Abstract:

The use of CA (controlled atmosphere) facilities for long-term storage of produce has long been accepted as the optimum method for preserving fruits and vegetables. CA facilities use a range of sensor technologies to monitor temperature, oxygen and carbon dioxide levels within the controlled environment. However, even with state-of-the art CA technology poor quality product is occasionally encountered during storage. Satlantic Incorporated, in conjunction with Agriculture and Agri-Food Canada, Kentville, Nova Scotia, has developed an innovative technology allowing continuous monitoring of produce health during long-term CA storage. The FIRM (Fluorescence Interactive Response Monitor) system uses low power light sources to stimulate photo systems inside a small sample of produce. Under conditions of low oxygen chlorophyll contained in plants fluoresces. Detection technology senses the response from the produce and feeds it back to an analytical software tool (HarvestWatch™) where the output is displayed in graph format. The current study assesses the variability of the produce response to low oxygen exposure, as measured by the HarvestWatch™ system, within a batch of 200 apple fruit from a single grower source. The work was carried out to determine the sample size required to provide a representative indicator of produce health. The relationship between individual fruit responses to low oxygen stress, as measured by HarvestWatch™ and respiration rate of the fruit are also investigated.