Storing Evercrisp under CA and DCA

R. Beaudry, Ö. Horzum, N. Sugimoto

Storing Evercrisp under CA and DCA

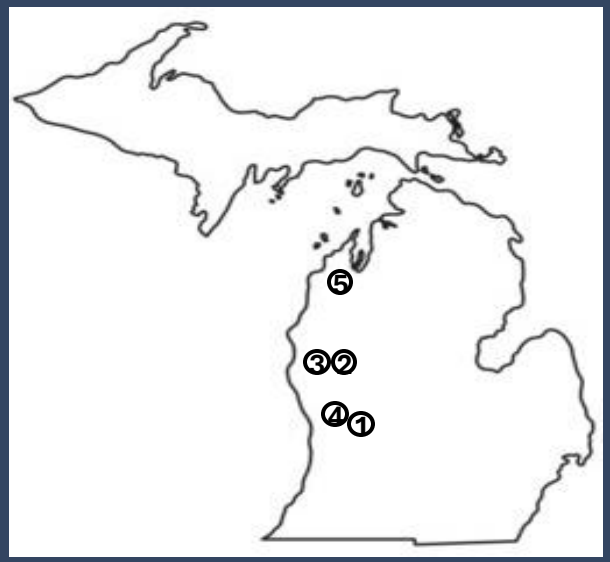
CA/DCA study

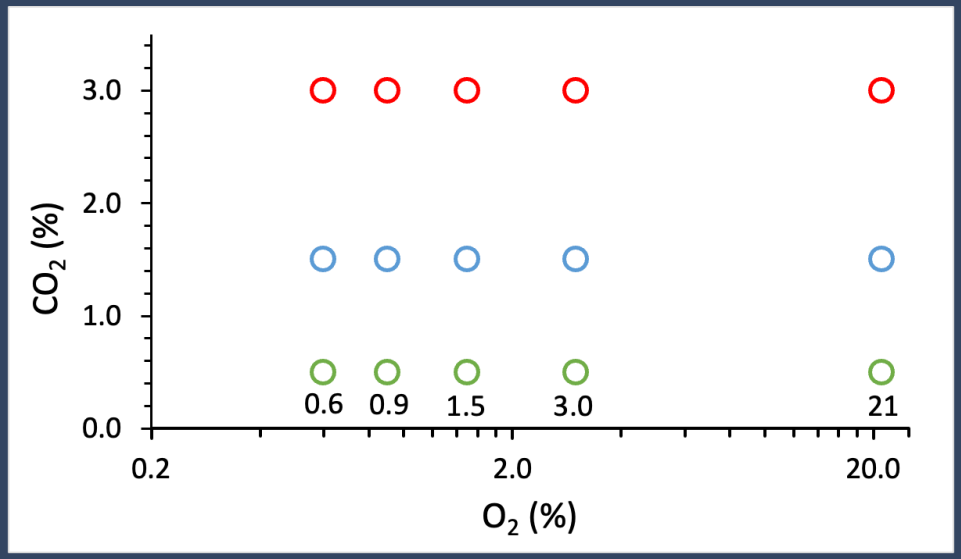
We set up a system to determine tolerances of Evercrisp apple fruit to low O_2 and to CO_2 in combination with low O_2.

Using the responses to oxygen, we determined the lowest O_2 level tolerated and we targeted two O_2 concentrations 0.2 and 0.5 % higher to represent DCA (0.6 and 0.9 % O_2)

We compared these O^2 concentrations to standard CA (1.5 and 3% O_2) and air (21% O_2)

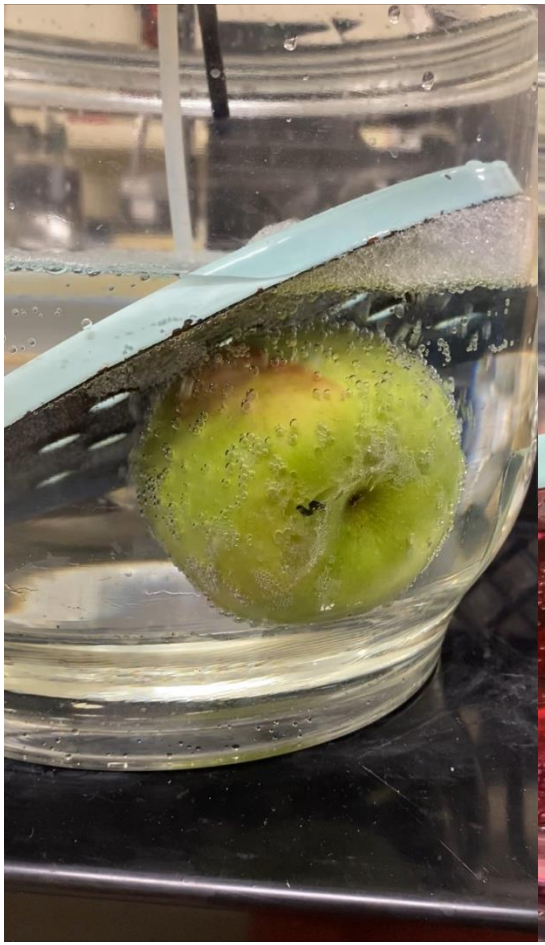
For every oxygen level, fruit were exposed to 0.5, 1.5 and 3% CO_2

