

diseases and pests, the treatment indirectly contributes to maintaining fruit quality throughout the postharvest handling and storage.

d) *Extends shelflife*

Hot water treatment can extend the shelf life of avocados by reducing physiological disorders such as chilling injury and delaying the onset of senescence. By subjecting avocados to controlled heat stress, the treatment can activate defence mechanisms within the fruit, such as the induction of heat shock proteins, which help in maintaining cellular integrity and prolonging fruit freshness.

e) Preventing rot development, chilling injury, browning and delaying ripening.

*Note: Hot water treatment should not be used when the avocado is harvested when it is over-mature or with serious bruises or mechanical injury.*



**Compiled by:** Ndambuki J.M., Wayua F.O.,  
Gathambiri C and Nyaga A.

**Edited by:** Wasilwa L.A. and Kirigua A.

**For further information, contact:**  
Food Crops Research Centre (FCRC)  
KALRO-Muguga,  
P.O. Box 30148- 00100, Nairobi  
Email: [fcrc.muguga@kalro.org](mailto:fcrc.muguga@kalro.org)

KALRO Call Center: 0800721741

**Design and Formatting:** Nyaola E. Nogrecia N.  
Odipo S. and Kibunyi N.

**KALRO/NAVCDP/Avocado Brochure No.  
188/2024**

## ENHANCING AVOCADO QUALITY WITH HOT WATER TREATMENT



## Introduction

Hot water treatment is used to kill fungal spores on the skin of the fruit and eradicate insects, bacteria and viruses. It is designed to enhance the quality of avocados by prolonging shelf life, minimizing postharvest losses, managing diseases, and preserving the overall quality of the fruit. The avocados should be immersed for 3-5 minutes in water heated to a temperature of 50°C followed by rapid cooling. Treatment of fruit using fungicides such as Bavistin (Carbendazim) and Sporta K Brochlura z improves the effectiveness of this treatment. This method is commonly used in the agricultural industry to mitigate issues related to pests, pathogens and physiological disorders.

## Principle

The basic principle of hot water treatment is that the treatment temperature should be sufficiently high to kill the associated pest/pathogen but not the host. The temperature should be controlled.

## Steps for hot water treatment

1. Harvest mature firm avocados (not overripe).



*Mature avocados ready for harvesting  
(Courtesy: James Ndambuki, KALRO)*

2. Wash the avocados.
3. Place them in hot water in a bucket at 50°C for 5 minutes.
4. After 5 minutes remove from the hot water and dip in tap water and wipe the water.
5. Pack the fruits in a cardboard ready for export at a temperature of 5°C.



*Packed avocado ready for export  
(Courtesy: Charity Gathambiri, KALRO)*



*Packed avocados stored at 5°C  
(Courtesy: Charity Gathambiri, KALRO)*

## The importance of hot water treatment

- a) *It controls postharvest diseases such as anthracnose and stem rot*

Avocado fruits are susceptible to various postharvest diseases caused by fungi such as anthracnose (*Colletotrichum* spp.), stem end rot (*Lasiodiplodia theobromae*) and other pathogens. Hot water treatment effectively controls these diseases by killing or inhibiting the growth of pathogens present on the fruit surface or within superficial tissues. Exposure to high temperatures during hot water treatment helps to eradicate pathogens, thus reducing the risk of postharvest decay.

- b) *Controls insect-pests*

Avocado fruits are susceptible to postharvest pests such as fruit flies and thrips. Hot water treatment can help in controlling these pests by either killing them directly or disrupting their developmental stages. This method is particularly useful for meeting quarantine regulations in international trade where certain pests need to be controlled to prevent their spread to new regions

- c) *Quality preservation*

Maintaining fruit quality is crucial for consumer acceptance and marketability. Hot water treatment can help preserve the quality attributes of avocados by minimizing weight loss, reducing postharvest physiological changes, and preserving sensory characteristics such as flavour, texture, and colour. By controlling