

Title The influence of harvest date and storage conditions on firmness of ‘Golden Delicious Reinders’ apples

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Citation Abstracts, 10th International Controlled & Modified Atmosphere Research Conference, 4-7 April 2009, Antalya, Turkey. 80 pages.

Keyword Firmness; deterioration; apple

Abstract

Harvest date, storage temperature and atmosphere are the main factors determining quality deterioration during storage. The aim of the experiment was to evaluate firmness changes of ‘Golden Delicious Reinders’ apples harvested at different dates during storage under different temperatures and different atmosphere conditions. The results of this experiment will be used for the development of the Decision Support System ‘PeaPle’ (EU ISAFRUIT Project) which aims to simulate changes of fruit quality along various post-harvest chains.

Fruits were harvested three times in 2007 in a commercial orchard of Przybytniak family, located in central Poland. At each harvest fruit weight, internal ethylene concentration, starch index and flesh firmness were determined. Fruits were stored for maximally nine months at three temperatures (-0.5°C, +1°C and +3°C) and two storage atmospheres (3%CO₂+ 1 %O₂ and 3%CO₂+3%O₂). Fruit firmness was measured after app. 2, 4, 6, 7.5 and 9 months storage and after additional shelf life (7 days at +18°C). Changes of firmness of ‘Golden Delicious Reinders’ apples depended on the harvest date and storage conditions (temperature and atmosphere composition).

Successive harvests were characterized by slightly decreasing fruit firmness - from 71.8 N (first harvest) to 70.1 N (third harvest). After nine months of storage, fruit firmness was lowest (ca. 50 N) in apples stored at the highest storage temperature (30°C) and the highest oxygen level (3%), irrespective harvest date. Fruit firmness further declined during shelf life. Apples from the first harvest stored at -0.5°C under 3%CO₂+ 1 %O₂ kept fruit firmness best.

The experiment was carried out within the ISAFRUIT project, funded by the European Commission under the Thematic Priority 5-Food Quality and Safety of the 6th Framework Programme of RTD (Contract no. FP6-FOOD-CT-2006016279).