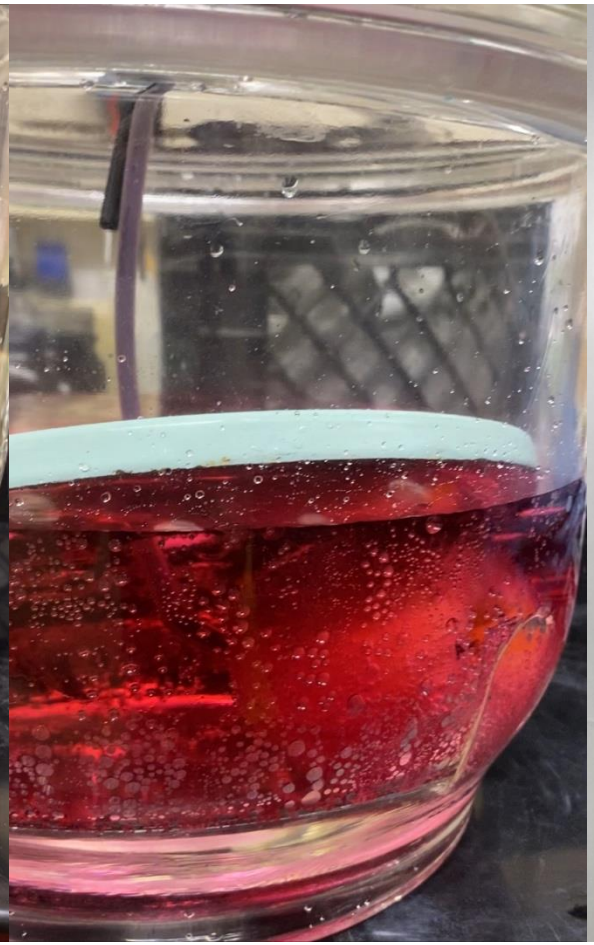




Sidenote: Evercrisp density

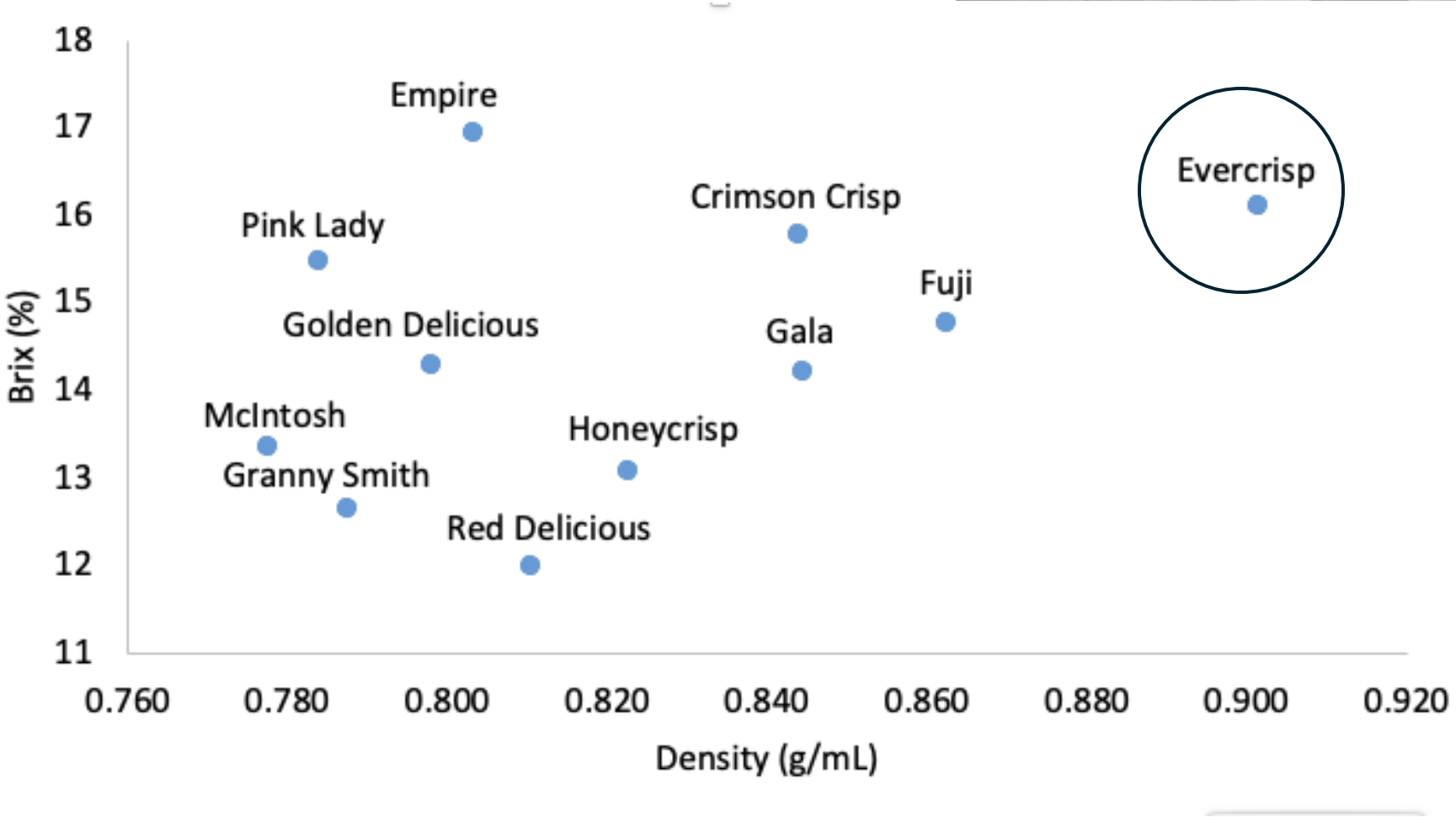
Sidenote: Evercrisp density





