Title Development of engineering design tools to help reduce apple bruising

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Abstract

A large percentage of apples are wasted each year due to damage such as bruising. The apple journey from orchard to supermarket is very complex and apples are subjected to a variety of static and dynamic loads that could result in this damage occurring.

The main aim of this work was to carry out numerical modelling to develop a design tool that can be used to optimise the design of harvesting and sorting equipment and packaging media to reduce the likelihood of apple bruise formation resulting from impact loads. An experimental study, along with analytical calculations, varying apple drop heights and counterface material properties, were used to provide data to validate the numerical modelling.

Good correlation was seen between the models and experiments and this approach combined with previous work on static modelling should provide a comprehensive design tool for reducing the likelihood of apple bruising occurring.