CHAPTER 4

Where Contamination Can Occur in the Supply Chain

Overview

Contamination of produce with food safety hazards can occur at any step in the supply chain, from planting the crop to delivery to the end customer.

Preparing a flow chart of the supply chain process steps will assist the business to identify potential sources of food safety hazards. Contamination sources which could affect your produce may be physical, chemical (including allergen) and/or microbiological hazards.

Examples of fresh produce supply chain process steps and the inputs which could contain food safety hazards are outlined in Figures C4.1, C4.2, C4.3 and C4.4. The actual process steps and their order will vary depending on the type of produce and business. Chapters 5 to 16 provide good practice guidelines for managing the inputs and potential hazards.

Inputs that should be considered and managed include:

- fertiliser and soil amendments [Chapter 6]
- water used in irrigation, chemical applications, cleaning, processing and storage [Chapter 7]
- chemicals [Chapter 8]
- containers and packaging materials [Chapter 11]
- planting materials [Chapter 15]
- allergens [Chapter 16].

Food safety hazards that are required to be managed may also be associated with:

- the growing site and surrounding land uses [Chapter 5]
- weeds [Chapter 5]
- facilities and infrastructure [Chapter 9]
- equipment and tools [Chapter 10]
- vehicles [Chapter 12]
- pests, animals and birds [Chapter 13]
- people [Chapter 14].

Food safety hazards can also be present and contaminate produce during wholesale and retail handling and display of fresh produce. These hazards and their potential risk during that part of the supply chain are not considered within the scope of this document.

Produce can become contaminated with food safety hazards at any step in the supply chain.

