

Objectives and Rationale

The aim of this project is to investigate the efficacy of cold plasma technology and electrolyzed/ionised water washing combined with appropriate packaging systems as effective phyto-sanitary measures. These technologies will be applied to different stone and pome fruits depending on applicability.

Methods

Fresh 'Granny Smith' apples (*Malus domestica*) were harvested at commercial maturity from the Agricultural Research Council (ARC) Elgin Research Farm, Grabouw, South Africa. Harvested fruits were transported in cool trucks from the farm to the Postharvest iQ Laboratory, ARC Infriutec-Nietvoorbij, Stellenbosch, where they were sorted upon arrival. Only mature, healthy and unblemished fruit were selected and stored at 0.5 °C without any pre-treatment for 3 months prior to investigation. In this study, the electrolyzed water (EW) was generated using the ELA-12 000ANW system (ECA Technologies, Envirolyte, South Africa). The EW obtained consisted of: available chlorine concentration (ACC) of 500 mg L⁻¹, ORP > 800 mV, and pH = 5.5. The SAI-EW was collected at low temperature (4 °C) and used immediately in the study. Food grade sodium hypochlorite (NaOCl, 11.5% M/V) solution was used as conventional control (industry practice), South Africa. All treatment solutions were diluted to desired concentrations prior to dipping the apples and non-treated samples were considered as control. Description of treatments and their abbreviations are presented in **Table 1**. After treatments, all the samples were stored at 5 °C and 90 ± 2% RH for 21 d and analyses were conducted in triplicate on days 0, 7, 14, and 12.

Key Results

Conclusion and Discussion

These findings suggest the potential of combining lower concentrations of SAI-EW with other hurdle techniques for a synergistic anti-fungal effect and better preservation of good apple quality attribute.