

Title Bruising profile of fresh 'Golden Delicious' apples
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Abstract

It is important to understand how apples bruise in order to prevent or reduce bruising. Tissue from 'Golden Delicious' apples was analyzed to determine the bruising mechanism at different maturity levels. Bruising was induced by an artificial finger attached to an Instron machine applying an external load to fresh picked 'Golden Delicious' apples. To understand the bruising mechanism involved, we used fluorescence microscopy with Calcofluor fluorescent dye to identify cell walls and CDFA to identify cell membranes in the bruised and discolored tissue. Together with SEM, different breakage mechanisms were observed in the bruised area. We observed that 48 hours following damage, the bruised tissue was comprised of dead and live cells, burst, crushed and intact cells. The more intercellular space there was in the tissue, the more tissue damage occurred. Airspaces were the weakest points in the tissue structure, and damage initiated in those points. As apples matured, there was an increase in damaged cells surrounding larger intercellular spaces.