4.1 Potential sources of contamination in crop production

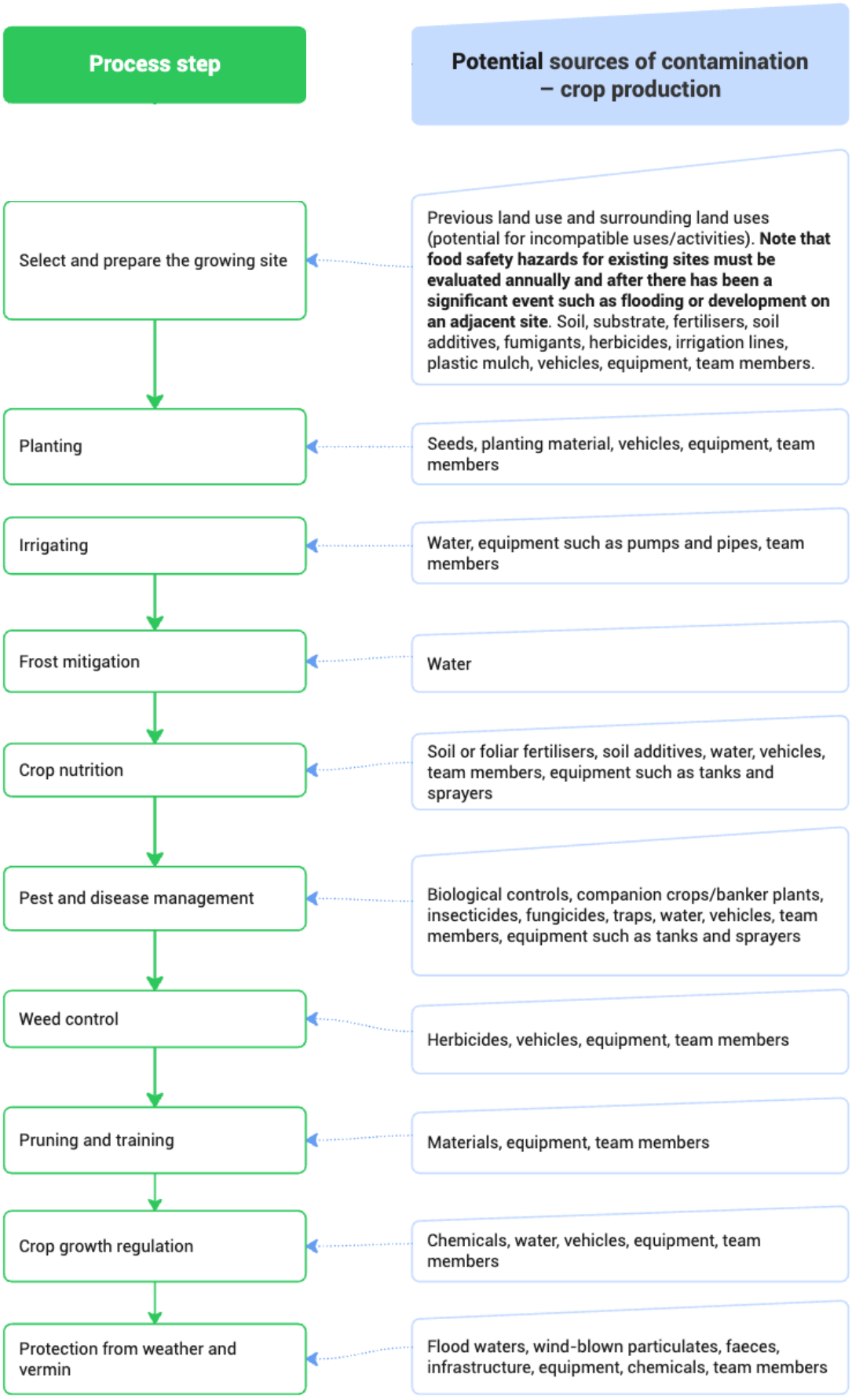

Figure C4:1 | Process steps during crop production and potential sources of contamination.

Image C4:1 | Plastic mulch can reduce soil contact and suppress weeds, but if not properly managed can be a source of physical contamination (foreign body).

Image C4:2 | If not properly managed, hydroponic systems can spread microbiological contamination via recirculated water.

Image C4:3 | Overhead irrigation (sprinklers) can directly wet edible portions of the crop, increasing the likelihood of contamination if water quality is not adequately managed.