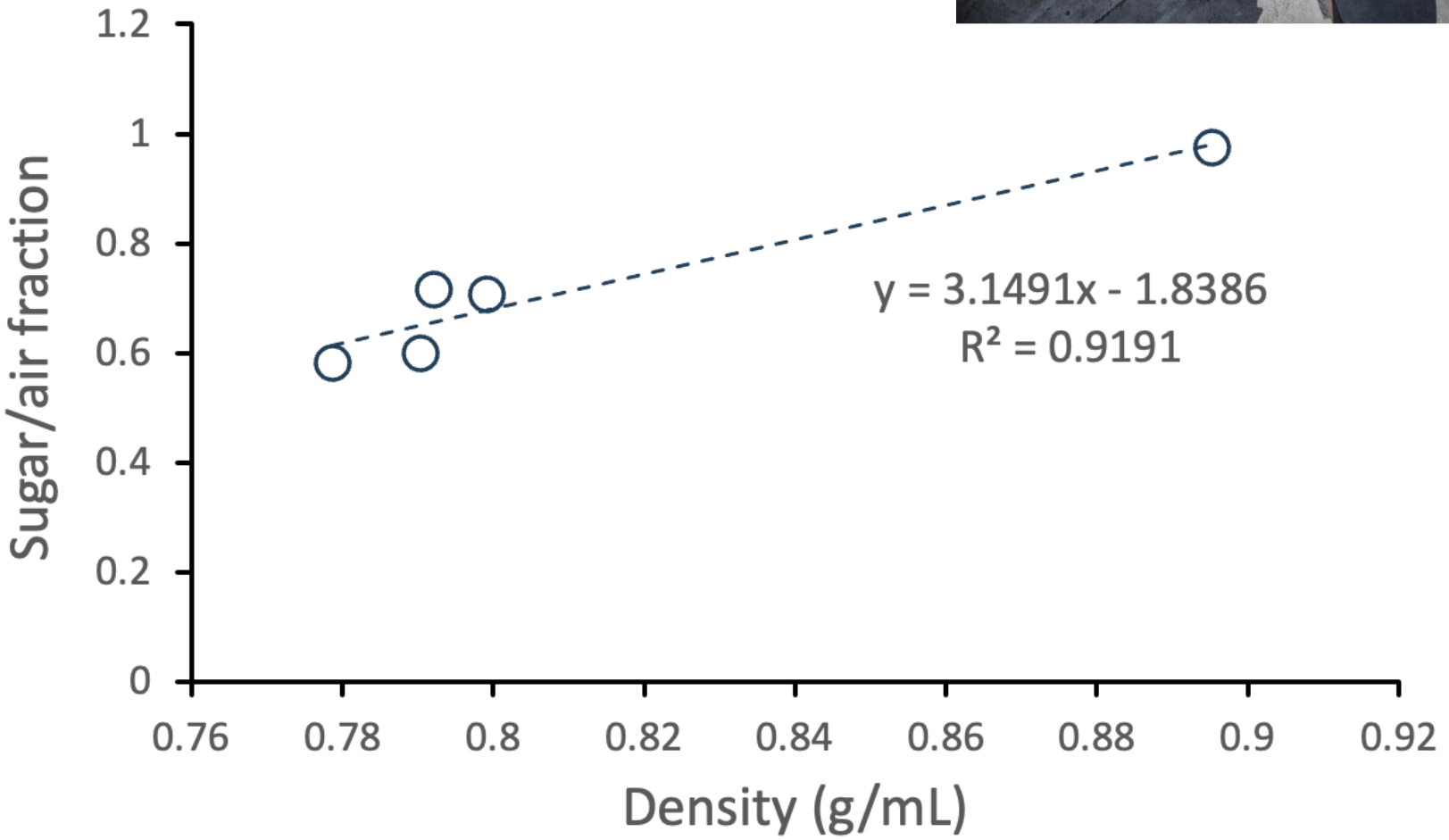
Sidenote: Evercrisp density

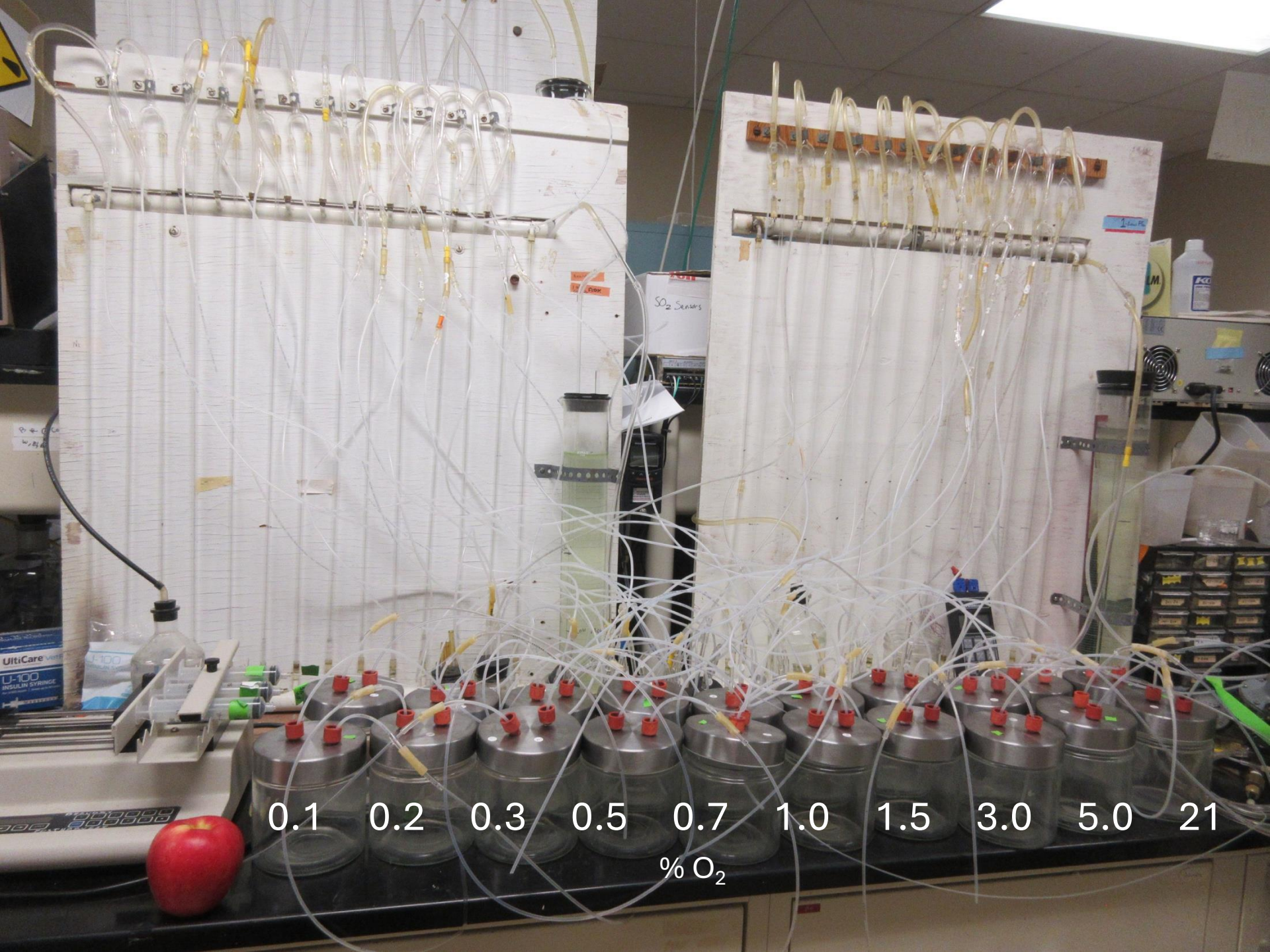
Put 7 to 10% fewer boxes on a truck!

