

Abstract

Heat Treatment is one of the most promising means for postharvest control of decay. It may be applied to freshly harvested produce in several ways: by hot dry air or by hot water rinsing and brushing. The 4th generation of the hot water rinsing and brushing (HWRB) machine, which was first introduced in 1996, is made from stainless steel materials to meet international food safety standards. The produce is pre-washed by non-recycled tap water over brushes to remove dust, chemicals and microorganisms. The produce is then rinsed with pressurized hot water at temperature between 48 to 63 °C for 10 to 25 s, depending upon produce type and cultivar. Fruits designated for the fresh-cut industry can be washed at 75°C for about 30 s before processing. Forced-air fans are used to dry out the produce before storing or processing. HWRB achieves its effect by interaction with both the pathogen and with the freshly harvested produce. The treatment physically removed fungal spores from the fruit surface, and caused cuticular wax to flow and partially or entirely seal natural openings in the epidermis. Fungal viability and the effective inoculum concentration were reduced. Sealing epidermal cracks with HWRB limited the sites of potential fungal penetration. The HWRB treatment induced the accumulation of proteins that cross-reacted with heat shock proteins and of proteins antibodies, indicating that HWRB also induces disease resistance on the molecular level in treated produce.