4.2 Potential sources of contamination in harvest and field packing

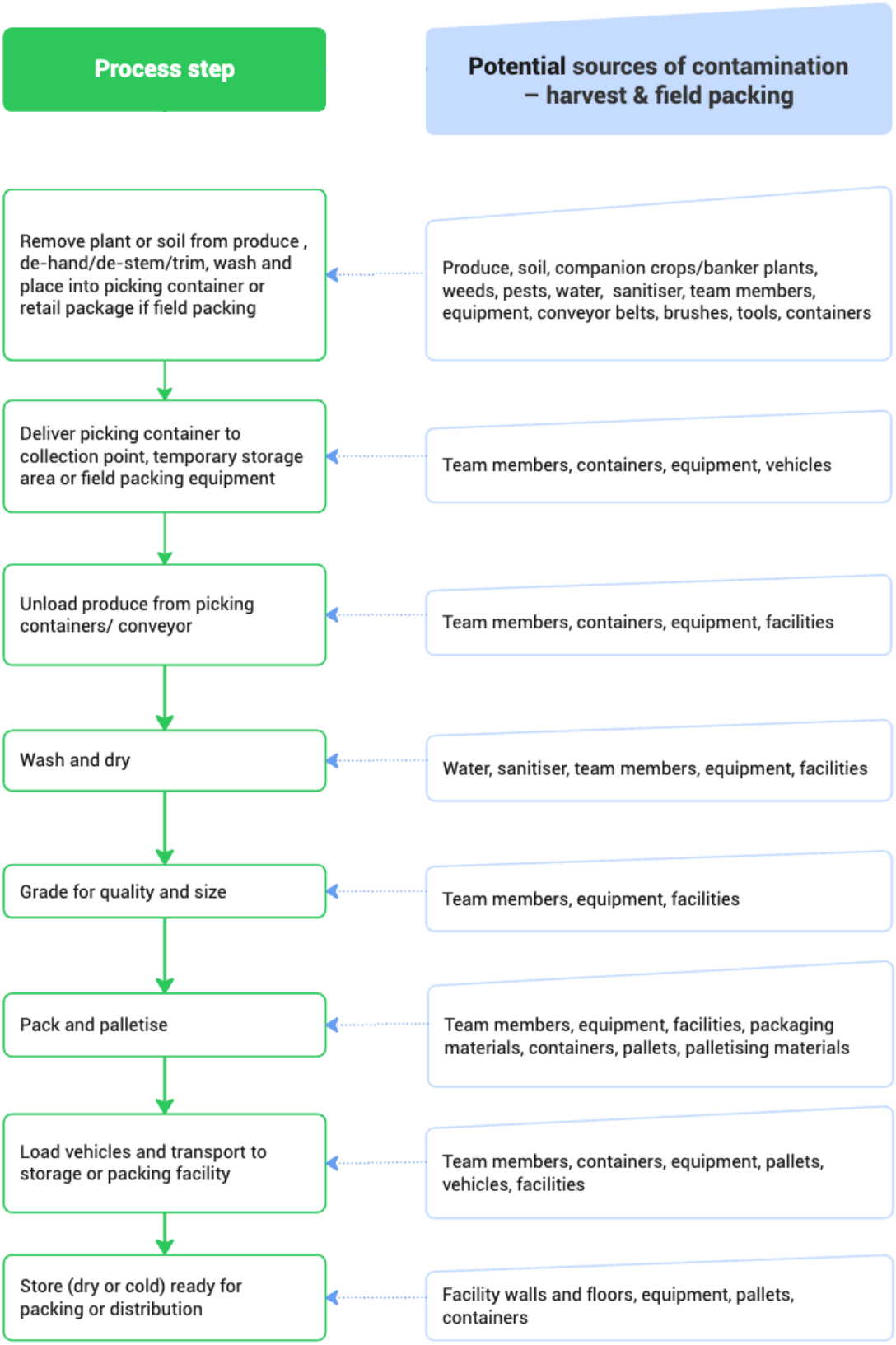

Figure C4:2 | Process steps during harvest and field packing and potential sources of contamination.

Image C4:4 | The hands of harvesting team members can pose a risk of microbiological contamination. Hands should be thoroughly washed with potable water, dried with a single use paper towel and sanitised before commencing work and after any activity that may compromise hygiene including toilet use, nose blowing, coughing or sneezing, eating, smoking, handling waste, performing maintenance tasks or taking breaks.

Image C4:5 | Harvesting containers can become a source of potential physical, chemical (including allergen) and microbiological contamination. Containers that come in contact with fresh produce should be food-grade, sourced from approved suppliers and kept clean and sanitary.