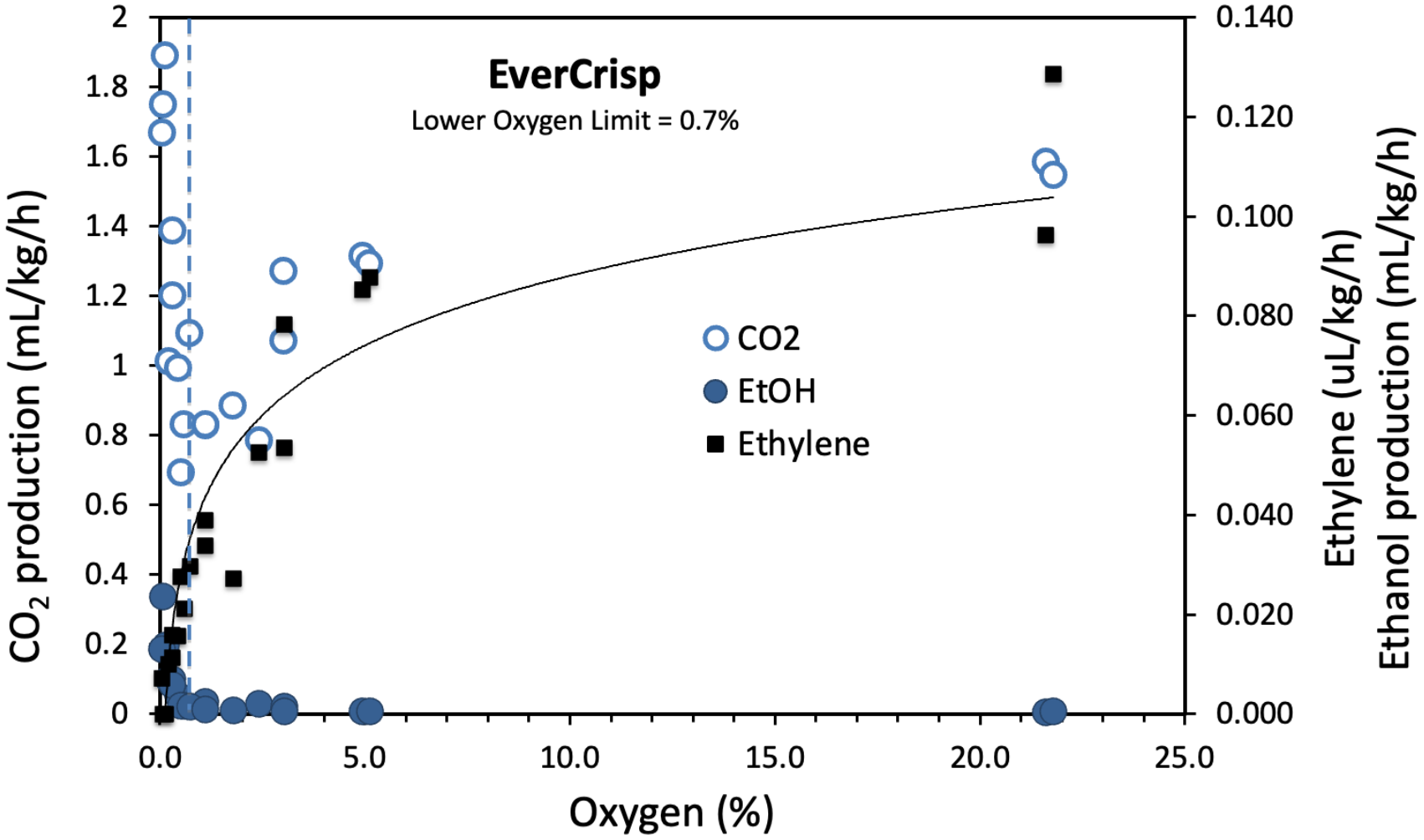


Sidenote: Evercrisp density

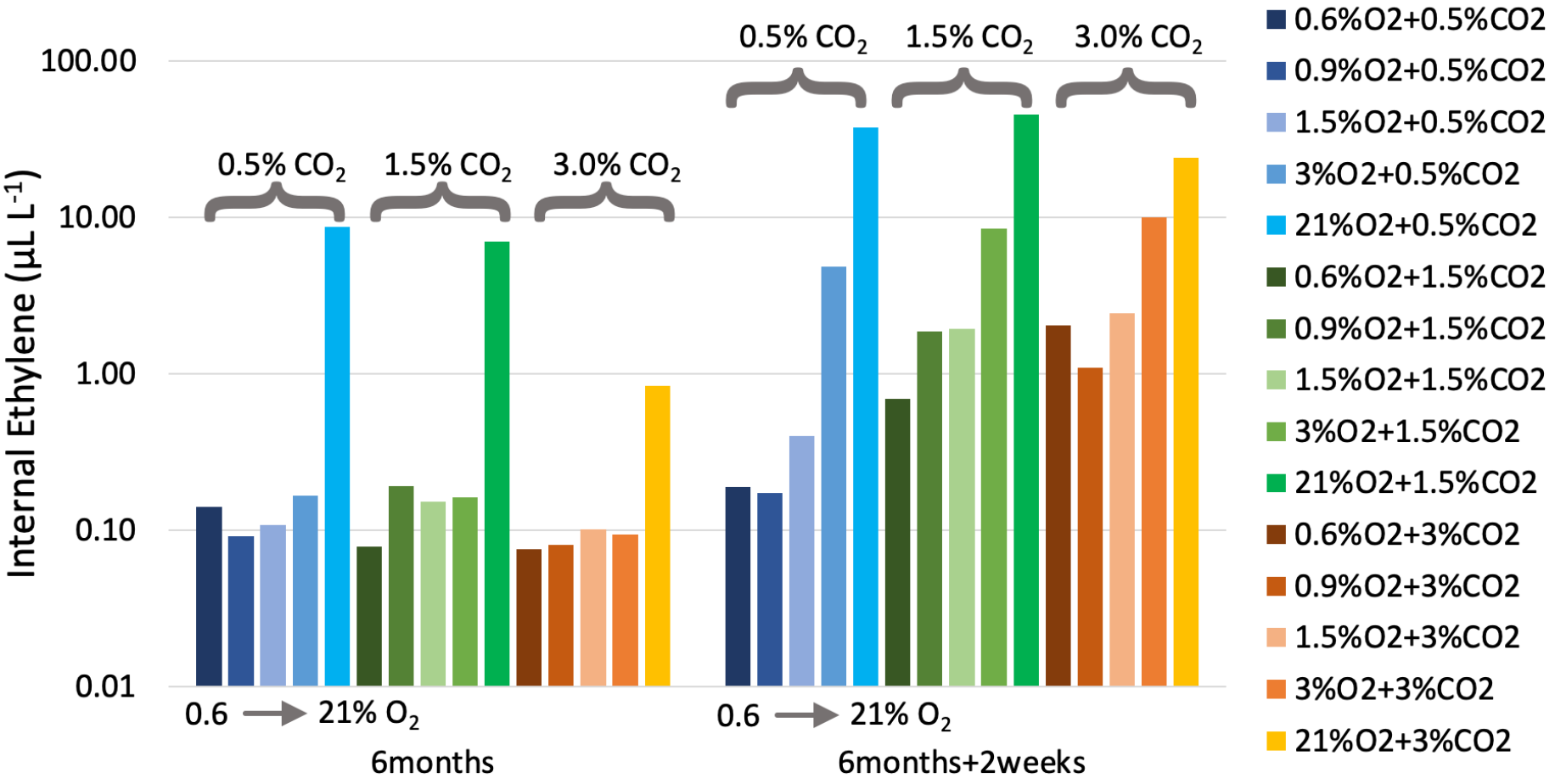
Put 7 to 10% fewer boxes on a truck!



