

Title Analysis of 'McIntosh' apple flavonoid and antioxidant levels
Author D.D. MacLean, D.P. Murr and J.R. DeEll
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Abstract

The total antioxidant capacity (TAC; nmoles of Trolox equivalents•g⁻¹) and flavonoid content of 'McIntosh' (*Malus × domestica*) apple was determined using a modified total oxyradical scavenging capacity (TOSC) assay and by HPLC/DAD, respectively. 'McIntosh' fruit were harvested at an early (-6 d), optimal (0 d) and late (+6 d) commercial maturity and treated with 0.6 μl·L⁻¹ 1-MCP before being placed in cold storage (0 to 1°C) for 30, 60 or 120 d. After removal from storage, fruit were held at room temperature (~20°C) for 1 d prior to the separation and extraction of the red and green skin tissue components. The treatment of 1-MCP resulted in a significant retention of TAC in fruit harvested at the optimal and late commercial maturities, as well as throughout 120 d of cold storage. The TAC of both the 'McIntosh' red and green tissue increased from the early to optimal commercial maturity and decreased thereafter. Likewise, the TAC in both tissues increased during cold storage from 30 to 60 d and then decreased thereafter. In all cases, 'McIntosh' red tissue demonstrated about a 15% higher TAC value than 'McIntosh' green tissue. As well, treatment with 1-MCP resulted in 10 to 15% higher TAC values than non-treated fruit. Cyanidin 3-galactoside content was stable for the first 60 d of storage and then decreased significantly thereafter, whereas quercetin 3-galactoside content remained relatively stable throughout the 120 d of storage. In contrast, chlorogenic acid content increased significantly during storage and was inhibited in the green tissue by a treatment of 1-MCP at the early harvest maturity. This decrease in TAC and increase in chlorogenic acid during storage may be related to the susceptibility of 'McIntosh' to the development of superficial scald. This study demonstrated the significance of a treatment of 1-MCP in maintaining the intrinsic antioxidant levels of 'McIntosh' apple during cold storage.