

Promotion of postharvest disinfestation of key horticultural crops in Kenya and Uganda

Preamble

Mango, avocado, French beans and bell pepper are economically important horticultural food and cash crops in sub-Saharan Africa, benefitting millions of growers, majority being smallholders. In Kenya and Uganda, these crops are of socio-economic significance, in that they offer employment opportunities for women and youth – who make up over 80% of the agricultural labour force – and provide essential nutrients for the communities. Despite these qualities, production of the crops is constrained by several insect pests, chiefly fruit flies, thrips, and false codling moth. Not only do these pests cause yield losses of between 60-90%, they also restrict access to regional and international export markets for affected crops as they are classified as quarantine pests.

One of the requirements by many importing countries is that fresh produce be subjected to postharvest dis-infestation quarantine treatment, to ensure that the risk of introducing unwanted pests is minimised or eliminated. The international acceptance threshold for presence of quarantine pests has been set at 99.9968% (Probit 9), which allows only three survivors out of 100,000 individuals after the quarantine treatment. Implementation of postharvest cold/hot water treatments can ensure quarantine security, and enable target countries to regain access to lucrative export markets.

Several postharvest treatment options have been in use over the years, notably fumigation using methyl bromide and ethylene dibromide to dis-infest agricultural produce against insect pests. However, some of these fumigants have been banned in many countries as they are toxic to humans, and contribute to depletion of the ozone layer. Other treatment technologies, such as controlled atmosphere storage, are cost intensive.

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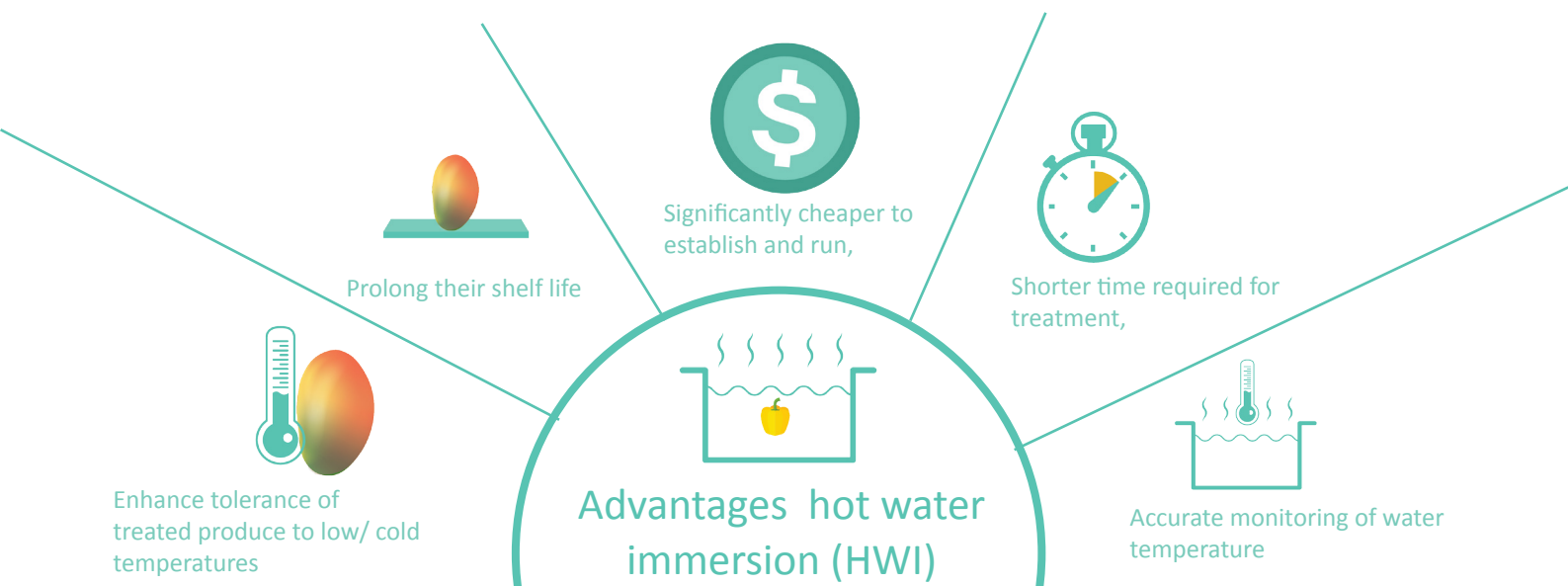
99.9968%

The international acceptance threshold for presence of quarantine pests

The technology

Non-toxic and affordable approaches involving use of heat regulated postharvest treatment, which includes vapor heat (VH), forced hot air (FHA), and hot water immersion (HWI) are available. Compared to the other two, HWI has distinct advantages including shorter time required for treatment, ease of implementation, and more accurate monitoring of water temperature. HWI has also been found to enhance tolerance

of treated produce to low/ cold temperatures, and prolong their shelf life. It delays ripening/ softening of produce and eliminate other microbes that hasten product deterioration, thus improving postharvest quality. HWI is significantly cheaper to establish and run, making it a sustainable option for small-scale agripreneurs with limited resources.



Local and regional benefits



A regionally harmonized postharvest hot/cold water dis-infestation treatment protocol for fruit and vegetable processing for export.



Postharvest hot water disinfestation adapted for bell pepper against false codling moth.

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