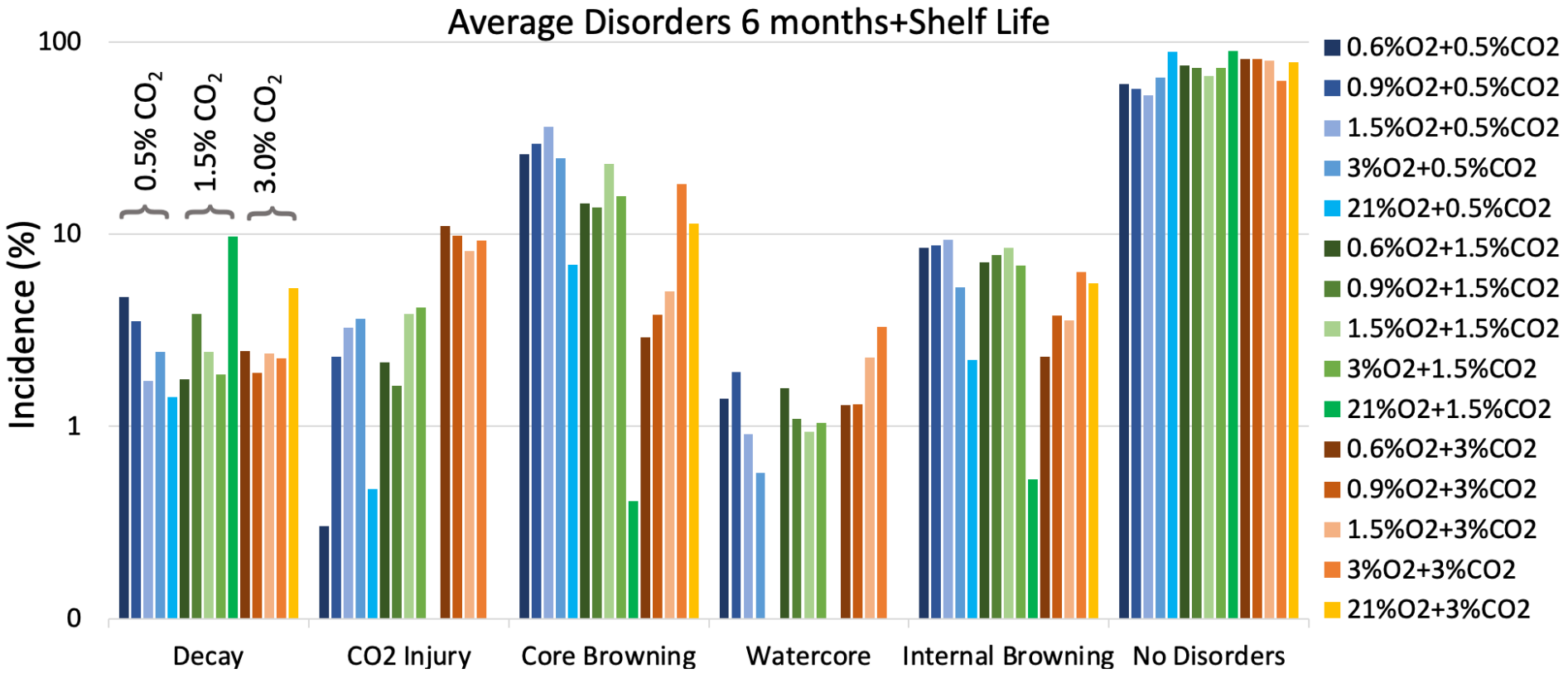

0.1 0.2 0.3 0.5 0.7 1.0 1.5 3.0 5.0 21
% O_2



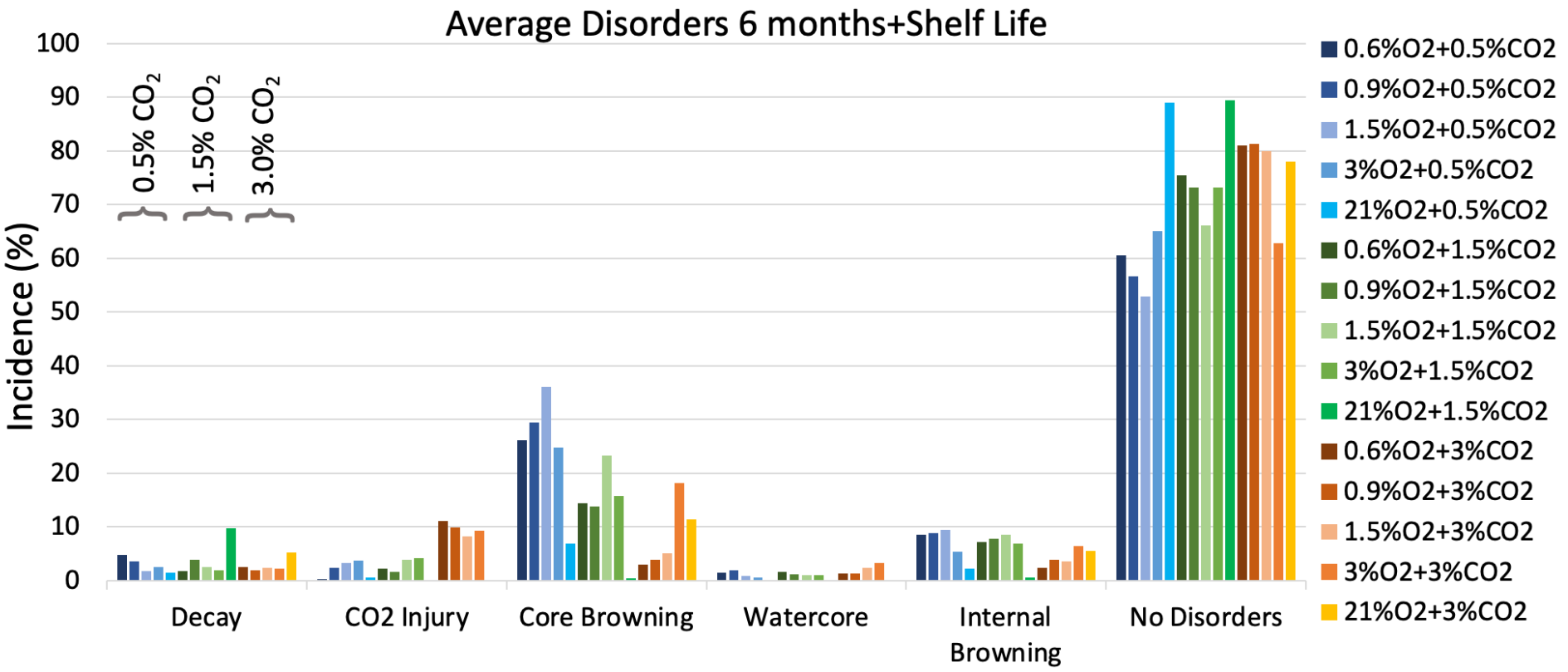
- Lower oxygen limits for the 5 orchards tested were: 0.5, 0.7, 0.7, 0.7, and 0.7% O_2
