Title Influence of preharvest calcium treatment on apple biochemical content

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Abstract

The effect of calcium treatment on apple external quality and physiological disorders has been studied extensively; however the effect on internal quality is often left aside. Nowadays there is an increasing need for knowledge on how cultural practices influence health beneficial substances in fruit. The aim of the current experiment undertaken at the Estonian Agricultural University during 2002-2004 was to determine the influence of preharvest Ca treatment ($CaNO_3$+$CaCl_2$) on apple (cvs. Cultivars Krameri Tuvioun and Talvenauding) biochemical content at harvest and during storage. Preharvest calcium – treatments were carried out three times in summer 2002 and four times in summer 2003. In 2002 $Ca(NO_3)_2$1% solution was used in July, 9th and 30th at the amount of 660 L ha-1, and $CaCl_2$ 0.5% solution was applied in August, 22ndat the same amount. In 2003 $Ca(NO_3)_2$ was applied in July, 14th and 28th and $CaCl_2$ in 8th of August and 1st of September. Samples of 300 fruits per plot were picked at optimum harvest stage and stored in a commercial cool store in temperature ranging from+2 to 5°C and in RH ranging from 80…85% in normal atmosphere. The fruit of 'Krameri Tuvioun' was stored for 4 months and for 'Talvenauding' 6 months. Content of fruit dry matter, soluble solids and titratable acids were determined at harvest, after four months of storage and at the end of storage in both years. Fruit firmness, fruit skin colour and vitamin C content was determined in a second experimental year. At harvest in the first experimental year content of fruit soluble solids, titratable acids and dry matter was significantly reduced by calcium treatment. At harvest in second experimental year fruit dry matter was reduced and content of soluble solids was increased by calcium treatment, whereas fruit firmness, content of titratable acids and vitamin C remained unaffected. After four months of storage in the first experimental year content of fruit dry matter was increased and other characters were not influenced by calcium treatment. In the second experimental year fruit dry matter was decreased and other characters were not influenced by calcium treatment. Correlation's between spoilage, mineral and biochemical will e discussed.