

## Study on Technological Development for Reducing the Sulfur Dioxide Residue Problem in Fresh Longan for Exporting

**Authors :** Wittaya Apai, Satippong Rattanakam, Suttinee Likhitrarung, Nuttanai Tungmunkongvorakul, Sompetch Jaroensuk

**Abstract :** The objective of this study was to find some alternative ways to decrease sulfur dioxide (SO<sub>2</sub>) residue problem and prolong storage life in fresh longan for export. Office of Agricultural Research and Development Region 1, Chiang Mai province conducted the research and development from 2016-2018. A grade longan cv. Daw fruit with panicle attached was placed in 11.5 kg commercial perforated plastic basket. They had 5 selected treatments comprising of 3 baskets as replication for each treatment, i.e. 1.5% SO<sub>2</sub> fumigation prior to insert SO<sub>2</sub>-generated pads (Uvasys®) (1.5% SO<sub>2</sub>+SO<sub>2</sub> pad), dipping in 5% hydrochloric acid (HCl) mixed with 1% sodium metabisulfite (SMS) for 5 min (5% HCl +1% SMS), ozone (O<sub>3</sub>) fumigation for 1 hours (h) prior to 1.5% SO<sub>2</sub> fumigation (O<sub>3</sub> 1 h+1.5% SO<sub>2</sub>), 1.5% SO<sub>2</sub> fumigation prior to O<sub>3</sub> fumigation for 1 h (1.5% SO<sub>2</sub>+O<sub>3</sub> 1 h) and 1.5% SO<sub>2</sub> fumigation alone as commercial treatment (1.5% SO<sub>2</sub>). They were stored at 5 °C, 90% relative humidity (RH) for 40-80 days. The results found that the possible treatments were 1.5% SO<sub>2</sub>+O<sub>3</sub> 1 h and 5% HCl +1% SMS respectively and prevented pericarp browning for 80 days at 5 °C. There were no significant changes in some parameters in any treatments; 1.5% SO<sub>2</sub>+O<sub>3</sub> 1 h and 1.5% SO<sub>2</sub> during storage, i.e., pericarp browning, flesh discoloration, disease incidence (%) and sensory evaluation during storage. Application 1.5% SO<sub>2</sub>+O<sub>3</sub> 1 h had a tendency less both SO<sub>2</sub> residue in fruit and disease incidence (%) including brighter pericarp color as compared with commercial 1.5% SO<sub>2</sub> alone. Moreover, HCl 5%+SMS 1% showed the least SO<sub>2</sub> residue in whole fruit below codex tolerance at 50 mg/kg throughout period of time. The fruit treated with 1.5% SO<sub>2</sub>+O<sub>3</sub> 1 h, 1.5% SO<sub>2</sub>, 5% HCl+1% SMS, O<sub>3</sub> 1 h+1.5% SO<sub>2</sub>, and 1.5% SO<sub>2</sub>+SO<sub>2</sub> pad could prolong storage life for 40, 40, 40, 30 and 30 days respectively at 5°C, 90% RH. Thus, application 1.5% SO<sub>2</sub>+O<sub>3</sub> 1 h and/or 5% HCl +1% SMS could be used for extending shelf life fresh longan exported to restricted countries due to less SO<sub>2</sub> residue and fruit quality was maintained as compared with the conventional method.

**Keywords :** longan, sulfur dioxide, ozone fumigation, sodium metabisulfite

**Conference Title :** ICPBT 2019 : International Conference on Postharvest Biology and Technology

**Conference Location :** Venice, Italy

**Conference Dates :** April 11-12, 2019