Abstract

We demonstrate the feasibility of assaying and predicting post-harvest damage in lemons by monitoring chlorophyll (Chl) fluorescence. Fruit quality was assayed using a commercial instrument that determines photosynthetic performance by imaging Chl fluorescence parameters under different irradiances. Images of Chl fluorescence from individual lemons reveal that photosynthesis is active throughout the post-harvest ripening process. Because photosynthesis is highly sensitive to biotic and abiotic stress, variations in Chl fluorescence parameters over the surface of a lemon fruit can be used to predict areas that will eventually exhibit visible damage. The technique is able to distinguish between mould-infected areas that eventually spread over the surface of the fruit, and damaged areas that do not increase in size during ripening. This study demonstrates the potential for using rapid imaging of Chl fluorescence in post-harvest fruit to develop an automated device that can identify and remove poor quality fruit long before visible damage appears.