

Kanokwan Kubnop 2011: The Quality of Fresh Longan Fumigated with Sulfur Dioxide under Vertical Forced-Air Technique. Master of Science (Agriculture), Major Field: Horticulture, Department of Horticulture. Thesis Advisor: Professor Jingtair Siriphanich, Ph.D. 107 pages.

An improved SO₂ fumigation process had been developed for longan by substituting a horizontal forced-air with vertical forced-air technique. It can increase air flow rate in the packages of longan, especially the commercial trapezoidal shaped-basket. The objective of this study is to evaluate the quality of fresh longan with SO₂ under vertical forced-air technique. In experiment 1, two types of baskets and vertical forced-air at 3 air flow rates of 0.6, 0.8 and 1.0 m³/s were studied. It was revealed that the sulfite residues in the peel and pulp of longans using both rectangle and trapezoidal shaped-baskets, in all air flow rate, were not different. The post-harvest decay and browning on longan peel did not appear during storage at 2 °C in 95 % RH for 20 days and soluble solids content was not different. In experiment 2, two sources of SO₂ gas, the direct SO₂ gas from a compressed tank and the burning of sulfur powder, as well as SO₂ concentrations of 2,000 and 4,000 µl/l, at the end of the process, were studied. The results revealed that the sulfite residue in the peel of longans was greater when treated with SO₂ gas directly from the compressed tanks as compared to that from the burning of sulfur powder. The sulfite residues in the pulp of longans treated with both source of SO₂ were alike. The sulfite residue in the peel and pulp of longans treated with 2,000 µl/l SO₂ concentration at the end of the process was less than with 4,000 µl/l. The post-harvest decay and browning on longan peel did not occur during storage time and soluble solids content was not different. In experiment 3, longan treated under vertical forced-air technique and the conventional application method were compared. As a result, the sulfite residues in the peel and pulp of longans treated under vertical forced-air technique was less than under the conventional application. This technique was also effective in preventing post-harvest decay and browning on longan peel similar to results obtained from a commercial fumigation process and better than the untreated control. It is recommended that the shipper should fumigate fresh longan in the trapezoidal shaped basket using the vertical forced-air technique at the air flow rate 0.6 m³/s by direct SO₂ gas from a compressed gas tank, with a concentration of 4,000 µl/l SO₂ at the end on the process.

Student's signature

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