

## Synergistic Effect of Chlorine Dioxide and Temperature-based Curing Method on Storage Stability of Sweet Potato

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### [Introduction]

Curing to promote wound healing is very important for improving the storage stability of sweet potatoes. In general, sweet potatoes are recommended to cure for 4 days or more at high temperature (32-34 °C) and high relative humidity (85-95%). Previous work has shown the possibility of promoting wound healing without high temperature by applying ClO<sub>2</sub> gas (100 ppm x 2 h) to the curing process. However, high concentrations of ClO<sub>2</sub> gas treatment resulted in weight loss of sweet potatoes, requiring a lower concentration of ClO<sub>2</sub> gas treatment. In this study, it was investigated that whether ClO<sub>2</sub> gas treatment (10-40 ppm, 10 m) could be used in parallel with the existing temperature-based curing method (TCm; 32-34 °C, 95%RH). Furthermore, it has been examined whether ClO<sub>2</sub> gas treatment may be helpful to reduce the curing period.

### [Materials and Methods]

Sweet potatoes of the 7 cultivars harvested in October 2016 and September 2017 were used in the study. In the TCm, harvested sweet potatoes were cured for 4 days at 33 °C and 95%RH. ClO<sub>2</sub> gas treatment was performed in enclosed container with a ClO<sub>2</sub> gas generator (PurgoFarm Co. Ltd., Hwasung, Korea) and a ClO<sub>2</sub> gas detector (Analytical Technology, PA, USA). After all treatment, sweet potatoes were stored in storage house (13 °C) of National Institute of Crop Science (Muan). The percentage of spoilage and marketable weight in the 7 cultivars was investigated every 2 weeks.

### [Results and Discussions]

In 18 weeks storage, dry type sweet potatoes treated with less than 20 ppm of ClO<sub>2</sub> gas showed improved storage stability over non-treated sweet potatoes. ClO<sub>2</sub> gas treatment at 30-40 ppm improved storage stability of moist type sweet potatoes, "Dahomi" and "Juhwangmi". However, most of sweet potato cultivars maintained the highest marketable weight level in TCm. ClO<sub>2</sub> gas treatment was more effective in parallel with TCm. In high dry matter sweet potatoes cultivars, the spoilage was decreased and marketable weight was showed no significant decrease with the ClO<sub>2</sub> gas treatment and TCm. In the case of moist type sweet potatoes, there was no significant difference in percentage of spoilage and marketable weight compared with the control even though the curing period was shortened by 1 day. However, "Sinjami" and "Pungwonmi", which have poor storage stability, did not have sufficient effect to improve storage stability by ClO<sub>2</sub> gas treatment.

### [Acknowledgements]

This work was carried out with the support of "Cooperative Research Program for Agriculture Science & Technology Development (Project No. PJ01133203)" Rural Development Administration, Republic of Korea.

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