

Abstract:

Boron supply of fruit tissue seems to alleviate the incidence of CA-related browning disorders in 'Conference' pears, which occur mainly under high CO₂ and/ or low O₂ concentrations. In three subsequent years the effect of pre-harvest boron sprays on various physiological parameters of pear fruit stored under high CO₂ CA-conditions was tested. Up to six times before harvest, trees of 'Conference' pears were sprayed with boron, alone or in combination with calcium. Following harvest, fruit were stored at -0.5 °C, 5% CO₂ + 2% O₂ CA-conditions for 5 months. During this time, the pears were monitored for physiological disorders, fruit quality, respiration, and energy charge of fruit tissue.

Results showed that control fruit were more affected by internal browning than those treated with boron. The lowest incidence of browning disorders, however, was obtained in fruit sprayed with boron in combination with calcium. Moreover, at harvest time, these fruit were greener, firmer and had less titratable acidity than control fruit.

Boron-treated fruit respired at lower rates harvest and during the entire storage period. However, the energy status, expressed as ATP:ADP-ratio was higher in boron-treated fruit. This may be caused by a lower energy requirement resulting in a higher net amount of energy being available for maintenance of cell integrity and function.