

Title Effects of controlled atmosphere storage on storage life and self life of the Japanese onion cultivar Super-Kitamomiji

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Abstract

The amount of bulb onions produced in Japan every year is about 1.2 million tons, over half of that amount being produced in Hokkaido. Cultivars for long-term storage are generally stored in refrigerators after harvest, but the time limit for distribution is April of the following year due to sprouting and/or rooting. There is therefore a need to prolong the time limit for distribution. It has been reported that controlled atmosphere (CA) storage is effective for prolonging the storage life of onions. The purpose of this study was therefore to investigate the effects of CA storage on storage life and shelf life of 'Super-Kitamomiji', a leading cultivar in Hokkaido, and to assess the practicality of a CA storage facility.

Bulbs were stored for 92 days (until February 18), 135 days (until April 2) and 196 days (until June 2) in a regular air refrigerator (-0.5°C, 80% RH) and in a CA refrigerator (+1°C, 80% RH, O₂: 1%, CO₂: 1%), and grading, sprout and root growth, firmness, pyruvate content and sugar content were investigated. The same items were also investigated in the bulbs after storage at 15°C for 14 days in order to determine shelf life.

Sprout growth and root growth were inhibited under CA storage, the ratio of unmarketable bulbs under CA storage (1.8%) being significantly lower than that under regular air storage (30.8%). The ratio of unmarketable bulbs 14 days after CA storage was also lower than that after regular air storage. Total sugar content and pyruvate content increased during storage, but there was no significant difference between the contents in bulbs after regular air storage and CA storage. The results suggested that CA storage will enable the time limit for distribution of onions to be extended from April to June. Based on these results, CA facilities were constructed in Kitami (2,600 t, 2 rooms) and in Furano (6,700 t, 7 rooms), and bulbs have been stored in these facilities up until July.