

Electrostatic atomised water particles reduces postharvest lignification and maintain asparagus quality

Wai Wai Lwin, Varit Srilaong, Panida Boonyaritthongchai, Chalermchai Wongs-Aree, and NutthachaiP ongprasert

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Abstract

Asparagus has a high respiration rate and short shelf-life. The loss in quality is observed through the wrinkling of stems, loss of green colour and toughening. The objective of this study was to reduce the spear lignification and maintain the quality of asparagus using electrostatic atomised water particle (EAWP) treatment. Asparagus were treated with EAWPs for 0 (control) and 90 min and kept at 4 °C for 24 days. The results showed that EAWP treatment for 90 min maintained the colour and total chlorophyll content of the spears. EAWP treatment retarded the respiration rate and ethylene production, reduced weight loss and induced stomatal closure in the stored asparagus. Additionally, the treatment significantly delayed the rise in the activities of phenylalanine ammonia-lyase (PAL), cinnamyl alcohol dehydrogenase (CAD) and peroxidase (POD), which were associated with the inhibition of lignin and cellulose accumulation. Similarly, treated asparagus showed lower hydrogen peroxide content than that of the control but had higher nitric oxide content during the initial days in storage, and decreased thereafter. Distinctly, total phenolic in EAWP treated asparagus was higher than the control. These findings suggest that EAWPs worked as a stress treatment to inhibit the lignification process and maintained the quality of asparagus during storage at 4 °C.