

Storage with apple fruit to improve peel color and maintain freshness of Newhall navel orange

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Abstract

A novel biological treatment of staying with commercially mature apple fruits was proposed to promote the peel coloration of 'Newhall' navel orange fruit (*Citrus sinensis* Osbeck), which could conduce to the formation of uniform orange red peel color. At 15 days after treatment (DAT), the staying with apple (SWA) treatment led to a nearly 4-fold increase in the total carotenoid content compared with the control. Specifically, the red color apocarotenoid β -citraurin showed the highest degree of enhancement (~6 fold) under SWA treatment. Simultaneously, the expression level of β -citraurin biosynthetic gene *carotenoid cleavage dioxygenase 4b* (*CCD4b*) was dramatically induced (about 35 folds). Furthermore, SWA had the same effect of promoting coloration and obviously alleviate calyx senescence of citrus fruit compared with ethylene treatment. In conclusion, SWA treatment is a potential environment-friendly and recyclable postharvest technology to improve peel color and maintain fruit freshness for citrus.