AARHUS
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FRUTIC 2017
Quality and Safety of Fresh Horticulture Commodities

Effect of raw material quality and MAP on color and texture retention of wild rocket (Diplotaxis tenuifolia L.)

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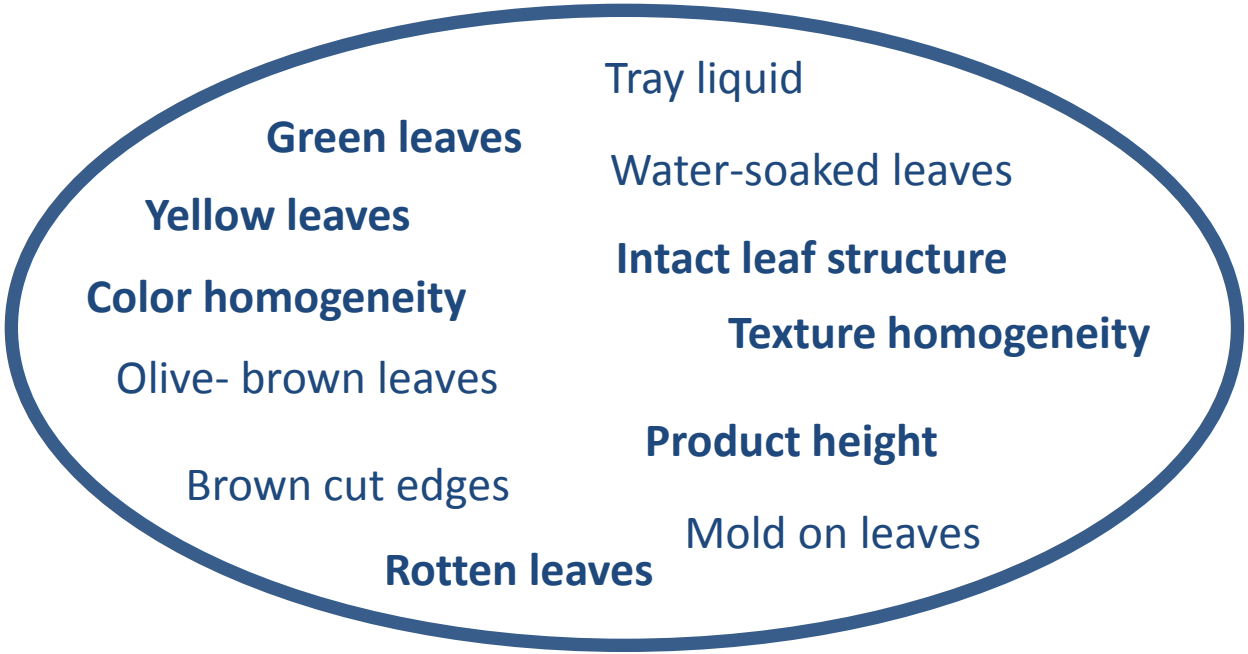
Visual quality of wild rocket

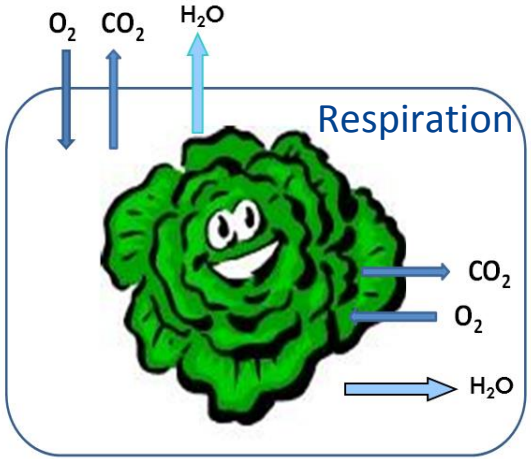


Løkke et al. 2012

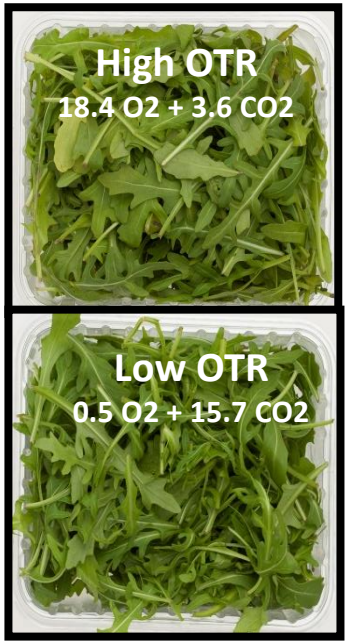
Important factors for maintaining quality