- Low O_2 markedly inhibits ethylene production (and ethylene action)



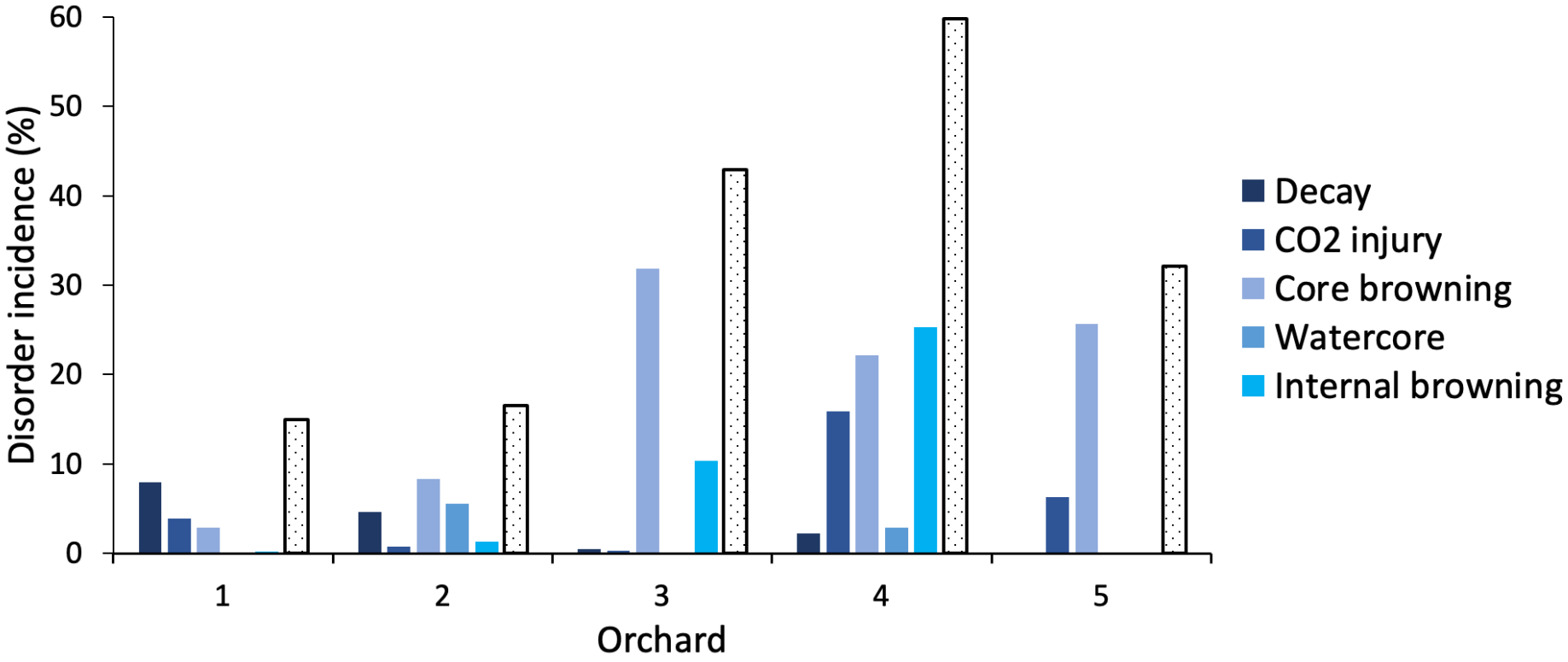
- Ethylene production inhibited by CA and DCA
- Post-storage ethylene most inhibited by DCA
- Recovery of ethylene stimulated by CO_2



