

Pre- and postharvest factors influence CA-related disorders on the new pear cultivar 'CH201'

Gabioud Rebeaud S., Cotter P.-Y. and Christen D.
 Agroscope, CH-1964 Conthey; www.agroscope.ch

Introduction

The new bicolor pear cultivar 'CH201' is issued from the breeding program of Agroscope and since recently marketed in Switzerland and in expansion in several European countries. This cultivar is characterized by a rapid entry into production, a high yield, a low susceptibility to fire blight and a long term storage potential, mainly due to the excellent maintain of its firmness. Under CA conditions, 'CH201' has shown nevertheless a susceptibility to CA-related disorders, in particular cavities.

Objective of the study

To evaluate the influence of pre- and postharvest factors on the development of CA-related disorders on 'CH201' pears in order to define a strategy of production and storage that ensures high fruit quality for the consumers.

Material and methods

Fruit were stored under NA and CA conditions at 0.5 °C and 92 % relative humidity for up to 8 months. The influence of various factors described in Table 1 was evaluated on the development of physiological disorders and fruit firmness.

O ₂ level	2, 5 and 21 %
CO ₂ level	1 and 2 %
1-MCP treatment	0.3 µL L ⁻¹
CA-delay	2 and 4 weeks
Maturity at harvest	Early and late harvest
Origin of the pears	Various orchards
Harvest year	The same orchard was evaluated during 5 years

Table 1. Factors evaluated in this study.

Results

Decreasing O₂ and increasing CO₂ levels in the storage atmosphere fostered the percentage of pears affected with cavities and was detrimental for firmness compared to NA conditions (figure 1). **1-MCP treatment**, performed in the week following the harvest increased cavities' incidence and showed no influence on firmness at removal from CA storage. 1-MCP effect was nevertheless observed on firmness after 7 days of shelf life at 20 °C (data not shown). **Delaying the CA conditions** of 4 weeks was highly beneficial to limit cavities on 'CH201' pears than a CA-delay of only 2 weeks and did not influence firmness after 5 months of storage and 7 days of shelf life. **Late harvested** fruit were more affected compared to early harvested fruit, and the disorders can **vary according to the year** (table 2), which suggests that a combination of various factors is probably at the origin of the disorders.

Preharvest factors		Pears affected with cavities
Maturity at harvest	M1	21%
	M2	35%
Harvest year	2014	0%
	2015	2%
	2016	0%
	2017	36%
	2018	26%

Table 2. Influence of maturity at harvest (M1: early and M2: late harvest) and harvest year on cavities.

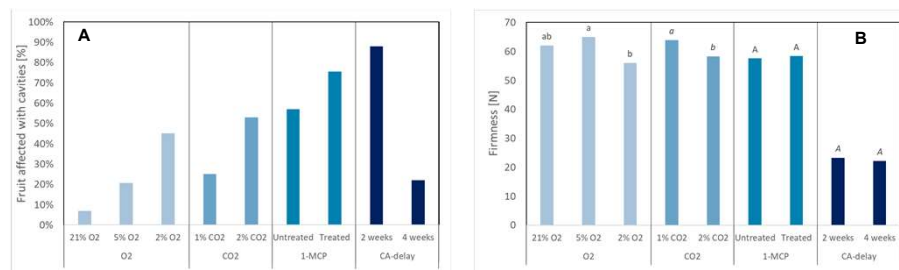


Figure 1. Influence of postharvest factors on **A**: cavities and **B**: firmness of 'CH201' after 5 months of storage. 'CA-delay': firmness measured after 5 months of storage and 7 days of shelf life. Means with the same letters are not significantly different at $p \leq 0.05$ in Tukey's multiple range test.



Conclusions

- High CO₂ level and 1-MCP treatment increased the susceptibility of 'CH201' pears to the development of cavities.
- Increasing O₂ level in storage atmosphere limited percentage of pears affected by cavities.
- A 4 weeks CA-delay reduced the incidence of the disorders in comparison to 2 weeks delay.
- Late harvested fruit were more susceptible to develop cavities compared to early harvest.
- A combination of various pre-harvest factors related to the orchard and weather conditions may be determinant in the apparition of the cavities.