- Film properties

Transmission rate (TR)



Gas composition | Freshness



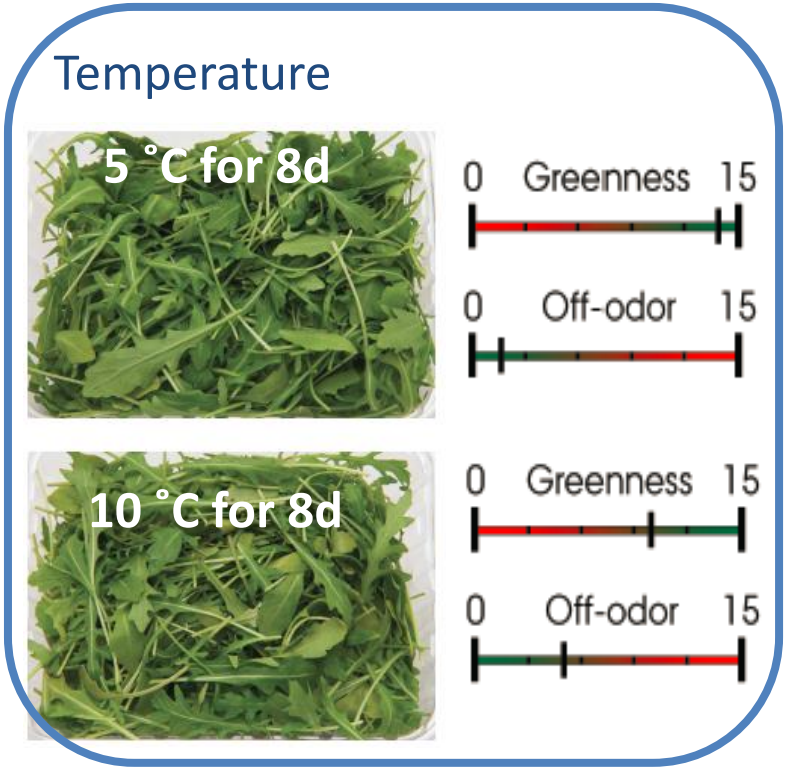
Visual: 9.5
Overall: 7.9

Visual: 11.5
Overall: 7.7

Løkke et al. 2012

Important factors for maintaining quality

- Film properties
- Storage temperature and time



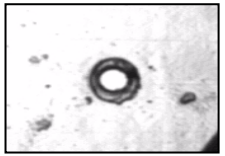
Løkke et al. 2013

Raw material study

Aim:
To determine the effect of **raw material and MAP** on **color** and **texture** retention at **retail (20 ˚C)** and **household (5 ˚C)** temperatures

Material

Wild rocket was harvested in **spring** and **late summer** and packaged in laser perforated film



Laser hole: 75µm

L-OTR: 2.6*

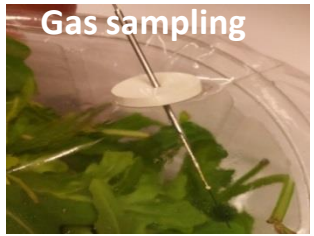
H-OTR: 17.4*

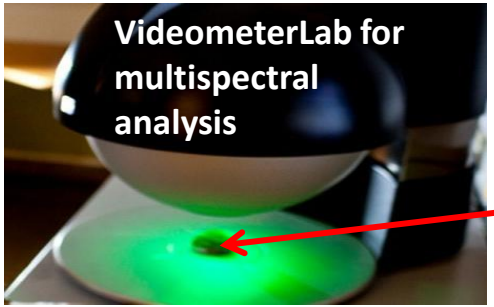
* pmol $O_2/m^2/kPa$ at 23 ˚C and 50% RH

Harvesting → Vacuum cooling → Cold storage at 2 – 3 ˚C → Packaging → Cold storage at 2 – 3 ˚C → Transport and distribution at 5 - 8 ˚C → Retail storage at 18 - 22 ˚C → Household storage at 5 - 10 ˚C