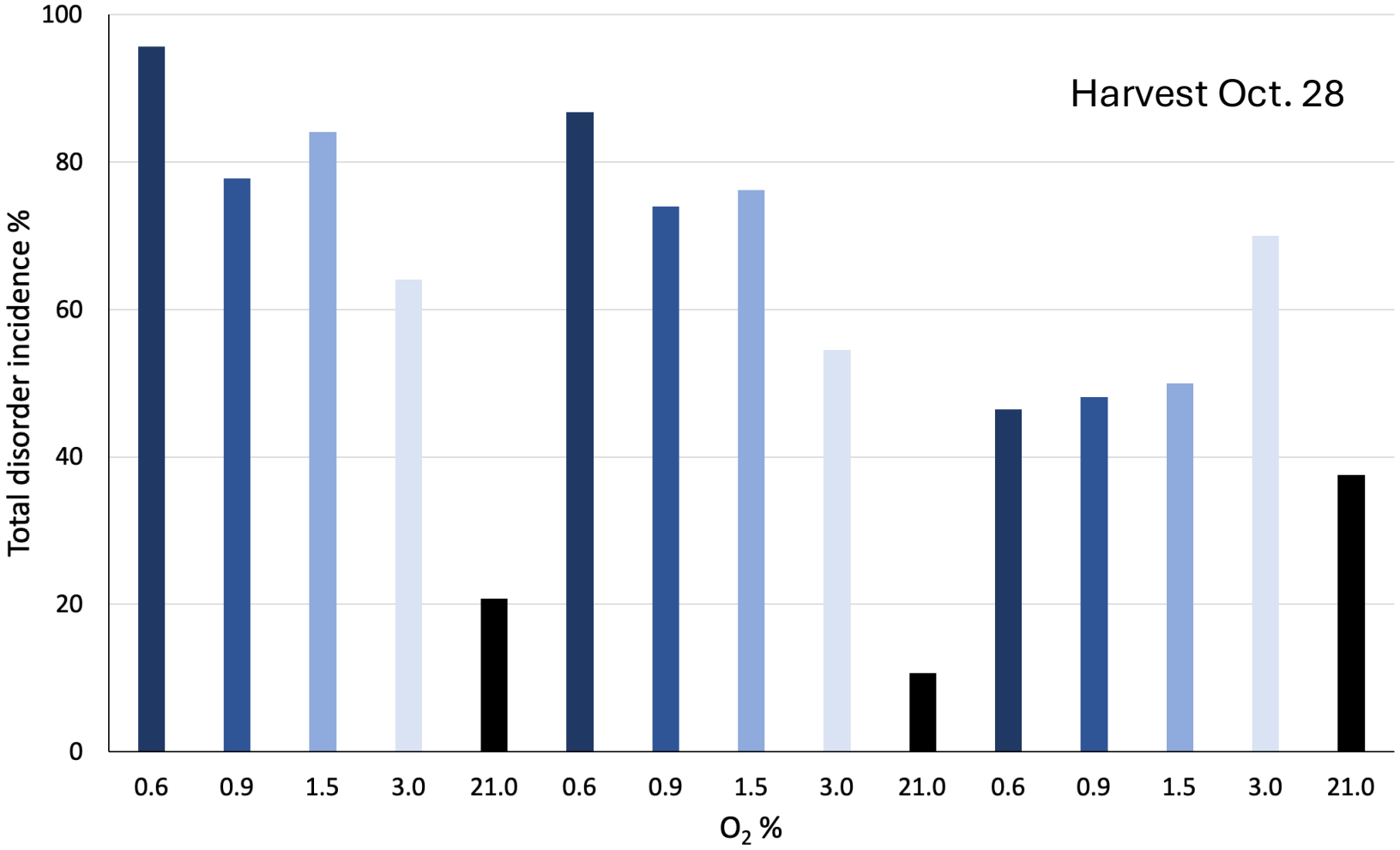
- Evercrisp tolerant to low O_2 levels found in DCA
- Evercrisp relatively tolerant CO_2, even at 0.6 % O_2
- Watercore dissipated by air storage
- DCA and air storage reduces CO_2 injury



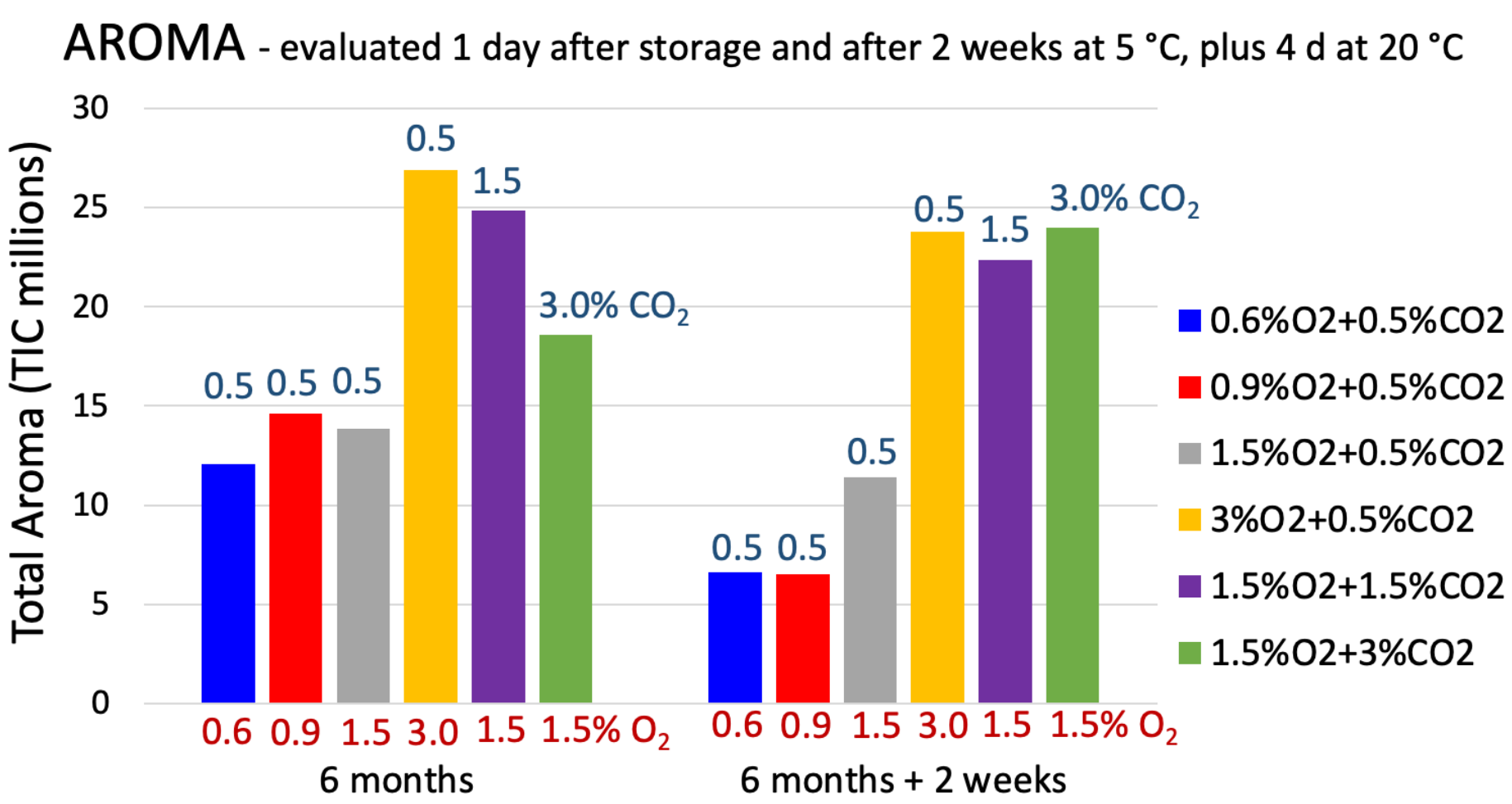
- Slight sensitivity to CO_2 injury above 1.5%
- CO_2 of 1.5% to 3% improves storability and ‘packout’
- The biggest issue is a form of core browning



