Title Detection of watercore in ‘Gloster’ apples using thermography

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Abstract

Watercore is an internal physiological disorder of certain apple cultivars in which the intercellular air spaces throughout the fruit become filled with fluid resulting in characteristic translucent tissue. Detection methods based on colour vision of the fruit surface are not applicable because the injury is visible only in fruit with very severe injury. Therefore, we decided to use dynamic thermography to distinguish affected and unaffected apples. The derivative of apple temperature in time per apple mass is a good parameter to evaluate the differences in thermal properties between apples with and without watercore affected tissues. For apples with watercore the rates of temperature increase per mass in particular initial stages of heating were considerably lower than for apples without watercore affected tissue, irrespective of the part of the fruit surface from which the measurements were made. A good correlation was found between the derivative of apple temperature in time per apple mass and the fruit density.