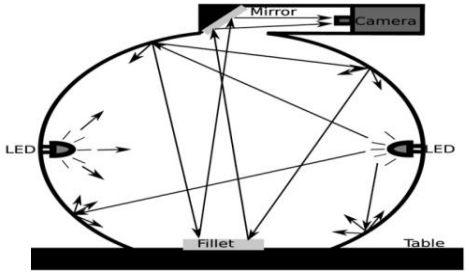
Methods

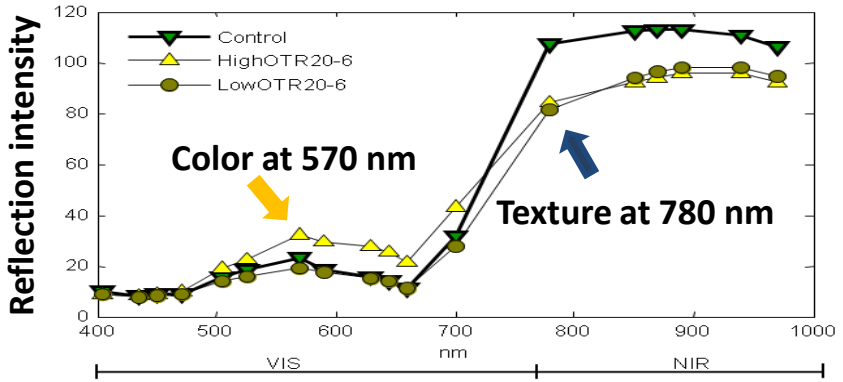
- Initial characterization of quality
- Gas composition during storage
- Weight loss during storage
- Multispectral analysis of changes in reflection intensity at 570nm and 780 nm



