

The effect of temperature on the quality of Japanese bunching onion (*Allium fistulosum* L. 'Kujyo')

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Abstract

The Japanese bunching onion (*Allium fistulosum* L. 'Kujyo') is a highly perishable crop. Japanese bunching onions have a relatively short shelf life in terms of external appearance. After harvesting, Japanese bunching onion leaf tips become yellow, rendering them unacceptable for consumption. This study evaluated the effect of temperature (4 and 25°C) on physiological changes in the Japanese bunching onion. Hue angle value of bunching onions stored at 25°C rapidly declined while it remained unchanged in onions at 4°C. The L value of leaves stored at 25°C was higher than those stored at 4°C. As expected, postharvest color change of bunching onions was correlated with chlorophyll degradation. Chlorophyll *a*, chlorophyll *b* and total chlorophyll contents of Japanese bunching onions sharply decreased in leaves stored at 25°C compared with 4°C. These results indicated that low temperatures delayed yellowing of bunching onion leaves as a consequence of delay in chlorophyll breakdown during storage. Interestingly, we observed chlorophyll and its derivatives in vacuoles of bunching onions. This suggested that degradation of chlorophyll in bunching onions occurred in both chloroplasts and vacuoles.