Title Seeking a robust strategy to use chlorophyll fluorescence to assess physiological damage of fresh produce

Author D. Rees, P. Simantara, M. Ross, S. Brownridge, A. Westby, D. Johnson and R. Poole

Citation ISHS Acta Horticulturae 858:399-406. 2010.

Keyword Fv/Fm; chilling injury; heat stress; photoinhibition; cucumber; pepper; asparagus; apple

Abstract

Chlorophyll fluorescence has been tested by many researchers as a non-invasive method to assess physiological damage in chlorophyll containing fruits and vegetables. The characteristic Fv/Fm is most commonly considered. One draw-back of this method is that the fluorescence signal is affected primarily by the state of photosystem II, which is one of the components most sensitive to stresses, including heat, chilling and oxidative stress, so that the Fv/Fm may be more sensitive than the overall tissue. A more reliable strategy may be to look at the ability of the tissues to re-synthesize photosystem II after damage, by looking at the long-term rate of Fv/Fm recovery. This strategy shows promising results in predicting chilling injury in peppers and cucumbers, and heat stress in asparagus. Trials are also reported that attempt to predict low temperature injury in apples, but the results were not definitive.