CTX MS

2022

Wind tunnel measurements of flow velocities of new optimised bin

Publication

Air velocity in and outside of standard
Large bins with approaching flow in wind tunnel

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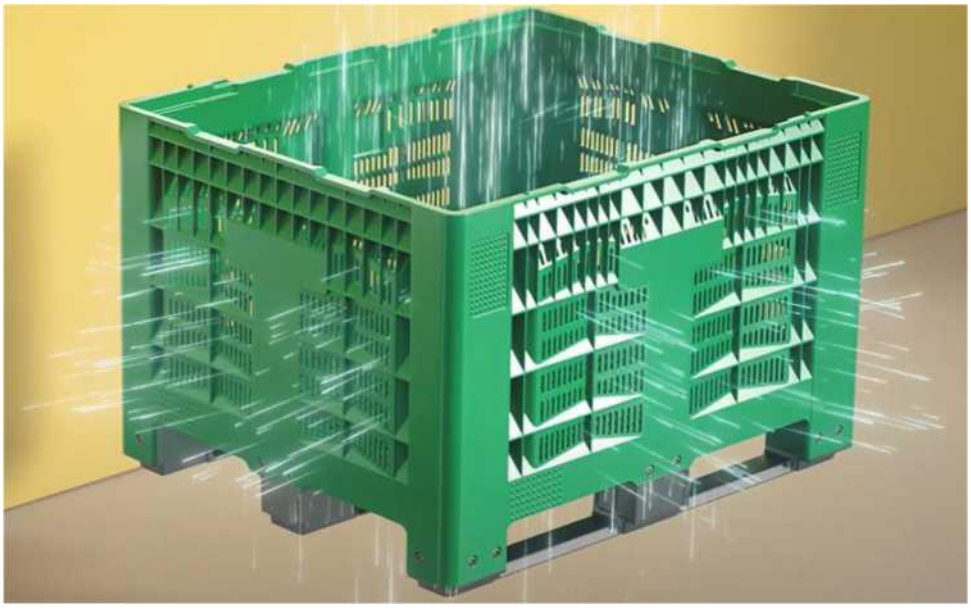

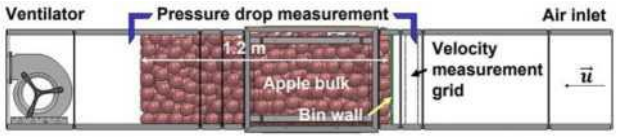

Figure 1: Schematic illustration of test setup.

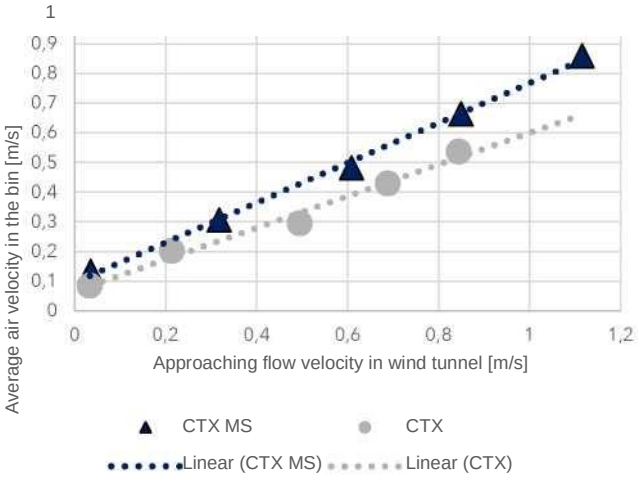

Figure 2: Comparison of measurement results of average air velocities of CTX and CTX MS bins with different approaching flow velocities.

Motivation

Commercially available large plastic bins for apple storage have a small opening area of < 10% (perforation) and consequently significantly less porosity than apples stored in bulk with a percentage of openings of 40%. This means that bin walls produce high air resistance. Flow measurements in an apple store show that air velocity in apple bins between fruit is very low in relation to the environment.

The CTX MS ® has twice the opening area compared to the previous model. In order to evaluate the effects of this method, flow measurements as shown in Figure 1 were performed in a wind tunnel at the Institute for Agricultural Engineering and Bioeconomy ATB.

Test results

Figure 2 shows the average air velocity in the bin dependent on the approaching flow velocity. With flow approaching from the side, perfusion in the CTX MS ® was improved over conventional models by **15-20%**. This results in a significant reduction in energy consumption from the initial point of cooling and improvement in the quality of fruit owing to faster cooling. Calculations by Europlast indicate a reduction in CO2 emissions per bin and storage season of up to 2 kg.