

## Grape news: New treatment combination safe alternative to sulfur dioxide

April 16 2010

---



These are commercially packed cluster grapes showing typical decay after four months. Credit: Photo by Liping Kou

Packaged fresh-cut grapes are becoming increasingly popular with consumers who like the convenience and health benefits of these ready-to-eat fruits. To keep table grapes fresh and increase shelf life, scientists are seeking advanced techniques that provide healthy, safe alternatives to conventional packing methods. Researchers from the U.S. Department of Agriculture's Agricultural Research Service (USDA ARS) have developed and tested an effective new technique that combines hot water treatment, rachis removal, and modified atmosphere packaging (MA) to extend the shelf life of table grapes.

Commercially packaged table grapes stored in clusters in perforated packaging have a short shelf life—typically 8 to 10 weeks—as a result of

their exposure to the environment. [Grape](#) shelf life is often shortened by factors including fruit weight loss, stem browning, softening, shattering, and decay. Because of its effectiveness in delaying stem browning and decay, [sulfur dioxide gas](#) (SO<sub>2</sub>) is currently the treatment of choice in many countries for prolonging shelf life of grapes. There are disadvantages to sulfur dioxide use, however. The concentration of SO<sub>2</sub> necessary to inhibit [fungal growth](#) may induce injuries in grape fruits and stems, and sulfite residues pose a health risk for some individuals. Applications of SO<sub>2</sub> have been restricted in many countries, making it essential to identify safe, alternative technologies that effectively control fungal growth and assure high-quality fruit.

Yaguang Luo and William Conway from the USDS ARS, in collaboration with Liping Kou, Wu Ding, and Xinghua Liu from China's Northwest A&F University, recently published a report in HortScience that explored alternatives to [sulfur dioxide](#) for maintaining quality of table grapes, including various combinations of rachis removal, chlorinated wash, hot water treatment, and modified atmosphere packaging.

Grapes were prepared by cutting off the rachis 1 to 2 mm from the fruit or by keeping the clusters intact. After initial preparation, short-stem and cluster grapes were subjected to chlorinated wash and/or hot water (45°C for 8 minutes) treatment and packaged in plastic trays sealed with a gas-permeable film. The treated grapes, as well as the commercially packed grapes in their original packages, were stored at 5°C for up to 4 weeks.

According to the Kou, a visiting scientist from China and the study's lead researcher, the hot water treatment resulted in significantly higher oxygen retention and lower carbon dioxide accumulation in packages, firmer texture, higher overall visual quality, lower decay rate, and lower microbial populations than other treatments or commercially packed grapes. Grapes that were cut from the rachis and treated with hot water

and chlorine maintained the highest quality for 4 weeks, with the least decay among all treatments. A chlorine prewash treatment significantly reduced microbial populations on cluster grapes and maintained better overall quality.

Kou concluded that "the combination of these treatments maintained excellent visual quality throughout the entire storage duration, whereas the commercially packaged grapes became decayed and their quality declined to a level that was unacceptable. The combination treatment was successful in reducing spoilage microbes, preventing dehydration, and delaying softening and senescence of grapes."

**More information:** The complete study and abstract are available on the ASHS HortScience electronic journal web site:

[hortsci.ashspublications.org/content/44/7/1947](https://hortsci.ashspublications.org/content/44/7/1947)

Provided by American Society for Horticultural Science

Citation: Grape news: New treatment combination safe alternative to sulfur dioxide (2010, April 16) retrieved 27 April 2024 from <https://phys.org/news/2010-04-grape-news-treatment-combination-safe.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.