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New curing method using gaseous oxidant on sweet potato (*Ipomoea batatas*)

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Abstract

In Asia, sweet potato (*Ipomoea batatas*) is a very important crop for starch production. Approximately 74.3% of the total sweet potato production quantity is produced in Asia (FAO, 2014) and China is the largest producer of sweet potato. Post-harvest management is particularly important because it is difficult to maintain the quality as well as quantity of sweet potatoes. Despite the importance of post-harvest management, researches on sweet potato have been focused on production-related study such as breeding of new variety, improved techniques of cultivation, so there is limited research on storage after harvest. Curing is a normal practice after sweet potato harvest to promote wound healing and extend postharvest storage life. In Korea, harvested sweet potatoes are usually cured for 4 to 7 days at 30-33°C and 80-95% relative humidity within one week. Since the optimum storage temperature of sweet potato is regarded as 15-20°C, additional facilities and costs are required to raise the temperature for curing. However, the majority of small farmers do not have the capacity to provide additional facilities and costs. This study was initiated to suggest a new curing method to accelerate the wound healing by applying chemical oxidation to the wound surface of sweet potato. Oxidative stress is known to play an important role in the synthesis of secondary metabolites including lignin. In addition, chemical oxidation can be applied to prevent spoilage caused by microorganisms. Powerful gaseous oxidant with excellent penetration ability and superior sterilization effect was selected for this study. Lignification, weight loss, and spoilage rate of artificially wounded sweet potatoes were investigated after oxidant fumigation. There were clear differences in morphological analysis such as lignification pattern, lignin deposition color, and continuity of lignified cell layers between oxidant-fumigated sweet potatoes and control. These results show that gaseous oxidant can be used to supplement or replace the curing practice, to improve shelf-life as well as curing cost reduction.

Keywords: Sweet potato, *Ipomoea batatas*, Curing, Wound healing, Lignin

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