Title Relationship between changes in colour and pigment content during spathe regreening of *Zantedeschia* 'Best Gold'

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Citation Postharvest Biology and Technology. Volume 67, May 2012, Pages 124–129

Keywords Carotenoid; Chlorophyll; Lightness; Chroma; Hue angle; Postharvest

Abstract

Spathes of *Zantedeschia* 'Best Gold' commence regreening approximately 2 d after reaching commercial maturity. We sought to characterize the changes in pigment content and distribution during the regreening of 'Best Gold', and correlate pigment changes with colour coordinates including lightness, chroma and hue angle (H°). Within the 14-d period after commercial maturity, the abaxial surface of spathes turned from yellow to green, which was quantified as an increase in H° and a decrease in both lightness and chroma. This colour change was accompanied by a 10-fold increase in the content of both chlorophyll *a* and chlorophyll *b* and a 20% decrease in the content of total carotenoid within the subepidermis of the abaxial surface. For the abaxial surface, within the 14-d period, the content of chlorophyll *a*, *b* and total carotenoid were all highly correlated with lightness, chroma and H°. The highest correlation ($r = 0.98$) was between H° and chlorophyll *a* or total chlorophyll on a per area basis. There was a quadratic relationship between the content of chlorophyll *a*, *b* or total chlorophyll with H°, accounting for more than 97% of variation. Hence, measuring the change in H° can be used to infer a change in chlorophyll content and, therefore, evaluate the progress of regreening for future research in spathe regreening of 'Best Gold'. Some limitations of using H° to infer direct changes in chlorophyll content include that its sensitivity is not consistent at different stages of regreening and is only suitable for evaluating the re-greening on the abaxial surface of 'Best Gold'.