Classic vs. 5-6 months in HDCold®
- ✓ **Delay the onset of wilting**
- ✓ **Maintain better firmness** (> 5 kg/cm<sup>2</sup> up to 5-6 months)

## RECOMMENDATIONS

**+ 0.5 à 1°C**  
**98 % RH**  
**5-6 months**



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