4.3 Potential sources of contamination in packing and storage

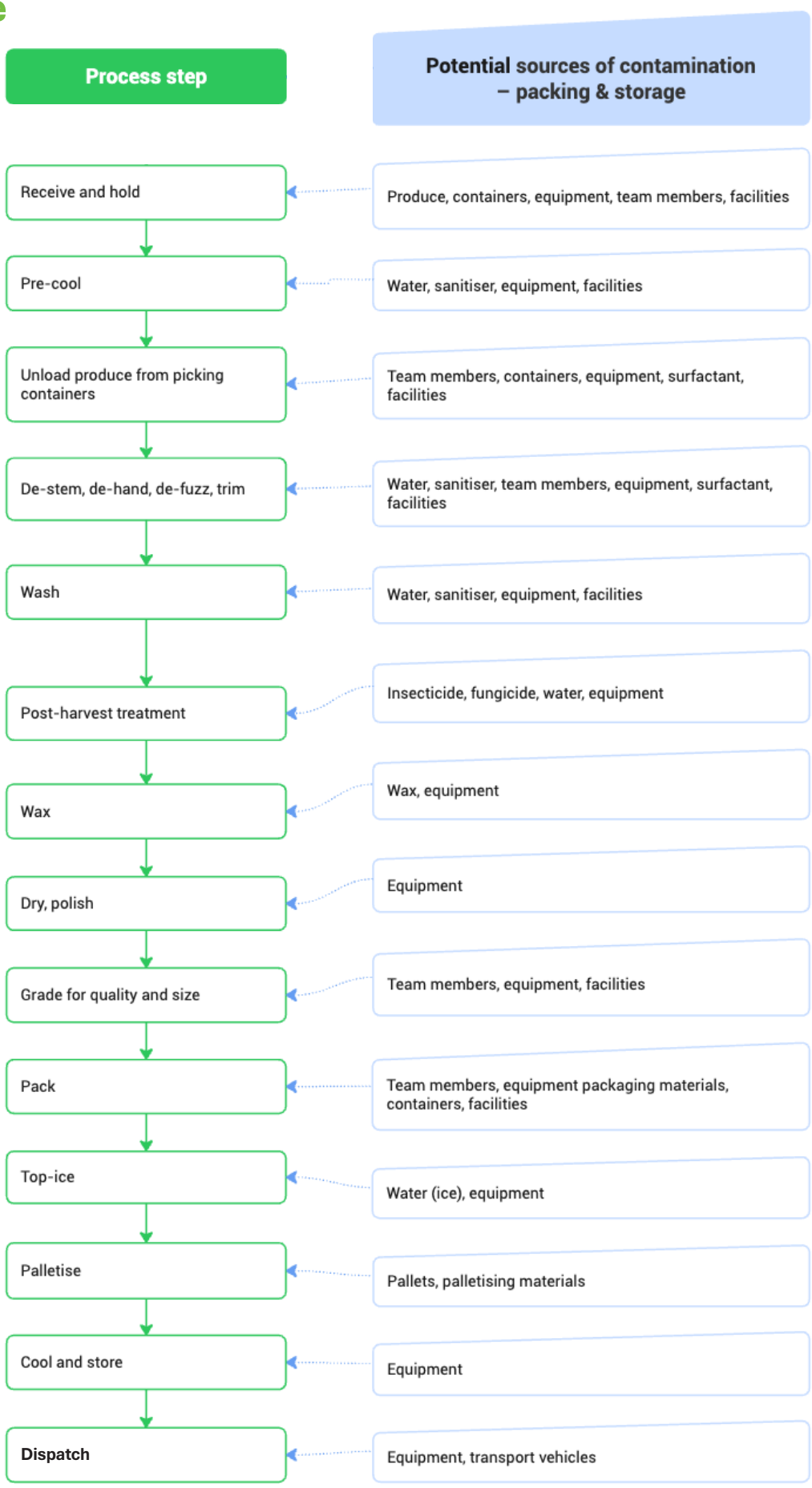

Figure C4:3 | Process steps in a packing and storage facility and potential sources of contamination.

Image C4:6 | The use of appropriate personal protective equipment (PPE) is essential for minimising physical and microbiological contamination risks posed by team members operating within packing and storage facilities.

Image C4:7 | Packaging materials used for fresh produce should be sourced from approved suppliers and where possible, hold recognised Global Food Safety Initiative (GFSI) certifications, such as Safe Quality Food (SQF) or Brand Reputation Compliance Global Standards (BRCGS).

Image C4:8 | Transport temperatures for fresh produce should be consistently maintained across all stages of the supply chain. Temperature verification should be conducted using monitoring devices such as data loggers.

4.4 Potential sources of contamination in distribution

Process step	Potential sources of contamination – distribution
Load/dispatch	Facilities, equipment, team members
Transport	Vehicles, other products
Unload/receive	Equipment, team members, facilities
Quality inspection	Equipment, team members
Re-grading (due to rots, damage, weight loss, carton damage, etc)	Facilities, equipment, team members
Storage	Facilities (water if humidified)
Ripening/conditioning	Facilities
Phytosanitary treatment	Facilities, chemicals
Order picking/restacking	Facilities, equipment, team members
Load/despatch	Facilities, equipment

Figure C4:4 | Process steps distribution and potential sources of contamination.