Abstract:

CA-related internal flesh browning in ‘Elstar’ apples associated with formation of cavities can be observed with increasing importance in the last few years, mainly in warmer apple growing areas of South-West Germany. The occurrence of these disorders seems to be influenced by pre- and postharvest factors. In this investigation, fruits from several orchards with different pruning time (winter, summer) were placed in six different CA-concentrations (%CO2 + %O2: 0.6+1.2; 2.5+1.2; 5+1.2; 0.6+2.5; 2.5+2.5; 5+2.5) at 1°C with various times in delay of establishing CA-conditions (0; 20; 30; 40 days). After 5 months of CA-storage, ‘Elstar’ apples developed a lot of browning injuries with great differences between the different orchards. The majority of disorders was developed during the first 1.5 months of storage, whilst only a small increase occurred during the following time till the end of the 5 months storage period. More browning problems exhibited apples from winter pruned trees. Under different CA conditions, ‘Elstar’ apples were more damaged in higher CO2 concentration combined with higher O2. Delayed CA-storage regime reduced significantly flesh browning. The optimum duration of CA-delay was 30 days. The energy charge (ATP:ADP ratio) of fruit tissue from delayed fruits remained higher during the 5-months storage period according to the duration of the delay and was also in relation with respiration behaviour. However, firmness loss of 30-days-delayed apples was much higher than of rapid CA-stored fruits. More effort is necessary to develop a storage regime capable to minimize browning disorders and firmness loss.