

**Title** History, current situation and future prospects for dynamic controlled atmosphere (DCA) storage of fruits and vegetables

**Author** Robert K. Prange, A. Harrison Wrihr, John M. DeLong and Angelo Zanella

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### **Abstract**

The use of chlorophyll fluorescence in fruit and vegetable storage (HarvestWatch™) was first introduced at the ISHS CA symposium in 2001 in Rotterdam, the Netherlands and was first commercially adopted in the 2003-2004 storage season in Washington State, USA and South Tyrol, Italy. Although there are many potential post-harvest applications for chlorophyll fluorescence which will be reviewed, research and commercial adoption has focussed primarily on its use in optimising the O<sub>2</sub> concentration in dynamic controlled-atmosphere (DCA) storage of fruits and vegetables. This is achieved through a novel method of detection of a sudden change in fluorescence at the lower O<sub>2</sub> limit (LOL). The reasons for its adoption are: real-time monitoring and control of product, pesticide-free technique, accurate determination of LOL, control of storage disorders, especially control of superficial scald in susceptible apple and pear cultivars without use of pesticides such as diphenylamine (DPA), improved retention of quality, possible flavour enhancement and detection of senescence, decay or incorrect storage conditions, i.e. temperature. A summary of its current use, based on a world-wide survey of users, along with detailed storage protocols using this technique will be presented. Preliminary results applications in other high value fruits, e.g. extension of green-life in banana, will be presented as evidence of possible future application.