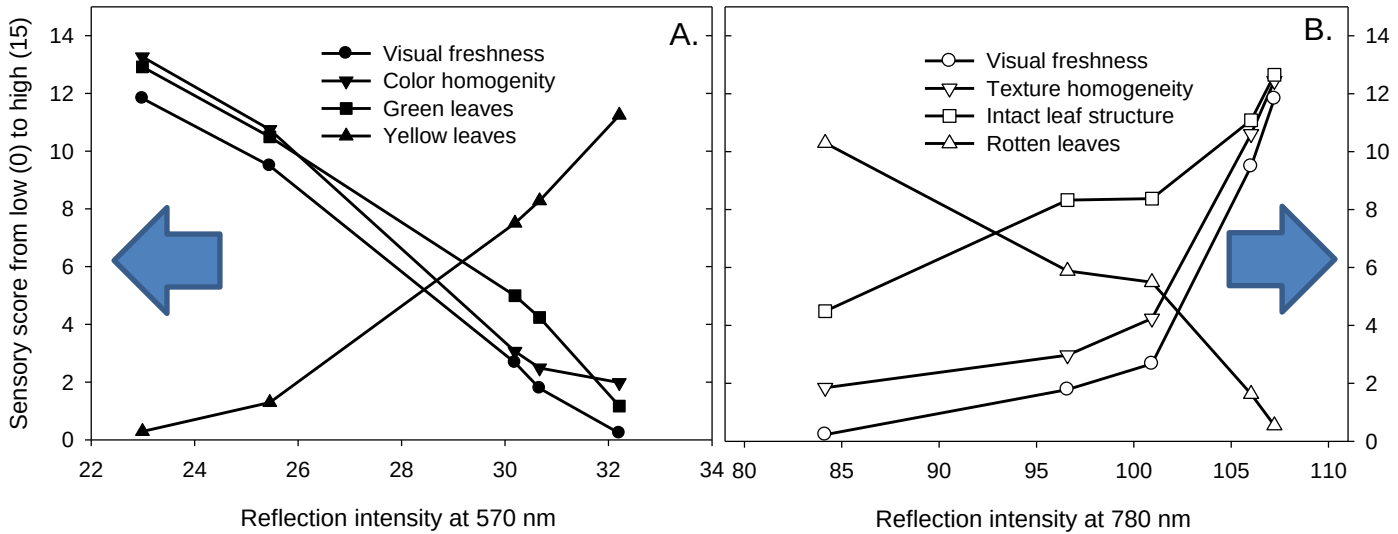


Petri dish with leaves





Reflection at 570 nm and 780 nm and relation to color and texture quality

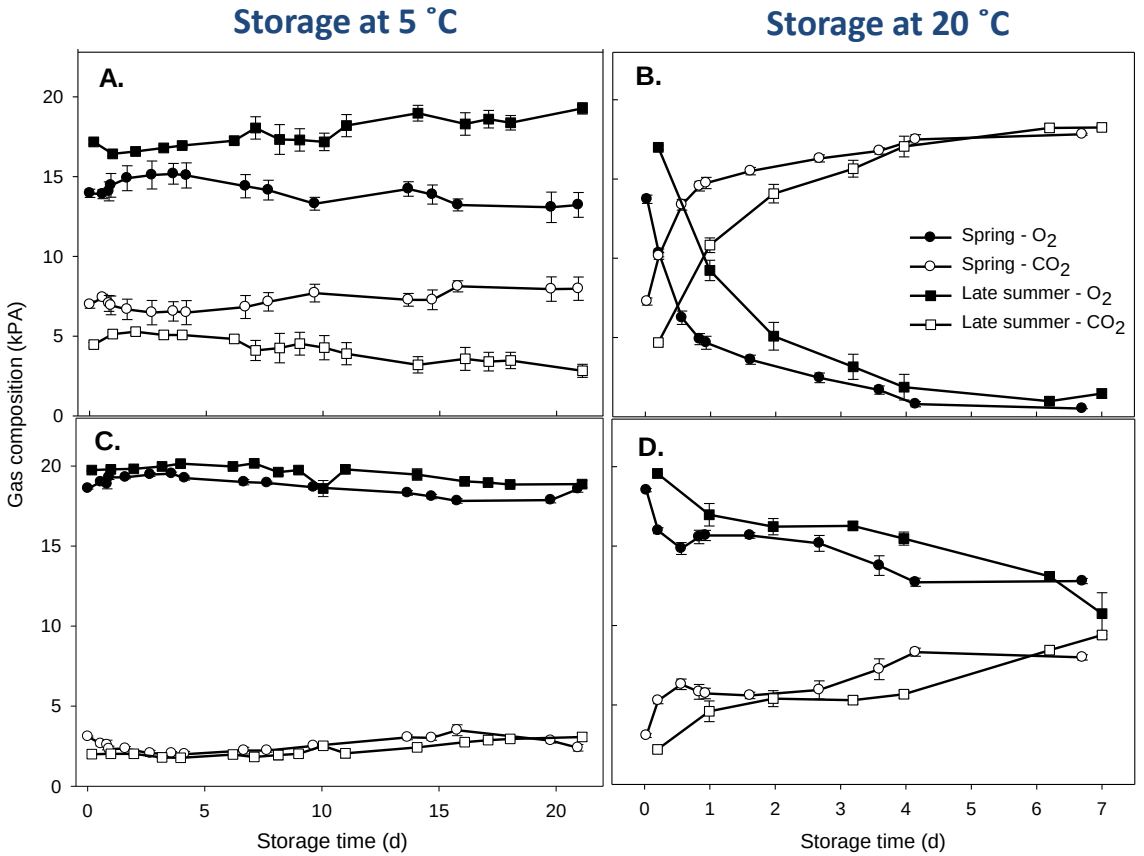


Løkke et al. 2012, 2013

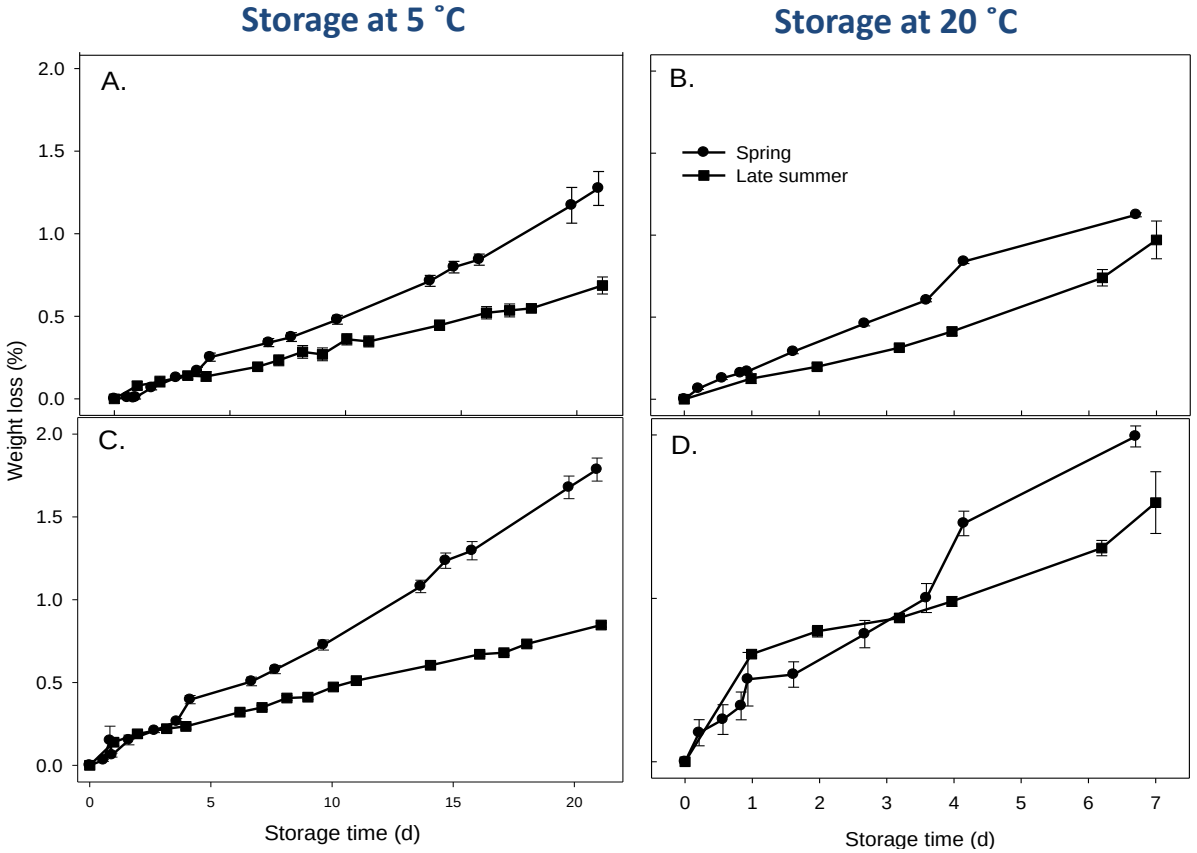
Quality at harvest

Harvest	Production week		Dry matter	Respiration rate at 5˚C	Quality of leaves at harvest
	Sowing	Harvest	(g 100 g^{-1})	(ml kg^{-1} h^{-1})	
Spring	36 year before	20	9.4[a]	55.2[a]	Small, dark green leaves with brown spots
Late summer	28	32	7.5[b]	25.2[b]	Small, delicate, wet, dark green leaves