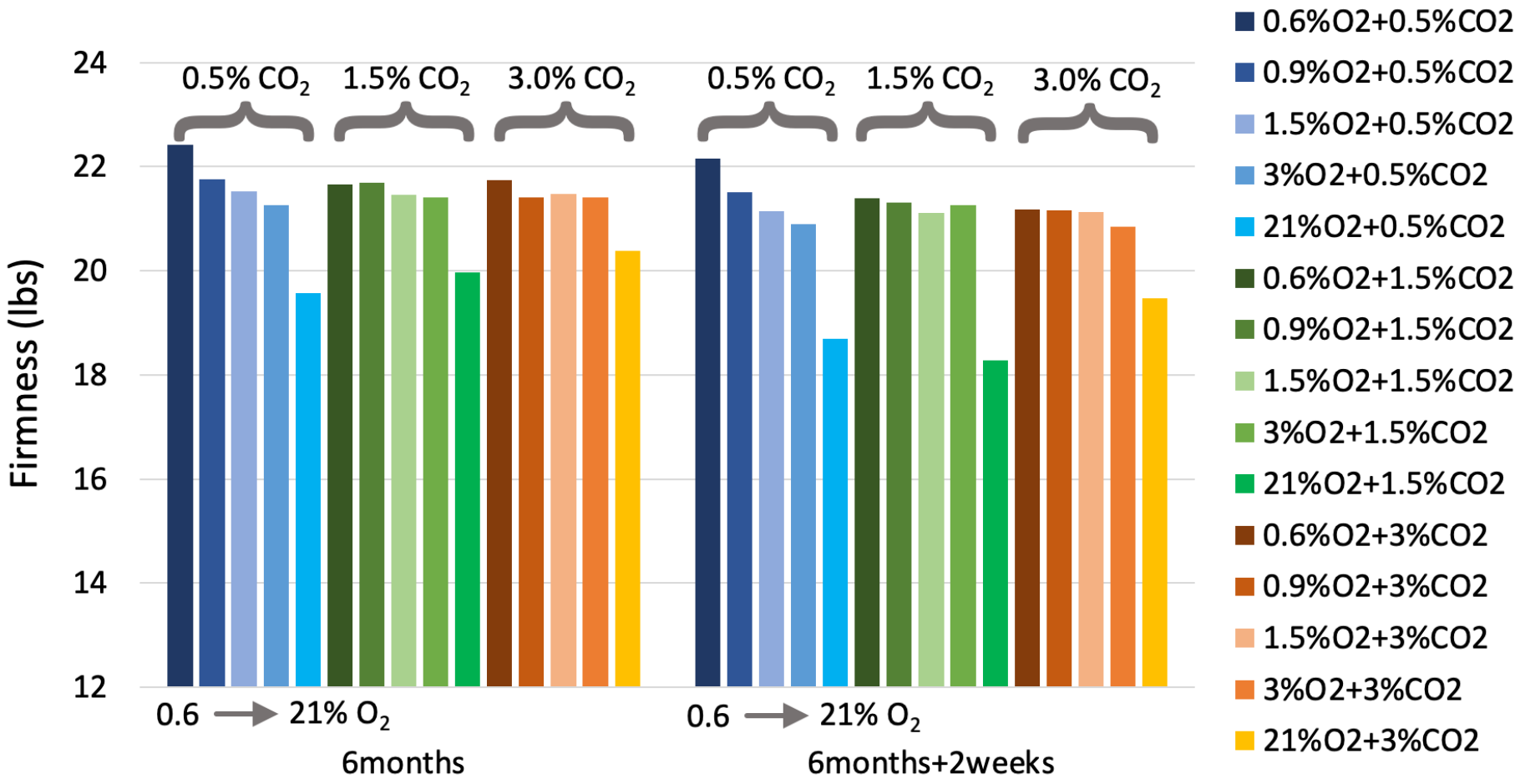
- The devil is in the details! Each orchard experienced different sensitivities to disorders



- In a ‘sensitive’ orchard, DCA may have enhanced disorder incidence.
- Air storage worked just fine
- CO_2 was beneficial



- DCA and 1.5% O_2 CA suppress aroma vol formation
- DCA maintains suppression of aroma volatiles after storage



- CA and DCA maintain firmness better than RA
- DCA best maintains firmness best under low CO_2

SUMMARY COMMENTS

Evercrisp is a dense apple fruit.