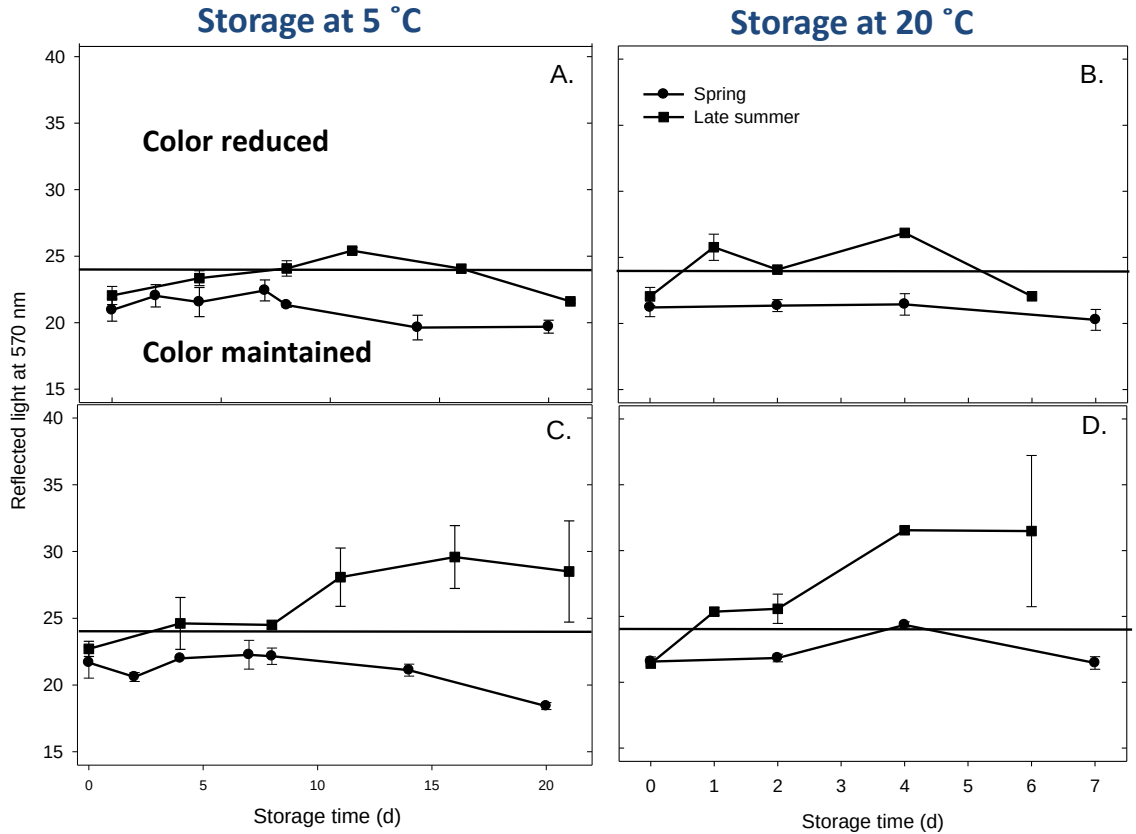
Gas composition



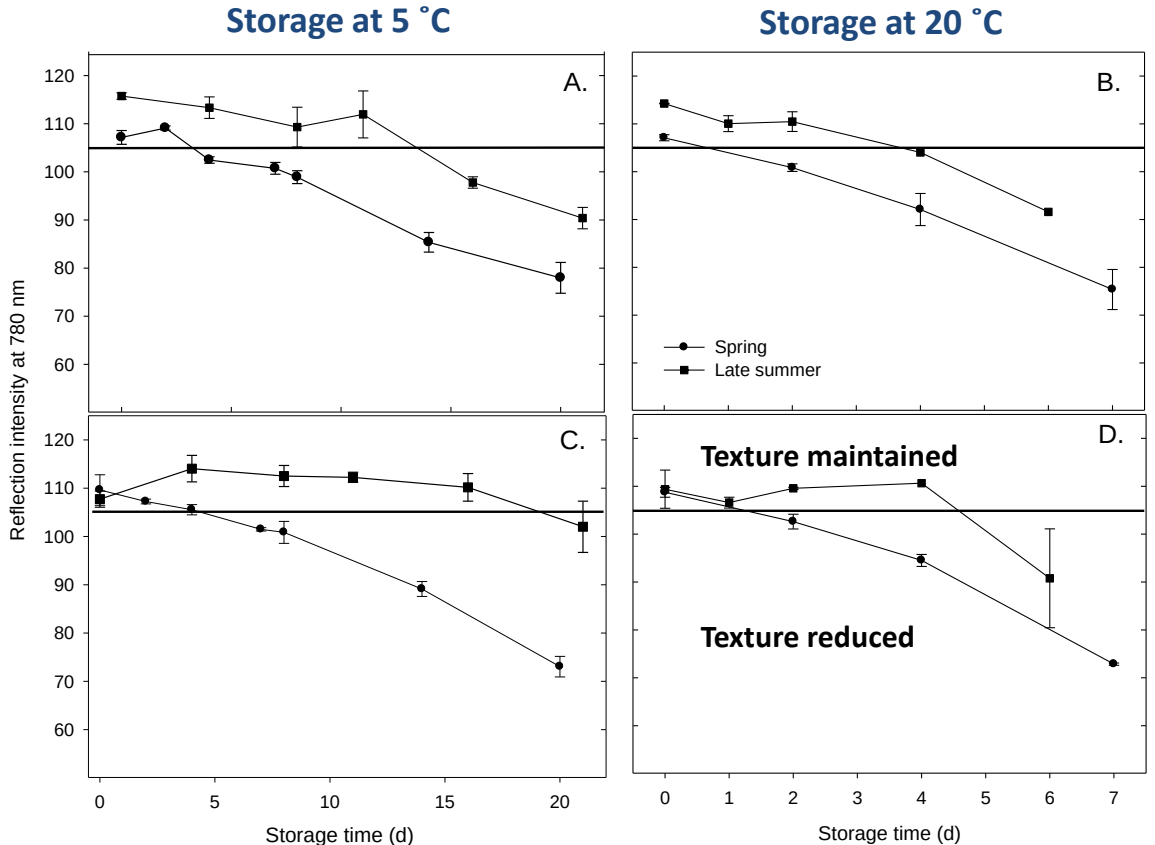
Weight loss


Storage at 5 ˚C
Storage at 20 ˚C
2.6 OTR
17.4 OTR
A.
B.
C.
D.
Spring
Late summer
Weight loss (%)
Storage time (d)
Storage time (d)

Color retention by mulitispectral imaging



Texture retention by mulitispectral imaging



Conclusion

The shelf-life limiting factors depend on the raw material properties at packaging.

- In the spring, **texture** was the limiting factor. In the late summer, **color** was the limiting factor.
- **Film OTR can prolong** the shelf-life but the effect depends on the **raw material properties** and the **storage duration.**

Thank you for your attention!